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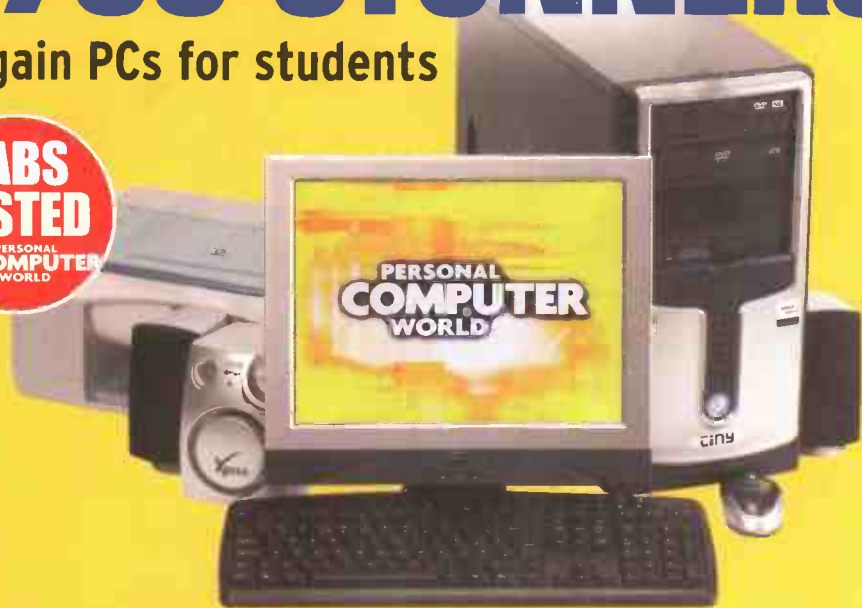
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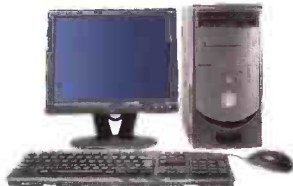
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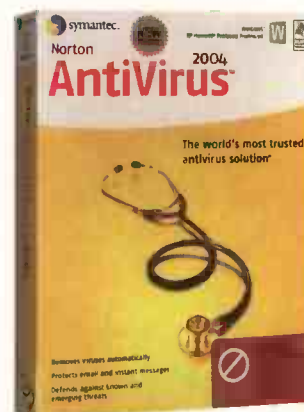


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Let us show you what sort of deals can you get for less than £800 inc VAT

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Make sure you're protected from threats by choosing a package carefully

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Competitions

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Turn to page 208 for a chance to win one of five broadband subscriptions, or one of two Sony SDM-S94 monitors



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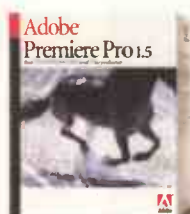
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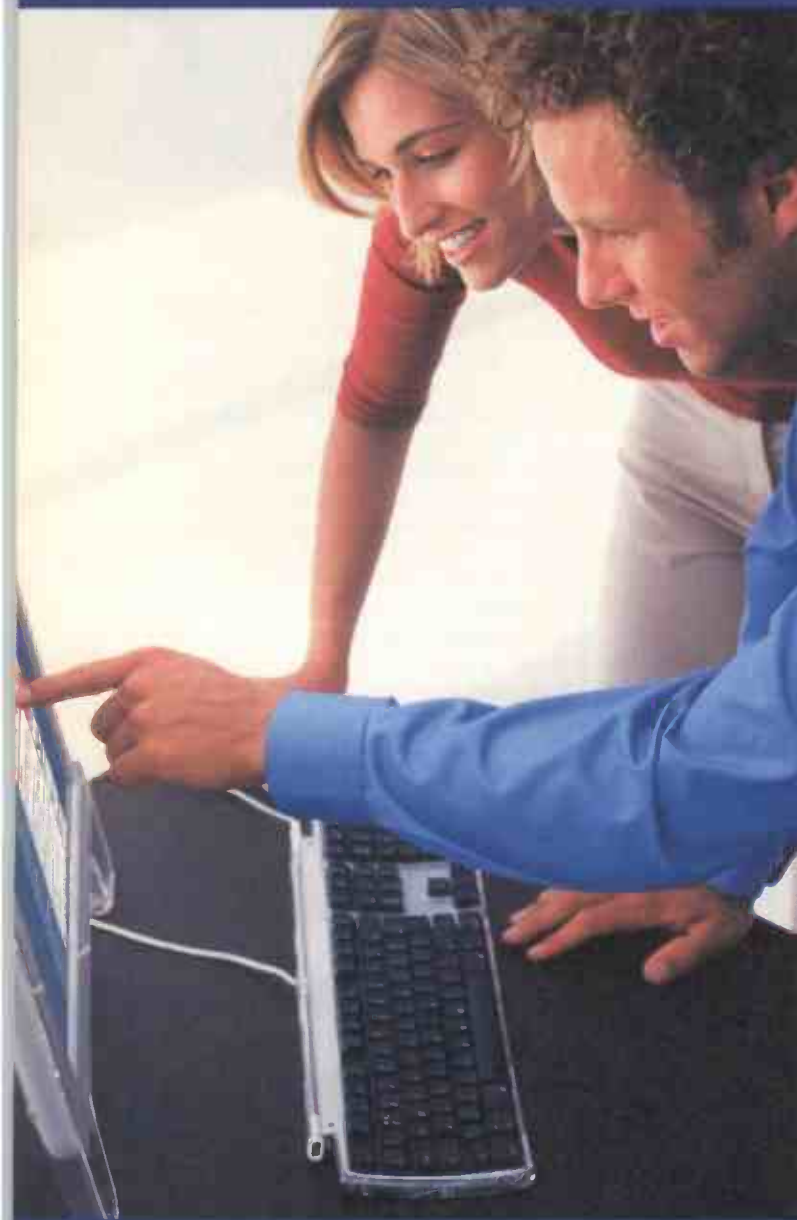
Use your monitor as a TV, find out how in this month's Hardware column p169



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rob_jones@vnu.co.uk

Protection is the name of the game

XP Service Pack 2, like anti-virus packages, cannot be ignored, warns Rob Jones



» **Protect your PC**
Find out how free and paid-for anti-virus packages compare – see page 131



» **Graphics in depth**
From resolution and anti-aliasing, to bump mapping and PCI Express, we explain graphics cards in detail – see page 87

This month Windows XP Service Pack 2 comes out; an important release for anyone running the current version of the operating system. It includes a number of new features and, importantly, it is far more security aware than the previous version of XP, as part of Microsoft's attempt to better combat the constant threats computer users face.

As any long-term Windows user knows, there is an air of inevitability that surrounds the operating system's updates; you can't really ignore them, but that doesn't stop you being frustrated at having to go through the process, or angered over the fact that, yet again, Microsoft's software seems to have been shipped full of holes.

So to an extent, you could say 'about time' to XP Service Pack 2 and, with some of its security updates, I don't think that many in Microsoft would disagree (for details see page 17). XP is a good operating system – in my opinion the most stable it has shipped so far for the desktop, and a vast improvement on previous releases. Sure Mac, Linux and Unix advocates will prefer their personal choice, believing it is superior, but millions of XP users don't care, because they're happy to stick with what they know.

Their needs are simple – their system switches on, works and helps keep them safe from viruses out in the wild. And that was where the current XP fell down, because it assumed that the average user would put in the effort to secure their system. It's all too easy to scoff at the naivety of those who do nothing to protect their computer, but many people are still unaware of firewalls or the regular Microsoft updates. Even if they are, how many meticulously install Windows updates whenever they ship? Do you?

Next month we plan to bring you a more detailed look at Service Pack 2, evaluating its newest features and what improvements, if any, it introduces. But whatever your opinion of XP, if you run the operating system, this is a must-install release and one not to be ignored.

On the anti-virus front, we have a group test of eight packages this month (page 131), ranging from those that are freely available, to the paid-for versions. And before you put your hands in your pockets, you might be surprised at just how well the free AV software performed.

But like Windows and its many updates, there is an air of inevitability about needing anti-virus software and, though we say it time and again, it never ceases to surprise how many people either forget or don't know that they must regularly install the latest updates.

Finally, as for innovations within *PCW*, we have introduced two ebooks over the past couple of months.

Hopefully, you'll have now tried our Buyer's guide ebook on the cover disc. It gives you decision-making advice on a number of technology areas, plus detailed feature listings for almost 6,000 products available to buy across those categories. We'll keep working on the Buyer's guide, adding more categories and improving the product search facility.

We now have an interactive ebook version of the magazine itself available as well, from Zinio (www.zinio.com). July's issue is up as a free sample (don't worry if it looks like you have to pay, it is free), found at www.tinyurl.com/2lhtq. But be aware, if you try and download August's, you'll be charged \$5.99.

We'd be interested in your comments and feedback on this medium as a way of reading the magazine. It has all the same articles (and ads) as the paper version, but any links are clickable, taking you through to the website or online article mentioned.

'It's easy to scoff at those who don't protect their computer, but many are unaware of firewalls or updates'

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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.

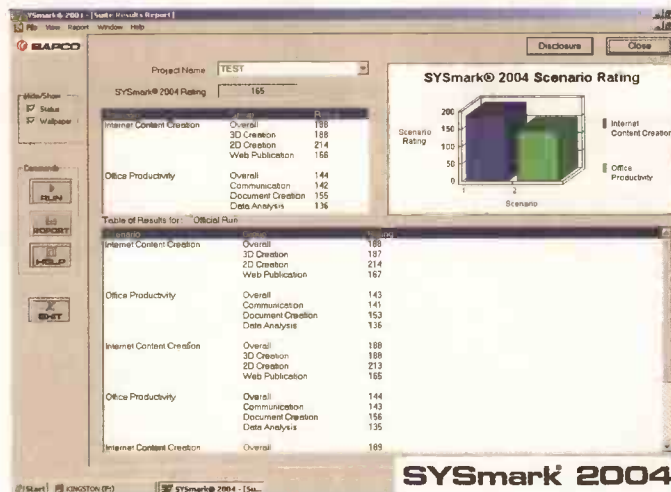
A score of 100 indicates that the system has a performance equal to the reference PC, 200 indicates twice the performance and so on. We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category.

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.



Sysmark 2004 tests system performance by running popular applications

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.

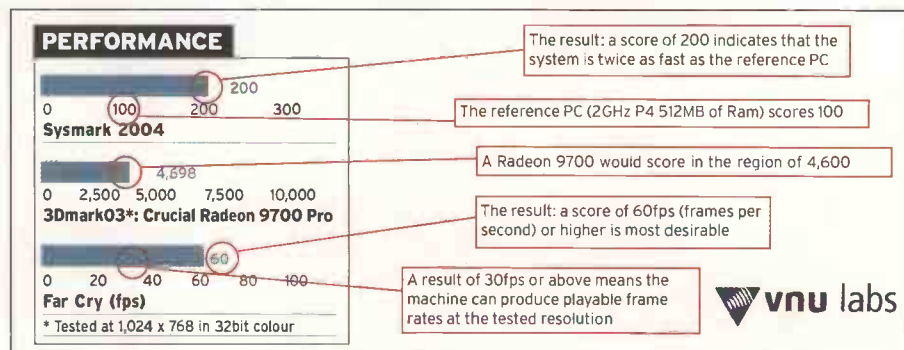
See www.bapco.com for pricing information and full details of testing strategies and methodologies.

3DMARK 2001

This algorithmic DirectX test runs three specially coded games, based on the Max Payne engine, at low and high detail. A fourth test only runs on cards that are fully compliant with DirectX 8. This results in higher scores being achieved by these cards than others.

The benchmark is run at its default settings of 1,024 x 768 in 32bit colour. When testing graphics cards, it is also run with full scene anti-aliasing (FSAA) and at 1,280 x 1,024, both in 32bit colour and textures, set to loop three times.

The result is calculated through a combination of the average frame rates for the first three games in both high and low detail, with greater emphasis put in the high detail. The result of the fourth test is then added to this – it has less of a bearing on the overall score.





Far Cry is a real challenge for modern graphics cards



PCmark04 measures memory, processor, graphics and hard drive performance

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 in the same way as in 3Dmark 2001; 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. As there are still some systems without this functionality, especially notebooks, we will be retaining 3Dmark 2001 as a standard graphics test where 3Dmark 2003 will not run.

FAR CRY

Far Cry is the new game from Ubisoft we use 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.



3Dmark03 is so demanding it will only work on the latest cards



3Dmark 2001 tests DirectX 8 performance

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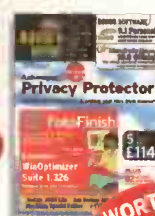
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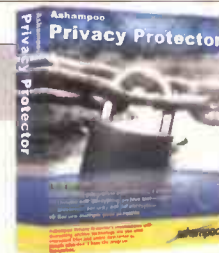


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Sun chief McNealy
(left) looks beyond
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for Java markets.



- 20 Voice calls move to web...
give or take a few problems

64bit Intel PC chips ship

Intel has launched its first 64bit chips capable of running classic x86 PC code natively – unlike the company's high-end 64bit Itanium, which uses a different instruction set. They are said to be 30 per cent faster than their predecessors.

The technology is expected to migrate to Prescott-generation P4 processors within a few months.

The new Xeons, codenamed Nocona, are widely seen as a bid to head off the challenge from AMD's Opteron and Athlon64 chips. Like them it supports both 32bit and 64bit operation. The main benefit for users is a bigger address space.

Intel was slow to go 64bit with its x86 line for fear of competing with its own Itaniums, sales of which have been less than spectacular. But it says the new Xeons will not be competing in the same ultra-high-end market.

The Nocona Xeons will come in 2.8GHz, 3GHz, 3.2GHz, 3.2GHz, 3.4GHz and 3.6GHz flavours costing between \$209 (£115) and \$851 (£468) apiece in bulk. They use an 800MHz front-side bus (FSB) and support DDR2 memory and the PCI Express bus with the aid of a new E7325 chipset with a bulk price of \$100 (£55).

HP was the first to announce systems based on the new chips. Prices of its xw6200 and xw8200 workstations will start at £1,259 and £1,620 respectively. Intel says Noconas will be used in a new generation of dual-processor servers in the next few months using two new chipsets, the E7520 and the E7320, and the IOP332 I/O processor.

Intel also announced the first 90nanometre Pentium M chips. The 715 and 725 processors (7xx means high-end under Intel's new numbering system) operate

at 1.5GHz and 1.6GHz and cost respectively £115 and £133 in bulk. They have 2MB of Level 2 cache and use a 400MHz FSB.

There are also three new chips in the entry-level 3xx series. The Celeron D 335, 330 and 325 clock 2.53GHz, 2.66GHz and 2.8GHz and respective bulk prices are £43, £49 and £64.

The trio use a 533MHz FSB and a modest 256kB of L2 cache, and do not support Hyperthreading. But they can use the latest Grantsdale or the older 845 chipsets.

The announcements came days after the launch of chipsets supporting PCI Express, and five new 5xx P4 chips clocking up to 3.6GHz, as part of what Intel says is the biggest change in the PC platform for a decade.

● Is the Apple G5 really faster than any PC? – see page 31

BT switches to all-IP and pilots fibre to the home

BT is to move its entire phone system to Internet protocol (IP) over the next five years, merging voice and data links into a single system. By 2009 most subscribers will have what BT calls a 'broadband dialtone' that can be activated simply from the exchange.

Subscribers who wish simply to stick with their old analogue telephones will not notice any difference; ADSL-style filters will still be needed if you want to use both systems side by side. But the system, which BT is calling its 21st Century Network (21CN), is sure to accelerate the use of voice over IP (VOIP) and force the industry to address several unresolved issues (see page 20).

The switchover will begin in 2006 after extensive trials at 20 exchanges. It will replace today's mix of several systems using a variety of technologies. IP makes more efficient use of lines than



Phone of the future? Windows CE-based Samsung Anyweb IP phone

traditional switching because it allows many data streams to use one line.

Potentially more exciting is that, as part of what BT calls its 21st Century Network (21CN) project, it is piloting the use of fibre to link exchanges to homes – replacing a bottleneck with a pipe of near limitless capacity. The two big cable companies,

NTL and Telewest, currently take fibre only to the kerb, with copper coax cable running into the home – a legacy from pre-Internet days when fibre was seen as a TV-delivery channel.

Former Alcatel chairman Peter Radley, an adviser to the DTI's Foresight Project, said in May that copper will not be able to cope with future needs when desktops will require links 200 times faster than today's.

Radley said at the Foresight launch that the demand on local networks will be 'up to 30 terabits, the equivalent of the whole of the US Internet today' (see PCW August, page 29).

But BT stresses that its pilot fibre scheme – involving 1,500 homes at Martlesham Heath, Suffolk; Milton Keynes and London's Silvertown – does not mean it will switch from copper completely. 'The plan is to do it in new build areas,' a spokesman

said. This is ironic, as BT was one of several firms endorsing the promotion at the Ideal Home exhibition of a company promoting Wifi as a cheap alternative to putting fibre round homes (PCW June p16).

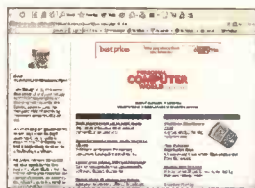
Regulators constrained BT for years from moving into cable. Any large-scale BT deployment of fibre-to-the-home would put cash-strapped cable companies in a difficult position, as keeping up would be a huge investment.

But so would an infrastructure capable of carrying and routing the kind of traffic envisaged by Radley, which would enable routine use of high-quality video calls.

BT Wholesale chief executive Paul Reynolds said the company is investing more on its network than the Government plans for the roads. He added: 'We are building the nervous system of our economy.' **Clive Akass**



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Acer's media PCs
Find out about the latest developments in the company's product range – see page 33



XP mega-upgrade ships

An imminent launch date for Service Pack 2.0, the long-awaited free major upgrade to Windows XP, was expected to be announced as we went to press.

SP2 is a must-have for all XP users but at 80MB or more it is a hefty download, especially if you use dial-up. The good news is that it will be available on CD for PCW readers. Check out our website for details.

The new code is likely to be the biggest change in Microsoft's

flagship operating system before the next generation, Longhorn, is launched, which will be late next year at the earliest.

It is far more than the usual service-pack aggregation of bug fixes, but most of the changes do tighten up XP security. They include:

- New memory protection. Several techniques are used to prevent 'buffer overrun' attacks in which rogue code spills into memory and is executed. One measure exploits the NX (no-

execute) feature on the latest AMD processors, which separates code and data in memory.

- An enhanced firewall is turned on by default and closes all unused ports to block intruders.
- Email quarantine. Potentially unsafe attachments are isolated.
- Safer surfing. More protection against malicious scripts and dodgy downloads.

Other new features include a pop-up manager and improved handwriting recognition for Tablet PCs.



Versatile TV

Toshiba's stylish (if not stylishly named) 17WLT46 doubles as a PC display and 16:9 TV with twin 6w Nicam speakers. It lets you watch two channels at once – and, unlike some LCD TVs, allows you to watch TV in a window as you work at your PC. It will cost around £800. www.toshiba.co.uk

Google faces \$100m assault by MSN

Microsoft has revamped its MSN search engine and Hotmail email service as part of a \$100m assault on rival Google.

A major snag of Hotmail was that your account could cease to function as it became clogged up with junk mail. Google earlier this year launched a rival free Gmail service giving each user 1GB of storage.

Yahoo quickly offered its users 100MB of storage. Now Microsoft has responded by giving Hotmail users 250MB, plus free anti-virus scanning and the ability to send

or receive 10MB attachments. Spam filtering has already been improved. Users of the premium Hotmail Plus service, costing £14.99 a year, will get 2GB of storage and a 20GB attachment ceiling.

The MSN search engine, long overshadowed by Google, has been revamped so that it clearly separates sponsored and unsponsored links – an issue over which search engines have been much criticised.

Perhaps more likely to pull in the punters is a facility that

trawls more than 4,000 up-to-date news sources – a feature that until recently could cost thousands. The new engine also allows you to search Microsoft's Encarta Encyclopedia.

Google is a comfortable leader in search-engine stakes with 48 per cent of hits, Yahoo is second with 20 per cent, MSN third with 14 per cent, and AOL trails with seven per cent, according to a survey by Insight Express.

- Windows CE goes 'open source' – see page 18
- .Net versus Java – page 30

Red alert

You can check your credit rating if you sign up for a free trial of a credit-monitoring service at www.creditexpert.co.uk.

PCs outslack users

PCs are taking more 'sick days' than their owners – because there is too much spam in their diet, according to Yahoo Mail in a survey of 2,500 of its UK users.

The study found that PCs are out of use for 49 hours – that's more than six days – a year as their owners deal with spam. Another three days are lost due to virus attacks.

The average UK worker takes five sick days a year, says the Confederation of British Industry.

Sony launches 'pro-am' videocam and Ipod rival

Sony describes this DCR-HC1000 videocam as 'prosumer', because it is said to give amateurs who can fork out £1,300 the quality of professional TV cameras. The device has three sensors for capturing RGB colours, a Carl Zeiss Vario-Sonnar T lens, and image stabiliser technology to maintain a steady picture when shooting handheld.

Its new £1,100 compact stablemate DCR-PC350 has a 3megapixel CCD and a Zeiss Vario-Sonnar T* lens system with a 10x optical zoom. A docking station



provides charging and a Firewire port for connection to PC or DVD recorder.

Sony is set to launch a rival to Apple's Ipod music player called the Network Walkman HD1, which will include a 20GB hard disk and cost around £220. It will

convert tracks to Sony's Atrac 3 format in an apparent effort to boost the popularity of Sony's online music store. www.sony.co.uk



'Trust my PC to take a sickie when the World Cybergames are on.'



Insect eye lets bank cards 'see'

German researchers have made a camera less than half a millimetre thick that mimics the compound eye of insects and could enable bank cards to reject dodgy users. It is an array of micro-cameras, each with a lens focusing on a single pixel as pictured above.

The resolution is poor, but Fraunhofer Institute for Applied Optics researchers say it is enough for image recognition. A suggested use is as a dashboard sensor that sounds an alert when a driver starts falling asleep.

www.microoptics.org

Comdex falls

Comdex Fall has been called off this year because of a lack of support, says organiser Medialive. Many wrote it off after a poor showing last year but Medialive insists that it will return in 2005.

It is unlikely to regain its former status as the world's premium IT show. Companies began pulling out years ago in favour of smaller specialist shows. Others, complaining of inflated show charges, simply set up in nearby hotels and invited in press and potential customers. Then convergence caused a drift to the Consumer Electronics Show, also held in Las Vegas.

Orange 3G card

Orange has launched a 3G data-card, with 3G video handsets from Sony Ericsson and LG to follow later this year. Vodafone launched a similar card earlier this year but Orange claims its 3G service will offer greater coverage and international roaming. Vodafone 3G is today available in the M4 corridor and 11 cities including London.

Itunes bell tolls for video

Record shops are not the only high-street traders fearing for their future with the UK launch of Apple's iTunes online music shop. Video stores know they are next in line for change – and it may happen quicker than they expect.

Just days after the iTunes launch video chain Blockbusters announced a new DVD delivery service – using the old steam post. A spokesman said: 'We do not think the time is ripe for online delivery.'

Apple claims 800,000 tracks were bought from its iTunes European site within a week of its opening in June, and legal and illegal online distribution is blamed for plummeting CD sales.

Online video distribution has yet to reach that scale, despite

the spread of broadband, but few doubt that it will sooner or later; retailers like Blockbusters will be hardest hit when it does, unless they change their act.

Blockbusters is certainly looking at alternatives, such as video-streaming, according to a spokesman. But he added: 'There is not a big enough market yet.'

However a new delivery channel is opening up almost unnoticed with the linking of satellite and cable boxes to personal-video recorders (PVRs) with massive storage.

A single satellite transponder can deliver 40Mbits/sec, enough to deliver the equivalent of a DVD in a few minutes. Cable companies can push out similar speeds by aggregating channels. So, theoretically, it would be

possible for the top 30 movies to be delivered during the slack hours of the night when most TV channels close down.

This is not to say Blockbusters is wrong in its assessment of the current market: both users and the industry could take time to latch on to the possibilities of PVRs, and more than one company has gone bust trying to introduce electronic distribution too early.

The Blockbusters system looks a good stopgap. For £13.99 a month you can keep a changing selection of three DVDs at any time. There are no due-back dates: you get your next chosen DVD by first-class post as soon as you return an earlier one. New ways are not necessarily better than old.

Clive Akass

www.blockbusters.co.uk

Microsoft opens source to fight Linux

Microsoft is allowing developers more scope to exploit the source code of Windows CE in a move clearly aimed at outflanking the challenge from Linux.

Variations of CE are used in a wide variety of devices from smart phones to point-of-sale-systems. It is most common in devices doing a narrow set of tasks, a class of work for which Linux can most easily compete because it can be preconfigured by experts.

Access to CE source code has previously been limited to certain developers for non-commercial purposes. But with the release to manufacture this month of the latest version, CE



Source code will help manufacturers tailor CE better to devices such as the Hitachi phone-enabled PDA (below left). The Photoloom (left), a dynamic picture frame that can screen images from a Wifi-linked PC, is the kind of narrow focus application for which Linux is a more immediate competitor to Windows CE.

www.photoloom.com

5, Microsoft has announced a two-tier program for what it calls commercial derivatives.

All developers get access to 2.5 million lines of code; typically this would be exploited to tie the operating system more tightly to a particular device.

Developers selling less than 5,000 'runtimes' – Windows CE code tailored for a particular task – are free to sell the altered code and retain ownership of it.

Microsoft claims this puts CE ahead of Linux, with which all kernel modifications are available to anyone.

But the case is altered for 'premium' developers, selling more than 50,000 runtimes,

who get access to more source code but only six months of exclusive use of modifications – after which Microsoft has the option of including them in the operating system. This seems to mean Microsoft will own any changes that it likes.

Karen Carter, embedded-devices group product manager at Microsoft, said: 'Everyone can now go and innovate. We are very excited about the possibilities.'

The new version of Windows CE, codenamed Macallan, is said to be faster with improved driver support out of the box, better graphics for gaming devices, and support for remote monitoring.



Spyware robs and crashes

Spyware monitoring keyboard activity is the cause of a massive rise in thefts from online accounts – and a host of other problems, industry analysts say.

Most PCs harbour at least 30 pieces of spyware, much of it for relatively innocent purposes such as marketing. But, according to Microsoft, it causes more than one in two Windows crashes and users rarely spot it as the source of their problems.

Spyware-related support calls amount to 12 per cent of those to Dell in the US and cost millions.

Analyst Gartner reckons that unauthorised use of online

accounts has become the the fastest-growing fraud in the US, where 1.98 million users have lost a total of \$2.4b in a year.

Gartner research director Avivah Litan said in a statement: 'In most cases that are not inside jobs, thieves likely stole account numbers and passwords to get into accounts online or through telephone banking services. Neither method involves face-to-face transactions.'

Litan added: 'Banks must implement stronger access controls to online and telephone banking systems.'

Spammers have taken to distributing spyware to collect

information to help them target junk email and prime it with a subject line likely to catch a user's attention, according to the email security specialist Message Labs. But some sites dump spyware on the hard disk of any visitor.

The BBC reported last month that online fraud is reaching epidemic proportions, with the famous Nigerian 419 scam letters giving way to cons based on spurious prize offers.

One man with a son suffering from leukaemia was said to have parted with £16,000 in 'fees and taxes' after being told he had won €500,000 in a 'lucky day' lottery.



>> Tag party

Avery Dennison's £129 ex VAT label printers can be used to address envelopes as well as put designs and text on stick-on labels. www.avery.co.uk

>> Burn direct

HP has announced a new disc labelling system that enables you to burn silkscreen-quality labels directly onto optical media. Lightscribe Direct Disc Labeling uses a modified disc drive with an extended-range laser to burn images onto proprietary discs that are coated with a light-sensitive chemical.

Users create a CD as normal, flip it over in the drive tray, and Lightscribe etches a permanent label onto its surface. HP intends to license the technology to various manufacturers of CD and DVD drives, with finished Lightscribe-enabled hardware and compatible disc burning software scheduled to ship in the second half of 2004.

www.hp.com

www.pcw.co.uk/News/1156448

>> DIY laptops

UK system builders could start to build their own notebooks with the announcement by distributor Ingram that it is to start selling barebones models made by AOpen.

The Taiwanese vendor is the first to offer a notebook chassis similar to the barebones PCs that leave users to choose and install major components. Notebooks are trickier and most of those sold in the UK are put together in the Far East and rebadged here.

Ingram sells to dealers rather than end users and expects its clients to assemble and sell whole notebooks rather than the barebones chassis and components.

MPs call for tougher line on hackers

The maximum sentence for hacking should be increased from six months to two years and denial-of-service attacks specifically outlawed, says an all-party group of MPs looking at ways to tackle cyber attacks.

Harsher sentences would help deter hackers and would make hacking an extraditable offence – meaning that, say, a German offender could be charged in Britain for unauthorised access to a computer in this country.

They would also mean crown prosecutors would be more likely to take cases to court, according to the All Party Internet Group

(known by the unfortunate acronym Apig, a name the hacking underground will doubtless enjoy taking in vain).

Banks and gaming sites will be encouraged to take out private prosecutions against offenders to compensate for a lack of police resources and know-how.

Apig chairman Derek Wyatt, Labour MP for Sittingbourne and Sheppey, said local police forces might consider trying to recruit IT experts as special constables to fill the skills gap. 'We are seriously out of our depth here,' he said.

The group hopes a Bill will be tabled in the autumn,

to revise the 14-year-old Computer Misuse Act. Other online abuse – such as 'phishing' for bank details, premium-line scams and email cons – will be covered where necessary by a new Fraud Bill.

The MPs know net abuse can be tackled only by international action. Brian White, treasurer of Apig and Labour MP for NE Milton Keynes, said: 'It is already starting to happen.'

Alan Lawson, research analyst at Butler Group, said the proposed increased sentences for hacking were not strong enough to deter 'significant illegal activity'.

A surfeit of Wifi?

Intel is fond of telling us how notebooks are great for pushing up productivity. No need to slack on the train home when you can take out your trusty laptop and work on your sales figures. You can even tap away at a spreadsheet on the toilet, using Wifi to reach the office network.

Now Intel has put a Centrino notebook into a surfboard. So rather than just paddling about, soaking up the sun, waiting for that next big wave and generally wasting your time, you could be catching up with the office email via a beach Wifi hotspot.

The board was built for Devon's Intel-sponsored Gold Coast Oceanfest which was held in June. It certainly adds new meaning to the term 'surfing the web'.



IP, IP hooray

BT's switch to Internet Protocol could lead to a switch from expensive analogue to free VOIP calls – but many problems have to be addressed, including addressing. Clive Akass reports

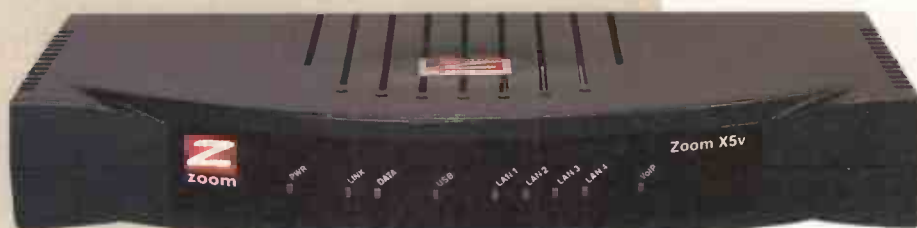
The issues surrounding BT's switch to the Internet Protocol (IP) for its entire infrastructure (see page 16) are epitomised in a new low-cost router from Zoom-Hayes that includes a Voice-over-IP (VOIP) port allowing you to use a standard phone to make free or cheap calls over the Internet.

A hotkey allows you to switch between VOIP and standard phone operation, mirroring the choice subscribers will face when they get the 'broadband dialtone' of what BT is calling its 21st Century Network (21CN).

Users who wish to use both broadband and the old phone system will see little difference from the current ADSL setup, as they will still need to install filters to separate the signals. But even BT expects to see a major switch to VOIP – and what is not clear is how this will work.

On present pricing structures, pure VOIP calls are free apart from the cost of web access. They have not gone mainstream because VOIP calls can be tricky to set up and the quality can be erratic. IPv4, the dominant IP version today, has no quality of service (QoS) provision to ensure the timely arrival of data packets necessary for voice calls. This can result in distortion and delays so that at worst a VOIP call can sound like Nasa space control calling the moon. But call quality can also be very good and it has improved with

Zoom-Hayes SIPs the world



The £99.99 four-port Zoom-Hayes X5v modem is designed for ADSL but a cable version is imminent. The VOIP port takes only one phone but you can access it from several wire-free handsets by plugging in a Dect base station.

The device has its own firewall and supports Network Address Translation (Nat). But, according to UK general manager Peter Cox, the VOIP module sits outside the firewall to avoid the problem of outside callers trying to address devices on the local network. Calls use the Session Initiation Protocol (SIP) and are free between IP devices.

Most telephony vendors are beginning to offer products using SIP as an alternative to the older H.323 protocol, which was designed to send voice and data over IP-based networks lacking the QoS control necessary to ensure timely delivery.

SIP, which is supported by Windows XP, is hardware independent and supports 'presence awareness', allowing it to inform callers whether someone is available.

www addresses, which are translated to IP numbers by DNS servers. Zoom-Hayes offers its users a gateway infrastructure called Global Village that gives them email-like addresses of the form user@globalvillage.com that its servers translate into numbers.

If long IPv6 numbers force a general change to this kind of system it will affect the design of handsets, because they will need an easy way of keying in addresses. It will need a global DNS-like system to allow any pair of VOIP users to link up easily, and to link with gateways that allow two-way interoperability between VOIP and analogue devices.

BT recognises the problem but does not feel that finding the solution is its job. 'We just provide the infrastructure,' a spokesman said.

It is hard to see how all this is going to affect BT revenues – perhaps even the company itself cannot be sure. But the spokesman said: 'A simple evaluation of price trends and technology development strongly suggests the recent dramatic downward trends will continue.'

It seems likely that online charges will follow the pattern of PC system prices. We pay much the same for a PC as we did a decade ago but get much more for our money; in a similar way the cost of bandwidth will drop but we will use a lot more of it. So we may still get a phone bill, but it will be for high-res video calls rather than voice.

the shift to broadband, better compression, and better hardware – the new Zoom-Hayes X5v VOIP router has a large buffer to smooth data flow.

The quality should get more reliable still with the rollout of 21CN, which, with an increasing proportion of the wider Internet, will use next-generation IPv6, which can guarantee bandwidth to time-sensitive traffic. But service providers may charge extra for QoS to gain revenues from voice traffic – if they can persuade users it is worth paying for.

In the meantime a sudden major switch to VOIP could hit BT with a massive revenue loss. The company does not believe this will happen; but it bowed to the inevitable earlier this year by announcing VOIP services of its own, which it now turns out was just a prelude to a complete shift to IP. But there remain formidable

problems before VOIP calls become as easy as dial-up. First there is the fact that, even on the 21CN network, analogue and VOIP systems will have to coexist and interoperate.

Several companies already offer gateways providing calls from IP phones or PCs to analogue handsets for close to the price of a local call at the country of destination. But there is no easy way to ring an IP phone from a standard handset.

Then there is the problem of addresses. It is possible (if not easy) to dial an IPv4 address, which consists of a 32bit number, usually written as four groups of up to three decimal digits. Dialling IPv6 numbers is practically impossible: they run to 128bits, replacing today's acute address shortage with a virtually limitless supply.

The problem is avoided on the web by using the familiar

999 alarm

Emergency calls are another problem to be resolved if VOIP calls are to go mainstream, according to a BT spokesman.

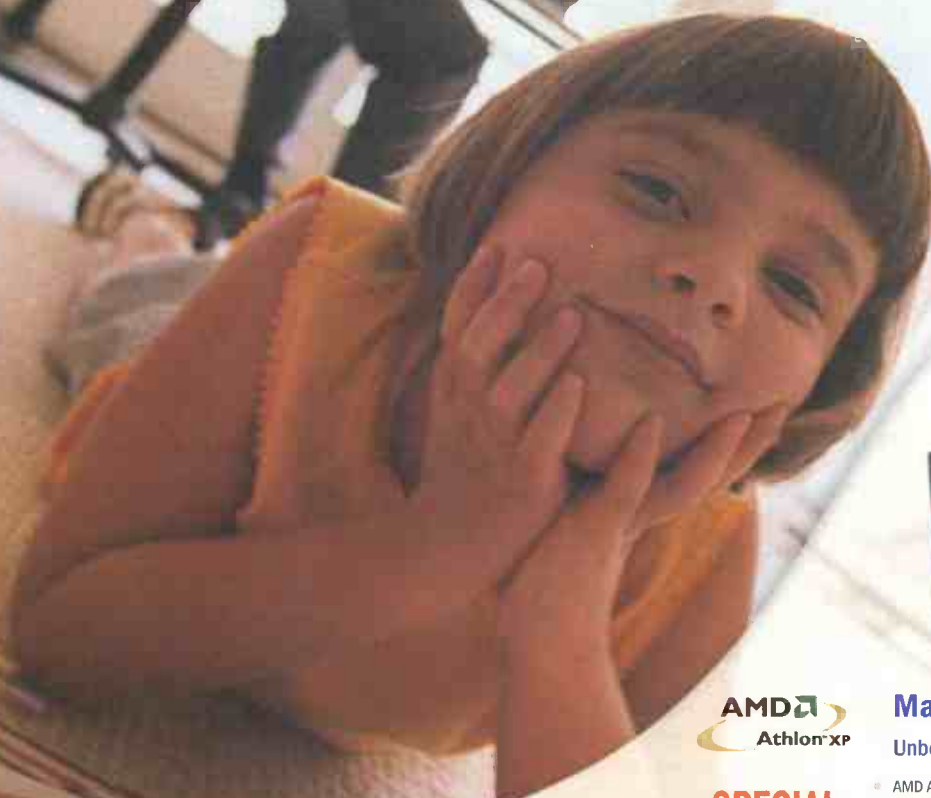
The old steam telephone system works even when there is a power cut because it has its own independent power supply. 'If you had a VOIP phone you couldn't call an ambulance,' the spokesman said.

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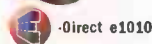
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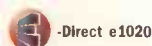
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| • Creative Audigy 2 ZS sound card | £35 EX VAT | (£41.13 INC.) |

★ STAR BUY ★

Integral USB 2 8-in-1 Card Reader

8-in-1 Supports Compact Flash, MD, SM, MMC, SD, Sony Memory Stick and MS Pro.

£19 INC VAT



proved to be top of the pile in a very strong field

PC Advisor - April 2004

MESH recommends
Microsoft® Windows® XP

NEW
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TECHNOLOGY

19" TFT



Matrix A3800+



High Performance AMD Athlon 64 Powered PC

- new AMD Athlon™ 64 Processor 3800+ with HyperTransport® Technology
- Microsoft® Windows® XP Home Edition
- ASUS A8V-Deluxe Mainboard, 2000MHz System Bus, GB LAN, IEEE 1394, SATA
- 512MB DDR 400 Memory
- 200GB Serial ATA (150mbps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce FX 5900XT, TV out and DVI
- 19" Sony TFT DVI Flat Panel Monitor
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- Creative Labs Sound Blaster Audigy 2 ZS
- Creative Labs Inspire 7.1 - T7700 Speakers + Subwoofer
- Microsoft Works Suite 2004
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- new Midi case, Plus A Series Additional Features (see right column)



Matrix FX 53



Leading Edge AMD Athlon 64 FX 53 Powered PC

- AMD Athlon™ 64 FX 53 Processor with HyperTransport® Technology
- Microsoft® Windows® XP Home Edition
- ASUS A8V-Deluxe Mainboard, 2000MHz System Bus, GB LAN, IEEE 1394, SATA
- 1GB DDR 400 Memory (2x 512MB)
- 250GB Serial ATA (150mbps) Ultra Fast Hard Drive
- new 256MB ATI Radeon X800 Pro
- 19" Sony TFT DVI Flat Panel Monitor
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- Sony 52x CD Re-Writer Drive (52x32x52)
- Creative Labs Sound Blaster Audigy 2 ZS
- Creative Labs Inspire 7.1 - T7700 Speakers + Subwoofer
- Microsoft Works Suite 2004
- Logitech Cordless Desktop Optical Keyboard and Mouse
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Midi case, Plus A Series Additional Features (see right column)



£1232.88 EX. VAT

£1449 INC. VAT

GREAT VALUE UPGRADES

- | | | |
|--|-------------|----------------|
| • Athlon™ 64 3800+ to FX 53 Processor | £75 EX VAT | (£88.13 INC.) |
| • 512MB DDR to 1GB DDR 400 Memory | £100 EX VAT | (£117.50 INC.) |
| • 128MB FX 5900XT to ATI 9800XT | £160 EX VAT | (£188.00 INC.) |
| • Upgrade to Cordless Keyboard and Mouse | £35 EX VAT | (£41.13 INC.) |

£1616.17 EX. VAT

£1899 INC. VAT

**TOP 5
RECOMMENDATIONS
OF THE MONTH**



ADSL Modem with Built-In 11g Wireless Router and 54g™ Wireless Desktop Network Card

1



£149 INC VAT

new Sony 128MB USB Micro Vault with Fingerprint Access

2

Allows you to store private data at the touch of your finger tips. Reads x 12MB/s, Writes x 7MB/s. Includes bio-metric software

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Norton Internet Security™

3

Essential protection from viruses, hackers and privacy threats. (Full version - OEM)

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new DVD-R Media - 10x 4.7GB

4

High Quality DVD-R Media 10x 4.7GB

£22 INC VAT



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5

Transfer data between any PC with USB ports. Lightweight and compact. Write-protect like a FDD, Read to 7MB/s. Write to 5MB/s

£99 INC VAT



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PCs SINCE 1987



Great value PCs featuring the high performance all-in-one Pentium 4 Platform

Elite M800 Series Additional Features

- > Mini Tower Case & 300W PSU
- > Logitech Internet Keyboard & Optical mouse
- > Internet Ready V.92 56Kbps data/fax/voice modem
- > Network Ready 10/100 Ethernet LAN
- > 3 Year Parts & Labour Warranty (see terms)

On-Board features include

- > 800MHz Front Side Bus > Dual Channel DDR 400
- > 1x 3COM 10/100Mbps Ethernet LAN
- > 6 USB 2.0 ports > 1 Audio I/O & 1 RJ-45 jack
- > 1 S/PDIF output & 1 VGA port > 1 parallel port
- > Slots include 3x PCI & 1x AGP (8x)

MESH Elite Series » PCs ideal for the Home/Office/Business User

Elite M - 3.0GHz



Amazing Value Intel PC

- Intel® Pentium® 4 3.0GHz + HT Processor (1MB Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P4R800-VM ATI Radeon IGP Mainboard
- 512MB DDR 400 Memory
- 160GB ATA-133 Hard Drive (7200rpm, plus 8MB buffer)
- 128MB ATI Radeon 9100 graphics (SMA*)
- 17" TFT Analogue Flat Panel Monitor with built-in speakers
- Sony 52x CD Re-Writer & 16x DVD-ROM Drive (Combo)
- 5.1 Surround Sound 6 Channel Audio
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus Elite Series Features (see left column)

(For Sound upgrades see our website or call for details)

£594.89 EX. VAT **£699** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|----------------|
| • Intel® Pentium® 4 3.0GHz to 3.2GHz HT | £50 EX VAT | (£58.75 INC.) |
| • 512MB DDR to 1GB DDR Memory | £100 EX VAT | (£117.50 INC.) |
| • 160GB to 200GB ATA-133 Hard Drive | £20 EX VAT | (£23.50 INC.) |
| • 17" TFT to 19" TFT Flat Panel monitor | £125 EX VAT | (£146.88 INC.) |

The Elite series features
ATI's Radeon 9100 graphics



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Replaces the standard MESH keyboard & mouse

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Elite Series PCs

The fastest PC we've seen - quite astonishing

PCW -
February 2004

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Additional Cards for your PC

Wireless LAN Card to any Elite PC **£39** INC VAT

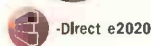
FireWire Card to any Elite PC **£18** INC VAT

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

17" TFT



Elite M - 3.2GHz



High Performance Intel based PC

- Intel® Pentium® 4 3.2GHz + HT Processor (1MB Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P4R800-VM ATI Radeon IGP Mainboard
- 1GB DDR 400 Memory
- 200GB ATA-133 Hard Drive (7200rpm, plus 8MB buffer)
- 128MB ATI Radeon 9100 graphics (SMA*)
- 17" TFT Analogue Flat Panel Monitor with built-in speakers
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- 5.1 Surround Sound 6 Channel Audio
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus Elite Series Features (see left column)

(For Sound upgrades see our website or call for details)

£765.11 EX. VAT **£899** INC. VAT

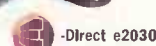
GREAT VALUE UPGRADES

- | | | |
|---|-------------|----------------|
| • Pentium® 4 3.2GHz to 3.4GHz HT | £100 EX VAT | (£117.50 INC.) |
| • 200GB to 250GB ATA-133 Hard Drive | £50 EX VAT | (£58.75 INC.) |
| • 17" TFT to 19" TFT Flat Panel monitor | £125 EX VAT | (£146.88 INC.) |
| • Add Creative SB250 Speakers | £10 EX VAT | (£11.75 INC.) |

19" TFT



Elite M - 3.4GHz



State-of-the-Art Elite PC

- Intel® Pentium® 4 3.4GHz + HT Processor (1MB Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P4R800-VM ATI Radeon IGP Mainboard
- 1GB DDR 400 Memory
- 250GB ATA-133 Hard Drive (7200rpm, plus 8MB buffer)
- 128MB ATI Radeon 9100 graphics (SMA*)
- 19" Sony TFT DVI Flat Panel Monitor
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- 5.1 Surround Sound 6 Channel Audio
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus Elite Series Features (see left column)

(For Sound upgrades see our website or call for details)

£1020.43 EX. VAT **£1199** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|--|-------------|----------------|
| • Upgrade from onboard VGA to FX 5200 | £50 EX VAT | (£58.75 INC.) |
| • 19" TFT to 20" Viewsonic TFT Monitor | £250 EX VAT | (£293.75 INC.) |
| • Additional DVD ROM Drive | £20 EX VAT | (£23.50 INC.) |
| • Add Creative SB250 Speakers | £10 EX VAT | (£11.75 INC.) |

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MESH Computers recommends Microsoft® Windows® XP Professional for Business.

Elite A - 3.2GHz



For those who need power and great graphics

- Intel® Pentium® 4 3.2GHz + HT Processor (1MB Cache, 800 FSB) Intel Hyperthreading Technology
- Microsoft® Windows® XP Home Edition
- ASUS P4P800 Mainboard, FSB 800, GB LAN, SATA
- 512MB DDR 400 Memory
- 200GB Serial ATA (150mbps) Ultra Fast Hard Drive
- 128MB NVIDIA GeForce FX 5900XT, TV out & DVI
- 17" TFT Analogue Flat Panel Monitor with built-in speakers
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- 5.1 Surround Sound 6 Channel Audio
- Network Ready 10/100/1000 Giga Ethernet LAN
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- new Midi case plus Additional Features (see below)

(For Sound upgrades see our website or call for details)

£850.21 EX. VAT **£999** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|----------------|
| • Intel® Pentium® 4 3.2GHz to 3.4GHz HT | £100 EX VAT | (£117.50 INC.) |
| • 512MB DDR to 1GB DDR Memory | £100 EX VAT | (£117.50 INC.) |
| • 200GB to 250GB Serial ATA Hard Drive | £50 EX VAT | (£58.75 INC.) |
| • 17" TFT to 19" TFT Flat Panel Monitor | £125 EX VAT | (£146.88 INC.) |

The Elite A - 3.2GHz features the latest NVIDIA GeForce FX graphics solution for every type of desktop PC user. For work or play, gaming or Web surfing, NVIDIA GPUs (graphics processing units) deliver the power and performance PC users require.



Just need a base unit PC?

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£249 EX. VAT (**£292.58** INC.)

New MESH Mini or Midi Tower case



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Microsoft Office 2003

Microsoft Office SBE 2003

Office SBE 2003 includes: Microsoft Word, Excel, PowerPoint, Outlook and Publisher 2003.



£139 EX VAT
£163 INC VAT

Microsoft Office PRO 2003

Includes the core features from the SBE Package + Microsoft Office, Access 2003, Office Publisher & Outlook with business Contact Manager.



£169 EX VAT
£199 INC VAT

(Upgrades from Works Suite 2004 - OEM versions)

Optical Storage Technology by Sony

...no reservations in recommending this machine

PC Pro -
July 2004

MESH Cubex, X-treme systems
and Notebook Series



Elite 3.4GHz X800 Pro



Ultimate Gaming PC

- Intel® Pentium® 4 3.4GHz + HT Extreme Processor (512k L2 & 2048k L3 cache)
- Microsoft® Windows® XP Home Edition
- ASUS P4P800 Mainboard, FSB 800, GB LAN, SATA
- 1GB DDR 400 Memory
- 200GB Serial ATA (150mbps) Ultra Fast Hard Drive
- new 256MB ATI Radeon X800 Pro, TV out and DVI
- 19" Sony TFT DVI Flat Panel Monitor
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- Creative Labs Sound Blaster Audigy 2 ZS Platinum
- Creative Labs Inspire 7.1 - T7700 Speakers + Subwoofer
- Network Ready Intel 10/100/1000 Giga Ethernet LAN
- Logitech Cordless Desktop Optical Keyboard and Mouse
- Microsoft Works Suite 2004
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus Elite Extreme Features (see right)



The Elite 3.4GHz X800 features
ATI's Radeon 9800XT graphics



The High Specification MESH Elite 3.4GHz X800 Pro features a Pentium® 4 Processor with HT Technology, 19" Sony TFT screen flat panel monitor and Audigy 2 ZS Platinum sound card.

Additional Features

- > Midi Tower Case & 360W PSU
- > Internet Ready V.92 56Kbps data/fax/voice modem
- > 3 Year Parts & Labour Warranty (see terms)

On-Board features Include

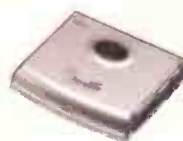
- > 800MHz Front Side Bus
- > Dual Channel DDR 400
- > 2x SATA, Raid 0 > 8 USB 2.0 ports
- > 1 parallel port > 1 VGA port
- > 1 Audio I/O & 1 RJ-45 jack
- > Slots include 5x PCI & 1x AGP (8x)

★ STAR BUY ★

40GB Fujitsu HandyDrive

USB 2.0 Data Edition Hard Drive for storing and transferring video, images, music, files etc. 480 MB/s (60MB/sec), Drive powered from Bus

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NEW Home Start Service

Save time and get total piece of mind with the MESH Home Start Service

We will send a fully qualified technician to your home/office to get you up and running - fast!

- We will setup and connect the PC & Peripherals
- Power up the PC and 'run-up' the OS
- Configure the OS with required user profiles
- Configure for internet & email
- Setup TV Card (if installed) & install peripherals
- Provide 'power-up' demo and basic Q/A

Delivery and Home Start **£99** INC VAT

- Service provided for 1 hour during office hours Mon-Fri (9am-5pm)

NEW IIYAMA Widescreen LCD-TV

17" IIYAMA ProLite C171WT

- > 17" Widescreen (43cm) LCD TV
- > Multisource picture in picture
- > NICAM stereo
- > 2.5W speakers
- > Wall mountable

£399 INC VAT



20" TFT Flat Panel Monitor

NEC MultiSync LCD2080UX+

Large screen, slim bezel design (17mm). Height adjustable and 90° Screen rotation 1600 x 1200 resolution

£699 INC VAT



All pictures for illustration purposes only
**Sony Multi-burner R/W all standard formats Except OVD-RAM

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PCs SINCE 1987



The ONLY Windows®-compatible 64-bit PC Processor

Optical Storage Technology by Sony

CUBEX 64 PCs

Cubex Series Additional Features

(can exclude special offers and reviewed PCs)

> Case 200 (W) x180 (H) x 295 (L), 2.85Kg (NW)

> Front Panel - USB x2, 1394a x1, MIC x1, Line-In x1, 6-in-1 Card Reader

> Back Panel - USB x2, PS/2, Serial Port x2, LAN Port, Parallel Port, 1394a x1

> Internet Ready V.92 56Kbps data/fax/voice modem

> 3 Year Parts & Labour Warranty (see terms)

On-Board features include

> Dual Channel DDR 400 support > 1 S/PDIF out

> 10/100 Ethernet LAN > 1 Audio I/O

> RJ-45 jack > Slots include 1x PCI & 1x AGP 8x

> 1x Surround L/R audio Jack & CNTR/LFE

MESH Multi-Media Series » PCs ideal for the Home/Office/Entertainment User

Media+ CUBEX 64



-Direct e1070

AMD Athlon 64 based Multi-media system

The compact Cubex PC features a 6-in-1 Memory card reader compatible with Multimedia card (MMC) SD, Smart media & Memory sticks.



- AMD Athlon™ 64 Processor 3000+ with HyperTransport® Technology
- Microsoft® Windows® XP Media Center 2004
- NVIDIA nFORCE3 - 150 Mainboard, FSB 800, DDR 400, IEEE 1394, SATA
- Digital MS Media Center TV card with Freeview* + Remote Control
- 512MB DDR 400 Memory
- 200GB Serial ATA (150mbps) Ultra Fast Hard Drive
- new 256MB ATI Radeon 9550, TV out & DVI
- 17" TFT Analogue Flat Panel Monitor with built-in speakers
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- Dolby Digital 5.1 Audio with Soundstorm Technology
- Creative I-Trigue 2.1 3300 Speakers with Subwoofer
- Built-in USB 2.0 6-in-1 Memory Card Reader
- Logitech Cordless Desktop Optical Keyboard and Mouse
- Microsoft Works Suite 2004
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus Cubex Series Additional Features (see left column)



£850 EX. VAT **£999** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|----------------|
| • Athlon™ 64 3000+ to Athlon™ 64 3200+ | £50 EX VAT | (£58.75 INC.) |
| • 200GB to 250GB Serial ATA Hard Drive | £50 EX VAT | (£58.75 INC.) |
| • 17" TFT to 19" TFT Flat Panel Monitor | £125 EX VAT | (£146.88 INC.) |
| • USB 512MB Pen Drive | £79 EX VAT | (£92.83 INC.) |

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WinFast USB II TV Tuner

Watch high-quality TV with stereo sound in full screen. Comes with fully functional remote control.



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X-treme Series PCs

Offers a lot of potential for business and leisure tasks

PC Plus -
July 2004

X-treme 64 PCs

The X-treme Series brings together the latest components on the market with our excellent build quality to produce the ultimate gaming PC experience.

> Break-neck CPU, awesome 3D gaming & graphics performance, thundering Dolby Digital surround sound, quality TFT monitors, cordless keyboard and mouse - all supplied with joystick and games software. Simply gaming heaven.

X-treme Series Additional Features are the same as the Matrix A Series shown on the previous page.

NEW Games Bundle 3

The latest MESH Games Bundle 3

includes Nostromo Speedpad and 3 cutting edge games:

- > Championship Manager Season 03/04
- > Lock On Air Combat Simulation
- > XIII



Comes with every X-treme PC or available with any other MESH PC for only...

£49 INC. VAT

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

* For Freeview access please check availability in your area

17" TFT



X-treme 64 Gamer



-Direct e1090

Great Value Gaming System

- AMD Athlon™ 64 Processor 3000+ with HyperTransport® Technology
- Microsoft® Windows® XP Home Edition
- Athlon 64 Mainboard, FSB 800, IEEE 1394, SATA
- 512MB DDR 400 Memory
- 200GB Serial ATA (150mbps) Ultra Fast Hard Drive
- 128MB NVIDIA FX 5200 Personal Cinema+ Remote
- 17" TFT Analogue Flat Panel Monitor with built-in speakers
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- 5.1 Surround Sound 6 Channel Audio
- Creative Inspire 5.1 P580 Speakers + Subwoofer
- Nostromo Games Bundle - Game pad - Joystick - Games bundle x3
- Logitech Cordless Desktop Optical Keyboard and Mouse
- Microsoft Works Suite 2004
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus M Series Additional Features (see Matrix series)



£765.11 EX. VAT **£899** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|---|-------------|----------------|
| • Athlon™ 64 3000+ to Athlon™ 64 3200+ | £30 EX VAT | (£35.25 INC.) |
| • 200GB to 250GB Serial ATA Hard Drive | £50 EX VAT | (£58.75 INC.) |
| • 17" TFT to 19" TFT Flat Panel Monitor | £125 EX VAT | (£146.88 INC.) |

19" TFT



X-treme 64 G Plus



-Direct e1095

64-bit Home Entertainment PC

- AMD Athlon™ 64 Processor 3200+ with HyperTransport® Technology
- Microsoft® Windows® XP Home Edition
- Athlon 64 Mainboard, FSB 800, IEEE 1394, SATA
- 512MB DDR 400 Memory
- 250GB Serial ATA (150mbps) Ultra Fast Hard Drive
- 128MB ATI Radeon 9800 PRO-AIW
- 19" Sony TFT Analogue/Digital Flat Panel Monitor
- Sony Multi-Format DVD Writer (8x DVD+/-R)**
- Creative Labs Sound Blaster Audigy 2 ZS
- Creative Labs Inspire 7.1 - T7700 Speakers + Subwoofer
- Nostromo Games Bundle - Game pad - Joystick - Games bundle x3
- Logitech Cordless Desktop Optical Keyboard and Mouse
- Microsoft Works Suite 2004
- Software: Pinnacle Studio 9 SE, Instant CD/DVD, DVD Player
- Plus M Series Additional Features (see Matrix series)



£1105.53 EX. VAT **£1299** INC. VAT

GREAT VALUE UPGRADES

- | | | |
|--|-------------|----------------|
| • Athlon™ 64 3400+ to Athlon™ 64 3700+ | £150 EX VAT | (£176.25 INC.) |
| • 512MB DDR to 1GB DDR 400 Memory | £100 EX VAT | (£117.50 INC.) |
| • Creative 4GB Muvo2 MP3 Player | £179 EX VAT | (£210.33 INC.) |

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MESH Notebook Series » Ideal for the user on the move

Ultima 17.1" - 800FSB



Pentium 4 Powered 17" Widescreen Notebook

17" WIDESCREEN

- Intel® Pentium® 4 **3.06GHz** + HT Processor
- Microsoft® Windows® XP Home Edition
- 17.1" TFT WXGA Active Colour Screen (1440 x 900)
- 512MB DDR RAM (2 x 256MB) PC2700
- 80GB ATA-100 EIDE
- 128MB DDR ATI Radeon M10 Integrated AGP 8x
- Sony Combo DVD-ROM & CDRW
- Built-In Web Camera
- Built-in Subwoofer with 4x internal speakers & 3D stereo sound
- Built-in 6-In-1 Card Reader (USB 2.0/480Mbps transfer)
- Internet Ready Internal 56kbps Fax Modem (V90 & V92)
- Network Ready Internal 10/100/1000 Giga Ethernet LAN
- Pinnacle Video Editing Version 9.5E
- FREE Carry Case • 2x USB 2.0 • TV-out • VGA output • FireWire
- Serial • Parallel • PS/2 • IrDA • S/P DIF output • 1x PC card slot
- Full size Keyboard • Kensington lock facility • Weight: 3.6Kg (excluding battery)
- 3 Year Back-to-Base Warranty - UK Mainland Only
- Dimensions: 393(W) x 275(D) x 37.5(H)mm

only **£1020.43** EX. VAT
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AVAILABLE OPTIONS
• Bluetooth
• Wireless LAN Card
• TV Tuner



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JAN 2005**

Subject to status see terms



The PowerView & Ultima Series include Hyper Threading Technology delivering improved performance for multi-tasking.

NEW Ultima 15.1" - 800FSB

A great value performance notebook from the Ultima series - 15.1" - 800FSB featuring

- Intel P4 Processor technology
- 15.1" SXGA+ screen
- Built-in Web Camera
- Sony DVD-ROM/CDRW



Check out the MESH website for the latest offers on the Notebook series
Visit us at www.meshcomputers.com

Ultima Plus 17.1" - 800FSB



Specification as Ultima 17.1" above with these upgrades...

- Intel® Pentium® 4 **3.26GHz** + HT Processor (up to 3.6GHz)
- 256MB DDR ATI Radeon M11 Integrated AGP 8x
- Built-in 7-In-1 Card Reader (USB 2.0/480Mbps transfer)
- 3x USB 2.0 • Add Bay for optional 2nd HDD with RAID 0/1
- DVI output (instead of VGA)

only **£1190.83** EX. VAT
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**the Fastest
notebook for
your money...**



Performance and all-round feature set

PC Plus - May 2004
Dynamo GX Plus

MESH recommends
Microsoft® Windows® XP

15.1" WIDESCREEN



Discovery 15.1" - 800FSB

Great Value Budget Notebook Offer -Direct e3060

- Intel® Pentium® 4 **2.8GHz** + HT Processor
- Microsoft® Windows® XP Home Edition
- 15.1" TFT XGA Active Colour Screen (1024 x 768)
- 512MB DDR RAM (2 x 256MB) PC2700
- 60GB ATA-100 EIDE
- 64MB Integrated shared graphics memory
- Sony DVD-RW & CDRW Burner
- Built-In Wireless LAN Card 802.11g
- 3D stereo sound with internal speakers & mic
- Internet Ready Internal 56kbps Fax Modem & Network Ready
- Pinnacle Video Editing Version 9.5E
- FREE Carry Case • 6x USB 2.0 • TV-out • VGA output
- 1x PC card slot • Windows 98 Keyboard
- 3 Year Back-to-Base Warranty - UK Mainland Only
- Weight: 3.5Kg • Dimensions: 332(W) x 285(D) x 42(H)mm

£765.11 EX. VAT **£899** INC. VAT



15.4" WIDESCREEN



Dynamo M11 - Wide 15.4"

Power on the go for longer... -Direct e3050

- Intel® Centrino™ **1.5GHz** Processor (Up to 1.8GHz Dathon-core 2MB cache)
- Microsoft® Windows® XP Home Edition
- 15.4" TFT WXGA Active Colour Screen (1280 x 800)
- 512MB DDR RAM (2 x 256MB) PC2700
- 40GB ATA-100 EIDE
- 128MB DDR ATI Radeon M11 Integrated AGP 8x
- Sony Combo DVD-ROM & CDRW
- Built-In Wireless LAN Card 802.11g
- Built-in 4-In-1 Smart Card Reader (supports MMC/SD/SM/MS)
- 3D stereo sound with internal speakers & mic
- Internet Ready Internal 56kbps Fax Modem & Network Ready
- Battery with Up to 5 hours user time
- Pinnacle Video Editing Version 9.5E
- FREE Carry Case • 3x USB 2.0 • TV-out • VGA output • FireWire
- Parallel • IrDA • S/P DIF output • 1x PC card slot • Windows 98 Keyboard
- Kensington lock facility • 3 Year Back-to-Base Warranty - UK Mainland Only
- Weight: 2.8Kg (excluding battery) • Dimensions: 354(W) x 250(D) x 32(H)mm

£850 EX. VAT **£999** INC. VAT

All MESH Notebooks include

- FREE Carry Case
- FREE Pinnacle Video Editing Software V.9.5E



NEW Creative® MuVo²

Tiny but powerful MP3 player

With 4GB capacity - enough for over 2000 songs! Quick and easy to use with a blue backlit LCD display.



£179 INC. VAT

USB Portable Pen Drive

USB Portable Pen Drive

Perfect for storage & carriage of your files, images, presentations etc.



32MB	£19 EX. VAT	£22.33 INC. VAT
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Foveon hits high street

The first consumer-priced point-and-shoot camera to use the revolutionary Foveon X3 sensor technology, which captures full RGB colour at each pixel node, will be launched in September. The Polaroid xS30 will cost \$399 (£217), complete with a 3x optical zoom.

It is described as having a resolution of 4.5 megapixels; but an X3 pixel is not quite the same as one on a conventional sensor, which takes four pixels to capture full colour and is less efficient. The X3 is effectively three 1.5 megapixel layers stacked on top of each other, each registering a different colour (see diagram).

X3 technology was introduced two years ago in a sensor with a stated resolution of 3.5 megapixels, but that was counting only a single layer and the effective resolution was said to be three times higher at 10.5 megapixels; with the latest



Left: The Polaroid xS30
Top: The latest Foveon F19 sensor

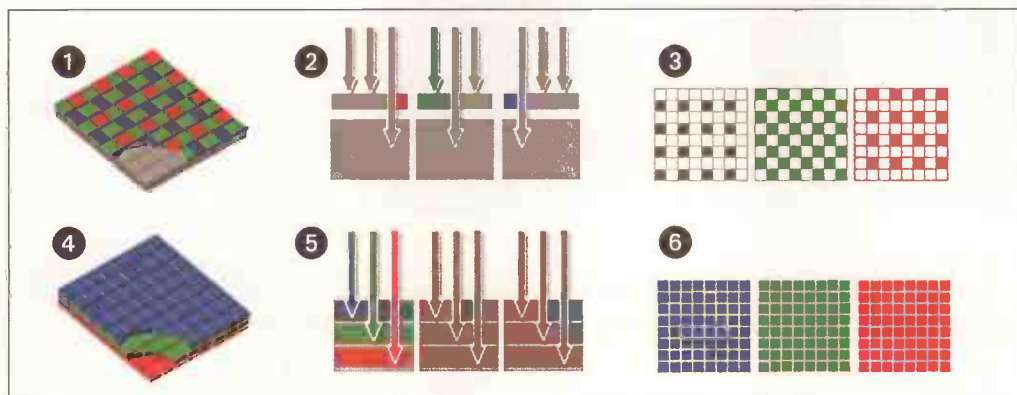
sensor, vendors are citing the higher three-layer pixel count as the resolution.

The first X3 was well received by reviewers but ignored by the major camera manufacturers, apparently because they did not own the technology, though it was used in a high-end Sigma single-lens reflex model. Even the xS30 is only nominally Polaroid – the brand has been licensed by Worldwide Licences for use on digital cameras.

X3 chips have an added advantage in that they can be

made with comparatively cheap CMOS technology. They require minimal external logic and can count a group of pixels as one, allowing the same sensor to be used for low-resolution video and high-resolution stills. The xS30 can capture 30 frames-per-second video at VGA resolution (640 x 480), and seven at full resolution.

It uses Foveon's latest F19 chip, measuring just 7.1 x 3mm with a pixel pitch of five micrometres. www.foveon.com; www.polaroid-digital.com



A conventional sensor (1) is covered by a mosaic of filters – one red, two green and one blue to each group of four pixels. Each pixel receives the light of only one colour (2) so the light of other colours goes to waste (3). Green filters pass the most detail, which is why this colour is favoured, but the need to interpolate the colour data results in aberrations. The X3 sensor has three layers of pixels (4), registering respectively blue, green and red because different wavelengths penetrate to different depths (5). The result is that all the available light energy is captured.

Prize coders sought

A university is offering a place on a computer science degree course as a prize in a coding competition – whatever the age and qualifications of the winner. Other prizes include laptops, software, books and cash.

Details of the competition run by Queen Mary's, part of the University of London, are at www.brainacademy.qmul.ac.uk.

Hard disks die before their time

One in three disk drives sent back for repair turn out to be in working order, according to storage specialist Seagate. People are losing time, money and data when the real source of their system's problems lies elsewhere, perhaps a virus or a loose connection, according to Guy Weavers, director of field applications engineering at Seagate.

The company has posted a free diagnostic utility called Seatools, (available on our August issue cover DVD) which can check out any make of drive in minutes and show where the real problem lies.

www.seatools.info/en/pr

>> Worm shield

Microsoft has developed a software shield that can protect PCs against worm attacks soon after a threat emerges without the immediate need for a patch. The generic filter examines network traffic to and from the application affected by the worm, dropping any that tries to exploit a vulnerability.

Microsoft researcher Helen Wang said patches will still be needed to prevent the shield hogging the processor as the number of worms grows; but she pointed out that nine in 10 exploit vulnerabilities for which patches are already available.

>> Penguin cool

Linux users seem to be ignoring a demand for licence fees by SCO, which claims it owns part of the operating system. SCO raked in just \$11,000 for Linux licences during its last quarter – down from \$8.25m over a similar period last year.

SCO insists that its legal battles with IBM, Novell, Red Hat and Daimler Chrysler will continue. Bert Young, chief financial officer, said: 'Our cash position is sufficient to fund lawsuits for several years.'

>> Blu-ray launch

Panasonic launches a Blu-ray Disc recorder and single and dual-layer Blu-ray discs this month. The DMR-E700BD is compatible with new dual-layer discs, which double Blu-ray disc capacity to 50GB, and current recordable DVD. Available in Japan from 31 July, there were no details of a UK release as we went to press.

>> Porn tag plea

Ofcom is asking for public comment on its plan to label adult content so that it can easily be filtered by people who do not wish to receive it. www.ofcom.org.uk

>> Each-way bet

BT Retail has extended the reach of its Symmetric Digital Subscriber Line (SDSL) business service to 150 exchanges for people who need high data rates in both directions. Asymmetric DSL is slow upstream.

Sun shines on handsets

The battle between Java and Microsoft's .Net has shifted from the courtroom to mobile phones. But it will be better for software if neither side wins outright, writes Jonathan Essex

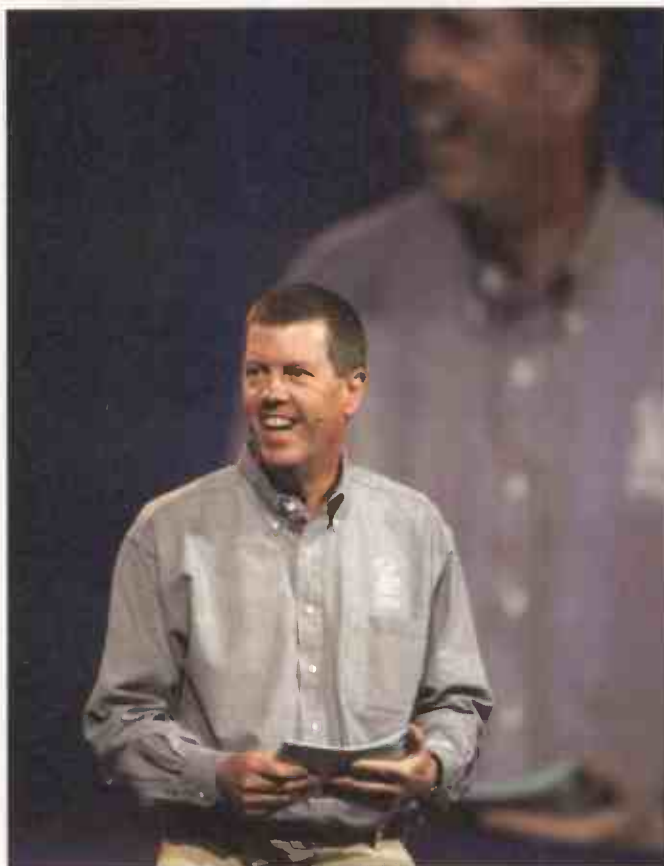
There are only two development platforms – Java and .Net, or so Sun chief executive Scott McNealy said at the latest Java One developer conference in San Francisco. Microsoft's .Net and Sun's Java certainly dominate the market in terms of the number of developers and of new applications, and the competition between the two is unquestionably the most significant driver of software innovation.

The long legal battle between Microsoft and Sun ended on 2 April when Microsoft agreed to pay Sun nearly \$2b to settle patent and anti-trust issues partly relating to Java. But Sun still has to live with the fact that most web clients are Windows PCs running Internet Explorer. Why is this a problem for a vendor of high-end server hardware and software? As Sun's chief operating officer Jonathan Schwartz said: 'A server without a client is a doorstep'.

The dominance of Explorer has made it easy for Microsoft to position its .Net server framework as a competitor to Sun's server-side Java platform (known as J2EE). By some measures, .Net has now overtaken J2EE in terms of the number of web servers on which it is deployed. Since the .Net framework will not run on Sun's high-end (and highly profitable) Sparc hardware, this is surely a matter of concern for Sun.

But Schwartz barely mentioned server-side software in his Java One keynote. Instead, he talked a lot about mobile phones, 250 million of which have been sold with web-browsing capabilities. It seems the humble mobile is well on its way to overtaking the Windows PC as the world's most pervasive Internet client.

In this market Sun has the upper hand. Microsoft's Smartphone platform has not been widely adopted, whereas many vendors have long been



Scott McNealy: 'There are only two development platforms'

selling Java-enabled mobile phones. Nokia co-sponsored this year's Java One, showing both its commitment to Java and the importance of the mobile to Sun.

Of course, statistics can be misleading. Many people never use their mobile browser – a 2in screen does not provide a great experience. But some estimate the value of the ring-tone market at up to \$3b a year, and a single game (MacroSpace's Alphawing) is reported to have been downloaded to over 1.2 million handsets.

Java's ability to mask hardware incompatibilities makes it attractive to games developers wanting their products to run on various models. It seems that 'Java on your phone' will become a

thriving market, but it's some way short of being mature.

Fortunately for Sun, there are other burgeoning markets for Java. McNealy devoted a substantial portion of his Java One address to showcasing Sun's Java gaming initiative. One product – the Phantom gaming console, from start-up Infinium Labs – is scheduled for release in the US this November and will run both Windows and Java-based games. It should significantly boost the credibility of Java as a gaming platform.

But to achieve the ubiquity it needs to compete with Microsoft, Sun has had to give Java away for free. The small change it can pick up from selling Java consumer applications will hardly make up for the revenue it will lose

if .Net gets to dominate the lucrative server-side market. Sun may be hoping to take a leaf out of Microsoft's book and use a leading position in the growing market for Internet clients in consumer devices to secure and even grow its market share on the server side, but this is not a sure thing. The potential synergy between Java clients and Java servers is undeniable, but few applications exploit it.

In order to prosper, Sun needs to meet the .Net challenge head-on and to be fair, it does seem to be quietly stepping up to the mark. Although J2EE is generally accepted to have some technical advantages over .Net, even Sun admits the Microsoft platform is much more accessible to inexperienced developers.

But the latest release of Sun's premier J2EE development tool, Java Studio Creator, adds a multiplicity of features for simple drag-and-drop creation of highly interactive websites. And Enterprise Java Beans, a notoriously over-complicated part of the J2EE platform, is undergoing a savage overhaul. Both of these efforts are plainly aimed at closing the usability gap with .Net.

Furthermore, it can hardly be a coincidence that the much-trumpeted 'Tiger' release of the core Java system will include support for generic types. This significant new language feature is also scheduled for release in the next version of C#, a core component of .Net).

Sun's legal settlement with Microsoft may prove to have been good news for everyone. The competition between the two companies has moved firmly back to the technology, and the struggle between Java and .Net should benefit both platforms. This in turn should bring better software to the consumer. It is to be hoped that neither ultimately gets the upper hand.

Apple's G5 hype rapped

Apple's claims that its latest 2.5GHz dual-processor Power Mac G5 is the world's fastest computer have hit trouble with the Advertising Standards Authority (ASA).

The company compared the G5 with a Dell Precision 650, running dual-3.2GHz Xeons, and a Dell Dimension running a single 3.4GHz Pentium 4, which it considered to be the G5's closest competitors. On its website Apple says that the G5 was a shade less than twice as fast as the Dimension running a variety of Photoshop filters, and 74 per cent faster than the 650.

But the ASA said that the G5 was the fastest 'on some applications under certain conditions but not in all circumstances for all applications.' It also said the tests seemed to be configured in a way that could give the G5 an advantage.

The ruling did not mention Apple's other G5 comparison, with an Alienware Aurora 2.4GHz running a single



Apple has come under fire from the ASA over claims that the G5 is the 'world's fastest computer'

Athlon 64 FX-53, which the company said was five per cent slower than the Dimension.

The site does not explain why Apple chose to compare a dual 64bit G5 with a single 64bit AMD Athlon rather than with a dual-processor PC running its 64bit Opteron stablemate. Nor does it specify whether the test software was optimised for the 64bit AMD chips.

The ASA rejected a complaint over an Apple claim that the 'G5 can shatter the 4GB memory ceiling that limits every other PC on earth'. It ruled that other PCs cannot do so without additional hardware.

Curiously though, it also rejected a complaint against Apple's claim that G5 is the first personal computer with a 64bit processor, on the grounds that pre-G5 64bit computers were 'workstations for business use'. Presumably including the 64bit Nintendo

games machine.

Perhaps the oddest aspect is the fact that Apple felt the need to go in for such over-the-top marketing when its products are good enough to speak for themselves. It has not launched a hoped-for 3GHz G5, but as arch-rival Intel is now apt to stress, clock rates are misleading as a measure of computer power and dual-processors more than make up for the disparity.

There are three new G5s clocking respectively 1.8GHz, 2GHz and 2.5GHz at prices ranging from £1,449 to £2,199. All have dual IBM-made 90nanometre PowerPC 970FX processors, Gigabit Ethernet, Firewire 400 and 800 ports, three USB2 ports and 54Mbps/sec Airport wireless networking. **CA**

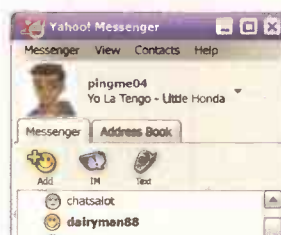
>> Shop builder

The latest update of Sitebuilder, version 2, now includes the ability to set up an online shop. Other new features include search engine optimisation and an enhanced user interface. The package, targeted at smaller businesses, includes site hosting and prices start at £29.95 a month.

www.startwiththis.com

>> Yahoo facelift

Yahoo has revamped its instant messenger client with new features such as gaming, Internet radio and animations accompanied by sounds that



can be used like emoticons 'to express mood. The new version also supports avatars, images representing the user, like the one pictured above.

www.yahoo.co.uk

>> Smart lock

The latest version 3.5a of Transparent Screen Lock Pro, which lets you view a PC display while blocking unauthorised access to the machine itself, includes an option for a proximity sensor that triggers the lock when an authorised user moves out of range. The single-user price is \$24.95 (£13.60 approx) from

www.e-motional.com

>> Memory recall

Imagerecall 2, which retrieves lost images and other data from Flash memory cards, lets you save recovered files directly to CD. It will also securely erase data and delete all data from memory cards. It costs £24.99 from

www.imagerecall.com

>> Wireless print

The E88 Office Basic printer server from Axis allows you to share any USB printer across a wireless network using 802.11b Wifi.

www.axis.com

Router boosts storage in small nets

We've seen routers sprout ports for printers, scanners and phones (see page 20) – but US start-up Ximeta is the first company to show one with a hard disk. The point of these variants, of course, is to allow peripherals to be shared across a network regardless of which machines are switched on.

Network-attached storage (NAS) has been common in enterprises for years but prices are now low enough to make it viable for small offices and the home, where demand is being driven by digital photography, video and intelligent TV recording.

The £309.99 eight-port 250GB Netdisk Office is one of three similar products from Ximeta,



Ximeta's Netdisk Office lets you add extra storage – and PCs – to a network

which has just set up a European office. The other two, the Netdisk and the smaller Netdisk Mini, come with a single Ethernet port.

Ximeta says they differ from usual NAS products in that they

plug directly into the network, rather than requiring a DHCP or IP server; also they do not use the usual TCP/IP protocols and need no expertise to set up. The disks appear as an extra drive to each networked PC.

All three have USB2 ports that allow them to be plugged directly into a PC, either for instant extra storage or for transferring files between machines.

The Netdisk comes in capacities of 80GB, 120GB, 160GB and 250GB costing between £99.99 and £279.99. The Mini version comes in a choice of 40GB or 80GB and costs £189 and £279 respectively. All prices include VAT.

www.ximeta.com



Low cost office essentials.



Paperclips, A4 envelopes, red pens... er colour laser printer. Yes an EPSON AcuLaser C900 printer really is that affordable. It brings you outstanding photo-like colour printing from as little as £259 (ex.vat), while the mono performance and running costs mean there's no need for a separate mono printer. You can save on consumables too, with the unique 'Toner Save' mode. With user-friendly installation, the AcuLaser C900 offers optional two sided printing, is networkable and will grow with you. So how can you manage without one? For more details call 0800 220 546 or visit www.epson.co.uk

Acer hedges on media PCs

Microsoft cut out a large slice of the European market for its Media Center product because it was only supplied with one language.

'We only release products for Europe when we can release them right across the continent,' said Sarah Scott, desktop business manager at Acer, one of several vendors that offer PCs with rival software for turning the machine into a multimedia entertainment centre.

Gianfranco Lanci, president of Acer's Europe division, said this did not mean Acer would not offer Microsoft's Media Center in future – nor that the company would not continue research into its own version.

He said the technology was still hampered by a lack of standards to allow PCs and electronic devices to interoperate.

The new Acer Travelmate 8000 uses a Pentium M clocking up to 2GHz on the new Dothan platform with built-in 11g Wifi, and a choice of a DVD burner or a combined CD burner and DVD player. It is targeted at businesses wishing to replace desktop machines with something more portable. Prices start at £899

'You still need a device between them to translate commands,' he said. 'And that leads to many other questions. It is not even clear if the PC or some other device will be the centre of home entertainment.'

Lanci has presided over one of the most successful periods in

Acer's history, with notebook sales growing 88 per cent last year. It was just ahead of HP as top notebook seller in western Europe over the past two quarters, and second to HP in Europe as a whole – pushing Toshiba and Dell into third and fourth place respectively.

Acer has just launched a Microsoft-based PDA called the N30, a 64bit version of its Ferrari notebook, styled in association with the eponymous racing-car team that the company sponsors, and a new skew of its Travelmate range (see caption above).

● For a review of Acer's latest projector, see page 50.



>> Science CDs

Mindscape has joined forces with the Science Museum to produce a range of £9.99 CDs covering subjects such as biology, anatomy, history, technology and space. The first five are: Cosmos Voyage – The Universe, Secrets Of The Universe, Secrets Of The Mind, Discovering Life and Touring The Planets.

>> Compact Fujis

Fujifilm says its 4.1megapixel Finepix F440 Zoom and 5.2megapixel F450 Zoom cameras set new standards in compact design, packing a 3.4x optical zoom in a case measuring just 7.45 x 6.23 x 2.13cm. They are available from August. Prices are not yet available.



DrayTek

Broadband Routers & Firewalls Vigorous Broadband Access

802.11g Wireless provides up to 54Mbps total wireless bandwidth and includes five-independent security systems including 128bit WEP encryption, 802.1x authentication, VPN-over-WLAN and Client MAC address locking. The twin high-gain diversity antennas increase wireless coverage.

11g
WLAN

A 10/100BaseT switch supports VLAN (Virtual LAN), whereby each port can have common or exclusive access to the others - ideal for sharing one Internet connection between several companies. 'Rate Control' allows you to set a maximum bandwidth limit for each of the ports.

100BaseT
LAN

The Vigor's VPN facilities enable you to set up branch-to-branch or teleworker-to-HQ secure Virtual Private Networks across the Internet, giving you flexibility, convenience and cost-saving. The Vigor routers will support up to 16 simultaneous VPNs, using industry standard high-strength encryption, and compatibility with other vendor's VPN hardware & software clients.

VPN

Two Phone ports on the Vigor 'V' routers enable you to make free voice calls to other Vigor routers, existing VoIP infrastructure or other compatible clients worldwide (inc. Windows Messenger) making maximum use of your broadband connection.

VoIP

The Vigor series of routers and firewalls is available for ADSL, ISDN, Midband/Highway, cable-modem (NTL/Telewest) or any other Ethernet Internet connection. Providing shared access to the Internet from your whole LAN, the Vigor series combines thorough feature set with top performance. Visit our web site for details of the complete range.

ADSL
Cable &
ISDN

Internet

Print
Server

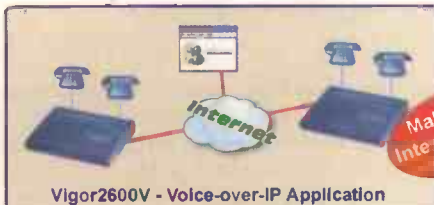
A USB Printer Port on the Vigor router allows you to connect and share a printer between all of your compatible wired and wireless PCs.

Content
Filter

The Vigor's Content Filter allows you to block downloading of potentially harmful file types as well as ActiveX and Java components. URL filtering enables you to block URLs which contain your chosen keywords or sites, backed up by syslog logging of Internet usage.

Firewall

The Vigor's Firewall helps protect your Network from potential menaces on the Internet. Stateful protection, NAT, Multi-NAT, DoS/DDoS protection and user definable packet filters can be selected as required and time schedules can be set to prevent Internet access at specified times.



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Letters

To overclock...or not? >

I'm pleased to see that overclocking is finally being accepted and encouraged (with appropriate warnings) within the PC press. Those of us who do not like to shell out large sums of cash for the latest fastest processors can often delay the inevitable change by a year or so by overclocking.

Dan Haynes

I am slightly surprised at the appearance of an overclocking column in PCW. Partly because of lot of books/articles tell you how to do it and then advise you not to. Partly because who would need to do it?

I'm an experienced, probably an expert, user and I would never attempt to overclock. I can live without the stress of wondering whether it will start again and, if not,



what do I do? I note your very carefully worded disclaimer.

Surely the only people who 'need' to overclock are the dedicated games players (and I don't mean Solitaire addicts). Judging by every gaming shop I've seen recently, hardly anyone plays games on PCs any more. The PC games are usually relegated to a small area in a dark corner while all the various console versions get the attention.

I cannot see why anyone who uses their PC for non-game purposes would ever need to overclock. More memory always has a far more beneficial effect on performance.

Roger Tilbury

Kelvyn Taylor replies > It's good to see both sides of the coin. As Dan points out, overclocking can be a cost-effective way to eke out a few extra months from an ageing PC. But Roger's point about memory is equally valid – we'd add that upgrading your hard disk to a larger, faster model is the next most cost-effective performance upgrade.

Web spam's here >

Until recently one of the important strategies with a website was getting to the top of the search engines and staying there.

Recently, however, we were alerted to a new and serious problem. One of our clients, with bona fide entries in the top two places on Google, now had a new entry. While this looked genuine – at least to the unsuspecting – clicking the link redirected

the user to a porn site, which we understand is located in Belize.

While our clients are awaiting action and a response from Google, I am writing to ask if the team at PCW has previously heard of anything like this. I'd also like to ask if you could point me in the direction of any research or articles that might be helpful?

The matter raises a whole series of issues, one of which is the steps taken by search

WIN!

The author of the Letter of the Month will win a Showcenter from Pinnacle Systems.

Connecting to your PC via either the included Ethernet cable or an optional wireless PC Card, the Showcenter allows you to watch the likes of DivX movies on your TV. You can also listen to mp3s and view pictures stored on your hard drive, while the fully featured remote control means you never have to leave your armchair. To find out more about Showcenter head to www.pinnaclesys.com.



Letter of the month

It's great to migrate >

I thought PCW readers might benefit from knowing about the Broadband Service Migration Policy, as I believe that this facility isn't being advertised as much as it should be.

This is a method of changing from one broadband service provider to another without having to deactivate your existing service, wait days, then pay for it to be reactivated for the new ISP.

I have just changed from BT Yahoo broadband to Plusnet broadband, with about two hours' down time and at no cost to myself. My only difficulty was at the very start of the process and this is why I think the procedure is not being widely advertised.

Plusnet told me BT Yahoo Broadband is one of the companies that have accepted the Broadband Service Migration Policy and they asked me to get some basic technical information.

When I asked BT Yahoo if it knew about this it claimed not to have heard of it. Nevertheless I persisted and eventually found someone at BT Yahoo who could help.

It then seemed that BT Yahoo was unable to tell me my CBUK number, due to the Data Protection Act, and they were also reluctant to confirm that my current BT Yahoo product was based on BT's IPStream Home 500. But by pestering I obtained the information and passed it on to my new ISP.

From then on it was plain sailing. On migration day, within a couple of hours I was with my new broadband service provider.

So my advice to all those who are paying over the odds for their broadband service is take a look around.

Michael Harrison

Kelvyn Taylor replies > More ISPs are advertising the benefits of the migration policy to try to get new business. Be aware that, currently, it only applies to like-for-like migrations from products based on the BT IPStream 500 service, a widely resold home broadband package. All BT-based broadband accounts have a unique CBUK number that should be provided by your ISP.

engines to verify listings. In this case, it was evidently non-existent.

Rob Knight

Kelvyn Taylor replies > This practice (known as web spam) is becoming more common, as highlighted in a PCW news story you can read at www.pcw.co.uk/news/1155758. MSN is claiming that using statistical techniques in its upcoming MSN Search technology will help fight the problem you describe. Whether or not MSN's approach will work, it's obviously an issue that more search engines are going to have to address.

Totally hammered >

In June's review of the file-shredding software Wincleaner Destroy-it Pro (p75), you say that it could be useful in sensitive commercial environments. That is true up to a point.

The usefulness of such a utility depends on how sensitive a disk's data is to the owner, and how much effort a 'bad guy' would be prepared to expend on trying to salvage the data. Whereas a small business may decide that nobody would move heaven and earth to retrieve their invoices for the past year from an old disk, a multinational company might view the information on its hard disks as so sensitive that absolute assurance of data destruction would be demanded. For example, for most of us, shredding sensitive paper documents is a satisfactory level of security. However, when Iran took control of the American embassy all those years ago, they found bundles of shredded documents which they then painstakingly sorted and stuck back together again.

Even when every bit on a disk is overwritten, slight inaccuracies in the positioning of the heads can mean that faint 'shadows' of the original data can remain at the edge of the track. Putting the platters into a drive with highly sensitive, steerable heads, can result in the retrieval of data that was thought to have been totally erased.

The only 100 per cent sure way of erasing data for good is to go out into the car park and smash the disk with a sledge hammer until it is well and truly bent, buckled, pulped, mangled and mutilated.

Alan Thomas

Rob Jones replies > A couple of years ago, I worked for a sister title of PCW when we ran a group test on destroying the data on your hard disk. We tried various software packages along with a big hammer and an electric sander. Although it did take a lot of effort to destroy the disk (and we got some odd looks), the hammer (bought from a hardware chain and costing about £10) was the Editor's Choice.

Colour printing costs >

I was pleased to see that your group test on photo-quality printers (PCW, August) included an indication of ink cost – but



disappointed to see that it only used the manufacturers' own data for five per cent coverage – typical for a business report, but not for the high-quality photographs these printers are designed to produce. Printers are amazingly cheap (when you subtract the value of the ink cartridges supplied). It is the cartridges which dominate the cost of ownership. PCW has always been at the forefront of helping readers to judge 'value for money'. You have designed 'real-world' tests so we can see (before we buy) how fast a PC will run on typical office tasks, and even on 'typical' games. Surely you could devise a standard colour printer test – for example, printing a standard set of photographs over and over again until the cartridge ran out, then telling us the ink cost per photograph. This might even encourage manufacturers to design more economical printers.

David Fanshawe

Kelvyn Taylor replies > We appreciate your sentiments, but the fact is that life testing of inkjet cartridges is a complex and time-consuming process – for example, who decides when a cartridge is 'empty'? Is it when the quality starts to deteriorate (and how do you measure this), or when the printer won't print? And what's the variation in ink fill between identical cartridges? How do you take into account head-cleaning cycles? How do you ensure comparable quality between different printers?

It's taken the industry years to come up with an agreed ISO standard for life testing mono laser toner cartridges for exactly these reasons (see story at www.pcw.co.uk/News/1156046). Having said that, PCW is always looking to improve the service it provides to readers, and this is one area we'll continue to investigate with VNU Labs.

DVD decoders >

Your article 'Let your PC entertain you' is misleading. You say that Showshifter will play DVDs. This is not so. I have recently built a new PC using a Gigabyte GA-8KNXP Ultra motherboard, Intel P4 2.8GHz processor and fitted a Pioneer DVD-121 DVD-Rom. I installed the Showshifter software and could not play a DVD because I don't have decoder software. There was none supplied with the drive, I tried to get this from the Pioneer website but I can't find this drive listed on its site.

Dr CF Dickinson

Kelvyn Taylor replies > Showshifter 3 ships with a free Nvidia mpeg2 decoder, whereas Showshifter 2 doesn't. An alternative for Windows XP users is Sonic's DVD Decoder Pack for Windows Media Player, which costs £10.12 inc VAT to download.

Patched up >

Guy Kewney's article in the August issue exactly expresses my frustration concerning Microsoft's huge patches. Yes, I have an excellent low-cost dial-up connection with Tesco, allowing me unlimited access between 2am and 4pm, but I need to use the telephone for other calls.

Could PCW help, perhaps, by placing the patches on the CD? At least then we should never be more than a few weeks out of date.

Thanks for the June article on refurbished computers; it gave me courage to buy a notebook from Dell outlet which cost less than the new price for the spec I wanted and has in fact a greatly improved spec – you saved me several hundred pounds.

Sarah E Birkin

Kelvyn Taylor replies > Microsoft has a strict policy regarding its patch distribution, preventing us (and other magazines) from putting them on cover CDs.

Solutions to July's crossword

ACROSS: 7 Board 8 Text 9 EULA 11 Static 12 Computer 13 BAPC 15 Ohm 16 Least 19 Killing 20 Revisit 23 Parts 25 ISO 26 Nest 28 Internet 30 Totals 32 Grok 33 Icon 34 Folio
DOWN: 1 Fort 2 Critical 3 Welcome 4 Stump 5 De Luxe 6 Floe 10 Echoing 14 Anita 17 Ships 18 Revolts 21 Ignition 22 Bistros 24 Tweaks 27 Angie 29 Norm 31 Lois

Solution to July's brainteaser

		6		
		8		
4	9	1	11	3
		14		
		16		

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Location, location, location...

With mobile technology enabling location-based services, Guy Kewney considers the possibilities

Boy, am I tired of waiting for 'location-based' services to take off. It's one of those things, like the paperless office, or the multimedia message service; people keep talking about it, but nobody does it.

Maps are, of course, insanely useful things. It was a map that first alerted Dr John Snow to the fact that cholera was spreading along Broadwick Street in Soho, London, from a water pump which was connected to the sewerage system by mistake. And if you go to the bother of plotting things geographically, it's amazing how often you spot a trend like that.

These days, of course, we're all going mobile. And as a result, it becomes possible to 'provide location-based services to the mobile user.' Which boils down, mostly, to adverts. As you walk down the street, your pocket electronic device is able to alert you to goods and services that you might be unaware of (so the theory goes) – as if people were incapable of putting a sign in their shop windows.

For my part, the idea that everything from socks to violins can be funded by advertising is not a technology trend. What I think is far more likely to make maps work, is something that tells other people where I am.

I recently saw a couple of hacker programmers demonstrate their compiler system. It's expensive (of course) and clever, so they cast about for something to make it look particularly special. They hit on the idea of a system that auto-blogs.

Here's the deal: you take a cameraphone with you on holiday. The moment you take a photograph, an option appears in the menu: 'Blog it?'.

When you say yes, you can enter a caption, if you like. You then press 'send', and the photograph is uploaded to your blog site, together with a map of the area in which you were standing when you pressed the button.

For the Microsoft product managers who demonstrated this, it was just a convenient way of showing that Mappoint contains maps you can match to latitude and longitude values. The mobile phone, though you may not realise this, knows roughly where you are, because it knows which cell it is in, and which other cells are near. Tie the Mappoint database of maps into the mobile phone network, and it is possible to have a big arrow pointing to your mountain saying: 'He was here!' on your blog. Easy, even.

The problem is, multimedia messaging simply isn't interesting. The reason for this is that it's beyond the typical user to set up. Too many buttons on too small a phone – no idea what to press, and when things go wrong, it's impossible to find out what happened.

The thing about this application is that it's a user application. The user can decide whether to run the software – in fact, now Microsoft is giving away the 'Express' versions of all its programming tools, the user could possibly even write the software. All you need is a contract with Mappoint at Microsoft, and they'll charge you a little for each map you retrieve.

And where does this leave the PC? If we can blog our holidays with nothing more than a cameraphone, why do we need to struggle home with our notes, plug the phone into the PC, download all the photographs, try to remember what was going on, type up the captions, and add the data to our home website?

Of course, a year ago, you'd have said: 'So that we can print the pictures out!'

Now, even that reason has gone. You can plug your phone directly into the printer, and the printer has a tiny colour display which shows you which picture you would print if you pressed 'PRINT' hard enough.

Despite this, I predict that the arrival of good, 2megapixel cameraphones means more PCs will be sold, because I think the habit of printing out one's photographs is a

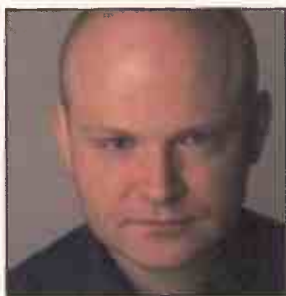
hangover from an earlier age of the world. I have two very good colour photo printers, and I haven't used them to print a photograph for a year.

What I do with my photographs is to collect them all with a freeware program called JAlbum. It scoops them all up and creates a slideshow that I can upload to my website (it will even do that for me!) and then I can just tell people what the URL is. The Exif metadata saved by the camera says what time the pictures were taken, what aperture, which camera model I used and lots more – check out the Windows Properties of one of your photos to see exactly how much.

But I have to say, I would like it even more if my photographs knew where I'd taken them, as well as when.

Am I really saying that the paperless home is just around the corner, and that location-based services are about to become real? Goodness, surely I can't be. Can I?

'I would like it even more if my photographs knew where I'd taken them, as well as when'



gordonl@pcw.co.uk

Raid your files to keep them safe

With an impending storage epidemic, Gordon Laing argues that Intel's new chipset platform is the solution

In an age where processor, memory and graphics speeds are constantly increasing, it's funny to think that much of the data in a modern PC is still transported using a bus that's over a decade old. PCI, introduced in 1993 and still running at 33MHz on the majority of desktop PCs, remains the backbone for most disk, network and peripheral traffic. This is why much of the excitement surrounding Intel's new chipset platform focused on PCI's long-overdue successor, PCI Express.

While PCI Express is one of the most important PC developments in recent years, I believe that, with Intel's new pinless Socket-T, it stole the glory from something possibly more important to day-to-day users. It may not be as glamorous, but I'd argue that one of most exciting aspects of the new PC platform is the way it handles Raid.

Raid, which stands for Redundant Array of Inexpensive Disks, was developed years ago as a means to increase storage reliability and performance. The concept is simple: a second hard disk is configured to either mirror precisely what's on the first for instant backup, or to read and write data in parallel to increase performance. These are described as Raid 1 (mirroring) and Raid 0 (striping) respectively. Sophisticated configurations employ additional disks to combine the speed of striping with the reliability of mirroring.

So far so good, but while Raid has long been a fixture in server and workstation environments, it has failed to ignite the enthusiasm of most desktop PC owners – they just haven't had a compelling reason to use it or justify the cost. Today, though, I'd argue Raid could be the only answer to an impending storage epidemic, and that Intel's latest chipsets offer one of the most tempting implementations yet.

If the figures are to be believed, we're snapping away with digital cameras as if they were going out of fashion. I know I am – in the four years I've owned a digital camera, the folder that contains my images has ballooned to over 7GB. Mind you, this pales compared to the size of most digital music collections, particularly for those who've decided lossless audio or uncompressed wavs are the way forward. I consider it lucky that I haven't got into video.

Of course, none of this is bad. Hard disks are cheap, so why not fill them with digital media? It's all part of the fun of modern computing, and it's about to get even better once we start streaming them throughout our homes. However, this digital dream becomes a nightmare when a disk fails. Weeks spent re-encoding an audio collection is bad enough, but nothing compared to losing digital

photos. Remember, once your memory card's erased, your hard disk is likely to be the only source of your pics.

We all know backing up's the answer, but how are we supposed to do it with tens or even hundreds of gigabytes worth of data? Forget CDs. My folder of photos is already bigger than a single-layer DVD and fast approaching the capacity of dual-layer media. Even tape is failing to keep up with the capacity of hard disks, at least for the average non-business user with a limited budget.

As many people have realised, the only technology that can back up a hard disk packed with media is another hard disk. One of the most popular solutions is to use an external disk enclosure with a USB2 interface, but this demands the user to schedule and execute backups. I thought I was conscientious, but to be honest I've not fully backed up in weeks. Denial is a persuasive emotion.

Which brings us back to Raid, and mirroring in particular. When hard disks were expensive, mirroring was perceived as a luxury – after all, who'd fit a pricey second disk and not enjoy its capacity? With today's low

disk prices, mirroring has become an affordable solution. For the price of a decent DVD writer and some blanks, you could get a second disk constantly backing up everything on your first, allowing you to switch immediately should anything go wrong.

Intel's Matrix Storage Technology (offered on the new 915G, 915P and 925X chipsets) goes further by appealing to desktop owners who always want extra. For example, we know mirroring is

sensible, but we still wonder how much faster our systems might be if we'd devoted the second disk to Raid striping.

Matrix gives you the speed of striping and the reliability of mirroring with just two disks. It creates two partitions on each disk and combines them to offer striping in one area and mirroring in another. So you store all your important data like documents, photos and emails in the protected mirrored section, then use the faster striped section for temporary swap files and games or applications which can easily be reinstalled from CD. Intel's made it easy to set all this up from Windows, even if you decide to move from one disk to two at a later date.

It's still crucial to back up important files onto external media (and take it with you) to protect from fire, flood and theft, but by delivering extra reliability with a performance sweetener at a time when disks have never been cheaper, Matrix Storage Technology sounds like a very tempting option for buyers of new PCs. If it delivers on its promises (which we're testing thoroughly), it could be a highly effective way of protecting against disk failure.

'Intel's latest chipsets offer one of the most tempting implementations of Raid yet'

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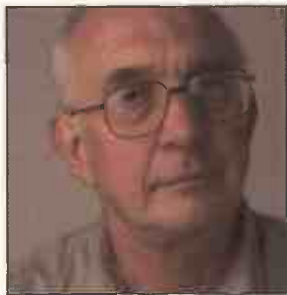
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Quality copying can inspire crime

With inkjet printers producing increasingly accurate images, Barry Fox raises concerns about counterfeiting

It surprises me that anyone should be surprised that someone who did not belong to the University of Westminster was able to forge an ID pass, and then use the university's facilities to mass-produce at least £75,000 worth of forged bus passes. The scammer – who got a 12-month suspended sentence from Harrow Crown Court – had just scanned an original pass, edited in digital photos and hard-copied the result on a colour printer.

The World Customs Organisation and Interpol recently organised a conference in Brussels on counterfeiting. The WCO's mind had been concentrated by the discovery of pirate CD-R copies of the CD-Rom database of import/export taxes that the WCO sells to Customs houses around the world for €1,000 a time. The pirated copies, with scanned sleeve notes, were being bought by the very people who are paid to stop counterfeit traffic.

In Brussels I grabbed the chance to ask Ronald Noble, secretary general of Interpol, whether he was worried about people using colour ink-jet printers and copiers to copy value documents and money. 'Few people are deceived,' he assured me. 'I don't believe it's an issue that needs to take up time.'

John Newton, Interpol's crime intelligence officer, was just as relaxed. 'We talked to the printer manufacturers about standardising on a prevention system, but decided it was not a role for Interpol.'

Perhaps Interpol's Noble and Newton should try talking to De La Rue, the company that has been printing money since 1724, makes notes for 150 currencies, including the euro, and last year bought out its main customer, the Bank of England's 300-year-old printing operation. Breaking the traditional silence on currency printing, De La Rue recently warned that inkjets are creating a new breed of 'digifeiter'.

De La Rue's John Winchcombe had told me long before the Brussels conference: 'This is a very sensitive subject but we thought it was time to say something and make people think'.

In documents sent to banks and governments around the world, De La Rue warns: 'There appears to be little appreciation of the nature of the problem – and even less sense of urgency. The world's central banks are now having to deal with an increasing number of counterfeit banknotes, generated by colour inkjet printers.'

Since the mid-1980s, the makers of the heavy-duty colour electrographic copiers used in offices and copy shops have voluntarily built in character recognition software that detects the fine detail of security marks and blocks copying. Copy shops jump on anyone trying to copy value documents.

The four main inkjet makers, Canon, Epson, HP and Lexmark, have now pushed resolution to at least 4,800 dots per inch, with each dot formed from ink droplets as small as 3picolitres. So anyone can now copy anything accurately in the privacy of their home, at the press of a button, with quality comparable to the heavy-duty machines.

'The banks, treasuries and police should be requiring printer manufacturers to act responsibly,' said De La Rue. But when I tried to talk to the National Criminal Intelligence Service they seemed wholly unaware of recent developments. 'Low-cost copiers do not have high enough quality, so you are looking at machines costing £10,000,' a spokesman assured me.

'We are confident our security measures, like watermarks and strips, stay ahead of such developments,' said the Bank of England. 'Absolutely.'

Computer software company Software 2000 has been working with De La Rue on driver software that stops home printers and copiers reproducing banknotes or secure documents. The driver looks for telltale signs of security detail, serial numbering and banknote size. Fuzzy

logic allows only low-quality, monochrome copies of suspect images.

But a year after it was first offered to the industry, still there have been no takers. Judging by what has happened to Adobe, it's probably inevitable.

The Central Bank Counterfeit Deterrence Group (CBCDG) developed a system which hides a licensed mark inside a banknote image that is then recognised by any imaging or copy software that incorporates a stop-copy plug-in licensed by the CBCDG. Adobe plugged the CBCDG software into the latest version of Photoshop.

As a result, Adobe is now widely ridiculed on the Internet, with numerous postings on simple ways to defeat the CBCDG block.

I very much doubt if this is what Adobe intended. The promise of 'no-CBCDG included' could become a unique selling point for Adobe's competitors.

So I for one am going to start looking closer at paper money handed over as change in a dark public bar.

'Anyone can now copy anything accurately in the privacy of their home, at the press of a button'

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Is broadband losing its core values?

Providers may be offering great prices, but Will Stapley warns that 'broadband' has a wide definition

Back in 2000, homes across the UK started to have a realistic and superior alternative to the standard 56Kbits/sec Internet connection. Broadband, we were told, would revolutionise the way we surf the net. Having to wait 30 seconds for your modem to dial up would be a thing of the past, the phone line would no longer be engaged when you were checking email, and the infuriating 56Kbits/sec maximum download speed we were all moaning about was to be given a shot in the arm.

Terms such as 'always on' and 'streaming media' were the new buzz words, and the Internet suddenly had a new and even brighter future. Indeed, with broadband availability increasing, more and more people are today enjoying all the benefits it has to offer.

Sadly, there appears to be a change in the wind, and I feel broadband is on the verge of losing its core values.

Take BT, for example. The recently launched BT Broadband Basic service has a monthly subscription cost of just £19.99. Not bad, you might think, but, as its name would suggest, there's more to it than meets the eye. Delve a little deeper into the offer and you'll find that this is a broadband service capped at just 1GB per month. What's more, this isn't just the download limit, it's what BT calls the transfer limit, which means traffic in terms of both downloading and uploading. So, in an average month, you'll have a total transfer limit of just 33MB per day to play with. Go over this limit and you'll end up paying extra fees. With the likes of service packs for Windows and frequent critical updates, you could easily find you're soon way over your limit.

Of course, this is one of the more extreme examples of capping and you can opt to pay an extra £10 for BT's uncapped service, but I fear it's the shape of things to come. In an effort to increase profit margins, ISPs may soon start to place caps on all but the most expensive of tariffs, leaving customers to fork out penalty costs when they cruise past their download limits.

The problem with the idea of placing a cap on your Internet connection is that your whole mentality changes. Even with a cap of as much as 30GB per month, you'll still be a more cautious surfer. Rather than getting the most out of broadband, you'll be trying to minimise traffic between your PC and the Internet. Before you click on a link you have to weigh up whether it will be a worthwhile use of your monthly limit. If you find you've come across a website that contains streaming video, you'll lurch forward to close down the offending browser window before too

much damage is done. Would you really want to fritter away a precious portion of your monthly limit by emailing all those photos to your relatives and, more worryingly, will you be so quick to download Microsoft's latest security update? In short, your entire online world becomes a far more restrictive place.

Some ISPs will claim they have to bring in caps to prevent customers from abusing the system. But surely the best way to handle the minority of users who transfer unacceptable amounts of data is to take these bandwidth hogs to task individually, rather than impose restrictions for everyone.

It's not just transfer caps that are damaging the reputation of broadband. While struggling to keep my eyes open on my morning commute, one advert from Tiscali on the tube stood out. 'The way broadband should be priced' was the glaring headline, with an impressive '£15.99 per month' slapped in a bubble next to it. I was thinking of ways to tell my current broadband provider exactly where to shove its overpriced service when I noticed the small print. The exact wording is still a bit of a blur, which is a consequence of not only my weary state but also the point size of the small print, but what it amounted to was that this was a 150Kbits/sec service. I really don't think I'm in the minority when I say that the words '150Kbits/sec' and 'broadband' should never be paired.

I realise there's no law saying ISPs providing services marketed as 'broadband' have to ensure a minimum of a 512Kbits/sec download speed, but most people have been led to understand that broadband means 512Kbits/sec or faster.

Perhaps more ominously, Tiscali has also decided to come up with a broadband offer with a 50-hours-per-month usage limit. Admittedly, the charge of 2p per minute thereafter isn't huge, but quite how you can place a timed limit on a service labelled as broadband, which is supposed to provide an 'always on' connection, is beyond me.

So what's the future for broadband pricing? If sensibly capped or sub-512Kbits/sec services are clearly promoted as such, and affordable flat-rate alternatives remain available, I won't have many complaints. But I can't help worrying that data transfer caps and other such restrictions will become commonplace – maybe even unavoidable. The 'surf as much as you like' attitude that so many of us currently enjoy may well be coming to an end, which goes completely against everything the broadband revolution stood for. I hope I'm wrong.

'Most people have been led to understand that broadband means 512Kbits/sec or faster'

Reviews

EDITED BY DAVID LUDLOW

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

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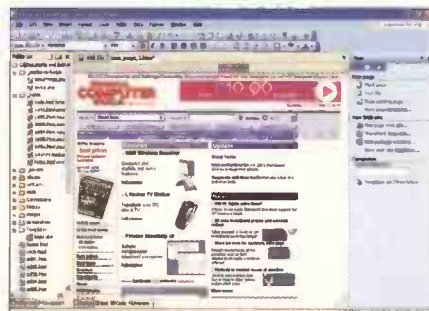
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If you don't have space for surround sound, check out these quality speakers from Altec Lansing



PAGE 64

Read our first review of a PCI Express card to find out if it's worth making the upgrade



PAGE 68

We look at Frontpage 2003, the latest version of Microsoft's web-editing tool

This month sees notebooks increase in speed, as we look at two – Hi-Grade and Asus – with Intel's new 2GHz Dothan processor. The Asus marks the Taiwanese company's return to the notebook market after an absence of a few years. It'll be interesting to see how it manages in this highly competitive market.



If you don't need a fast notebook and want something more portable, we have JVC's mininote. The chassis has been redesigned and JVC is claiming it is the world's smallest Centrino notebook.

We've tried to make our Peripherals section as diverse as possible. Of particular interest is Tomtom's new in-car navigator. This all-in-one device has all you need to find your way without buying a PDA.

It's been a while since we reviewed any speakers, so we've got our hands on Altec's FX6021 2.1 set. With a nifty flat design, they'll look happy sitting next to your PC or even in the lounge complementing a plasma screen.

If a plasma screen looks expensive, look at our DLP projector round-up. We have seven products under the microscope, with a range of prices starting from £799. We've tried to go for projectors that will suit the home and business market. If you can't afford one, try and persuade the boss to buy one for work and borrow it for home.

Moving away from work, we have LG's new 3G mobile phone, a photo printer from Epson and Creative's Muvo Slim. Similar in size to a credit card, the new Muvo offers 256MB of music for anyone who wants to travel light.

This month sees the launch of Intel's new chipset. It might not sound that exciting, but it marks a radical departure from the PCI architecture we're used to seeing. This time, we have PCI Express onboard.

Faster than PCI, PCI Express is the future for add-on cards, graphics in particular. To that end we have Gigabyte's Nvidia 5750 PCI Express card to see what, if anything, the new technology currently offers.

Meanwhile our software section includes some major new releases from Microsoft and Adobe. Microsoft is updating its productivity range, with Frontpage 2004 for web editing and Project 2004 for managing and planning new ventures.

Adobe has its new version of Premier Pro for Windows. A high-end editing tool, we've devoted two pages to see how it competes against increasingly tough competition.



Epson Picturemate

Excellent results from this portable photo inkjet - see page 58



Adobe Premiere Pro 1.5

Powerful video editing for Windows - see page 76



DIGITAL CAMERA

Canon Powershot S1 IS

3megapixels, a large zoom and loaded with features



contrast). Night shots were badly affected if viewed close up, but for standard 6 x 4in prints you shouldn't notice it too much. Another problem was that image noise was higher than expected when shooting at ISO100 or higher.

Canon supplies a 32MB Compact Flash card with the S1 IS. Although it's better than the usual 16MB cards we see with 3megapixel cameras, it will need to be improved if you're planning to go out shooting all day. The camera also accepts Hitachi Microdrives.

With the Powershot S1 IS, Canon has created an exceptional camera for those who want to advance their photographic skills without spending a fortune. The superb design mimics a digital SLR and the 10x zoom lens is great for the likes of nature shots. Meanwhile the range of manual features allows more advanced digital photographers to take full control over their photos. The £479 price tag might be a little high but, as usual, you'll find it cheaper if you shop around.

Will Stapley

DETAILS

RRP £479 (£407.66 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION Canon 08705 143 723 www.canon.co.uk

SPECIFICATIONS

3.2megapixels • 2,048 x 1,536 • Compact Flash Type I/II/Microdrive (32MB included) • 10x optical zoom • 38-380mm (35mm equivalent) • 15-1/2,000 sec shutter speed • F2.8-3.1/F8 • ISO 50-400 • 10cm macro • 30fps 640 x 480 video • 4 x AA batteries • 111 x 78 x 66.1mm (w x h x d) • 370g

PROS 10x zoom; range of features

CONS Only 3megapixels; chromatic aberration issues

VERDICT

With a host of features and a 10x zoom, 3megapixels should be enough for most amateur photographers

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

Manufacturers have realised that if they want their new 3megapixel models to be big sellers, they have to stand out from the crowd, and Canon's latest entry houses more than a few tricks up its sleeve.

The most obvious feature is the large 10x optical zoom lens and, taking around one second to switch from a wide angle of 38mm to the full telephoto of 380mm, it's not sluggish. In fact, the zoom is almost a little too quick since, despite two levels of zooming speed, we sometimes had trouble getting the exact focal length we wanted.

Powerful zoom lenses do a lot for creative shots, but the problem is you're often left needing a tripod to avoid camera shake when shooting in full telephoto mode. Canon has attempted to combat this on the S1 IS and has included an Optical Image Stabilizer. This system can be activated manually and, during testing,

we were seriously impressed by the way it managed to eliminate the dreaded camera shake.

Other notable features include the hi-res electronic viewfinder (EVF) and a flip-and-twist LCD monitor, although at just 1.5in it's a little small. Finally, there is an impressive 30fps movie mode at 640 x 480.

Manual settings are also found in abundance, which is good news for those looking to improve their photography skills. Exposure bracketing, manual focus and white balance are all waiting to be used, while the likes of aperture and shutter priority, along with a full manual mode, allow for greater creativity. Shutter speeds range from 15 seconds to 1/2,000 second with a maximum aperture of F2.8 in wide-angle mode.

With no auto focus assist lamp the S1 IS unsurprisingly had a few problems focusing when shooting in low light, although the manual focus

feature allows you to combat this. Poor lighting conditions also made the EVF harder to use.

Despite all its bells and whistles, what really holds this camera back from competing with the more expensive prosumer models is the maximum resolution. With just 3.2megapixels to play with (2,048 x 1,536), the S1 IS probably won't be of much interest to enthusiasts. While megapixel ratings have little impact on actual image quality, it does mean you won't get high-quality A4 or larger prints and cropping opportunities are limited. Having said that, with a 10x optical zoom you can get close to your subject and therefore probably won't need to crop as much, but it's still a bit restrictive.

Image quality was impressive, but not exceptional. The large zoom lens was, as expected, susceptible to chromatic aberrations (where a purple haze hampers areas of high

DESKTOP PC

Evesham Axis 64 38 Ultra

A fast performer with the latest technology



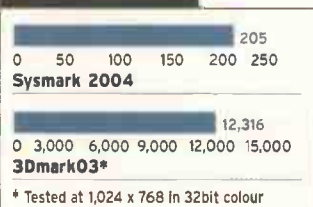
The Evesham Axis 64 38 Ultra uses the latest processor from AMD, an up-to-the-minute graphics card from Nvidia and Sony's latest dual-layer DVD burner.

Centred around an early version of MSI's 7025 motherboard, it uses a Nvidia Nforce3 250 chipset and is fitted with an AMD Athlon 64 3800+ processor, which uses the new 939pin socket. Running at 2.4GHz and backed by 1GB of DDR400 (PC3200), this system has plenty of punch, backed up by the Sysmark 2004 score of 205.

Using a 256MB Nvidia Geforce 6800 Ultra, the graphics performance scores speak for themselves. 12,316 in 3Dmark03 is impressive, as is 107fps in Unreal Tournament 2003. Evesham supplies a Viewsonic VP171s, 17in TFT monitor with the system which has a native resolution of 1,280 x 1,024 pixels.

A fast Western Digital 160GB Serial ATA (Sata) drive provides storage, so transferring large files shouldn't be a problem.

PERFORMANCE



A Creative Audigy 2 ZS card outputs to a Creative Inspire T7700 speaker system, while there is a V92 modem and integrated Gigabit Ethernet to connect the Axis 64 38 to the outside world. Rounding off the hardware is a Microsoft wireless keyboard and mouse.

There's no doubting the calibre of this PC, but with the latest components it's hard to go wrong. However, a larger hard disk and TFT would justify the high price a bit more.

Simon Crisp

DETAILS

RRP £1,878.83 (£1,599 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Evesham 0870 160 9500

www.evesham.com

SPECIFICATIONS

Athlon 64 3800+ • 1GB PC3200 DDR • 160GB hard disk • Nvidia Geforce 6800 Ultra • Windows XP Home • 17in TFT • Creative Audigy 2 ZS soundcard

PROS Very fast and well built

CONS CPU fan is a little noisy; could have a larger hard disk

VERDICT

A fast performing mix of the latest technologies, Evesham's Axis 64 38 has plenty of poke, although for the price we'd expect a larger hard disk

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

ULTRAPORTABLE NOTEBOOK

JVC Mininote MP-XV841

Decent specs in a small package

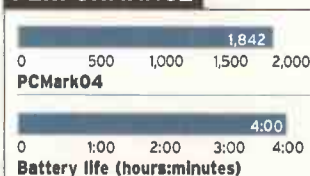


As they have been catching up on desktops, notebooks have become more powerful but in most cases portability has suffered. The JVC Mininote MP-XV841 reverses this trend with a combination of a small footprint and decent specifications.

The Mininote uses the new Centrino platform from Intel, which adds support for 802.11g. The processor is a 1GHz Pentium M with 256MB of memory. The former is quite respectable but the memory does limit Windows a little. It can be upgraded up to 768MB, as there is a spare memory slot and it would be worth taking up to 512MB as a minimum, especially as the Intel 855ME graphics chipset shares memory with the system. The native resolution is 1,024 x 600 but the graphics support panning over a total of 2,048 x 1,536. This is a little extreme but it does mean you can use software demanding a minimum of 1,024 x 768.

A port replicator is supplied with the Mininote but even without this there is little lacking.

PERFORMANCE



There are two USB2 ports, mini Firewire, network, modem, an SD (Secure Digital) card slot and a single Type II PC Card slot.

The battery fits onto the back making the notebook bigger than it first appears. It delivered four hours of battery life.

As a stylish, yet easily transportable notebook the Mininote scores highly. However, the high price and relatively underpowered specifications mean that those who want a bit of oomph should look elsewhere.

Tim Smith

DETAILS

RRP £1,656 (£1,409.36 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

JVC 0870 330 5000 www.jvc.co.uk

SPECIFICATIONS

Windows XP Pro • Intel Pentium M 1GHz • 256MB DDR (248MB after graphics share) • Intel 855 motherboard • DVD/CD-RW drive • Intel 855 integrated graphics • 40GB hard disk

PROS Very portable without significant compromise

CONS Small keyboard

VERDICT

A great little notebook for people on the move, although you'll still hanker after a more powerful desktop for use at home

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

NOTEBOOK PC**Hi-Grade C7000-2000**

Fast, affordable and well featured



On the surface, the C7000 looks like any ordinary business notebook, but below the charcoal grey exterior you'll find a highly promising specification. Its 512MB of Ram is standard fare, but it is one of the first portables we have seen that features a 2GHz Dothan processor. Intel's latest mobile offering has twice the cache of previous Pentium M processors and can achieve higher clock speeds, while consuming around 10 per cent less power.

In our benchmark tests, the C7000 racked up a Sysmark score of 156. This is one of the highest scores we've seen, but is lower than the 167 achieved by the Asus M6B00N (for review see page 48), which uses an identical processor. Fortunately, amends are made thanks to the three hours, 25 minutes of battery life.

Notebooks aren't renowned for their graphics abilities, but the C7000 fared well. Its 128MB Radeon 9600 graphics card helped it achieve a 3Dmark03 score of 2,562. It can't compete with the Radeon 9700 seen in the Asus M6B00N, but you'll be

able to play any of your favourite games at lower detail.

The rest of the C7000's specification is impressive. The review model features a 3-in-1 memory card reader along with a 60GB hard disk. Hi-Grade has also included an integrated multiformat DVD rewriter, which is capable of writing to plus, minus and Ram media.

The C7000 is a solid and well-specified notebook that provides strong performance and good value for money.

Rory Reid

DETAILS

RRP £1,467 (£1,249 ex VAT)

BEST PRICEwww.pcw.co.uk/bestprices**PRODUCT INFORMATION**

Hi-Grade

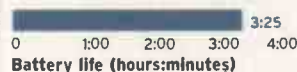
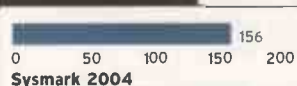
www.higrade.com**SPECIFICATIONS**

Intel 2GHz Pentium M • 512MB of DDR Ram • 60GB hard drive • 15in XGA/SVGA display • Internal four-speed DVD-RW • 128MB ATI Radeon 9600 graphics card • 326 x 270 x 30.3mm (w x d x h) • 2.9kg • Windows XP Home • Panda Antivirus • 2yrs C&R warranty

PROS Fast processor; battery life**CONS** Bland looks; quite heavy**VERDICT**

A fast, affordable notebook with a solid specification and long battery life

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

PERFORMANCE**NOTEBOOK PC****Sony VGNA115B**

A stylish notebook with plenty of software



If there's one thing you can rely on Sony for, it's stylish design and its new notebook, the A115B, is no exception. With its black and grey colours and sleek, sweeping curves it looks like a notebook to contend with.

Inside, a 1.5GHz Pentium 4 M processor sits alongside 512MB of Ram. The Sysmark 2004 score of 107 is above average and certainly good for working on the move.

You should be able to play some games thanks to the ATI Radeon 9200. Using dedicated memory, it's a lot better than standard onboard graphics. Returning a score of 1,103 in 3Dmark03 it shows that it's good enough to run some older games at low detail levels. However, it's likely to struggle with the latest first-person games.

The VGNA115B uses a 15in TFT, which is a good size for a notebook. It's a reflective display, so blacks are pure black. However, due to the way the screen is made, large areas of black act like mirrors, which

may put some people off. It's also a shame that the screen has a native resolution of 1,024 x 768. We're used to seeing the higher 1,440 x 1,050 resolution that is a lot easier to work on.

Storage is catered for by a 60GB hard disk, which is ample for a notebook. The disk comes packed with copies of Adobe Photoshop Elements, Microsoft Works 7 and a range of other utilities. There's a DVD+RW drive installed, so you can always archive old files.

David Ludlow

DETAILS

RRP £1,299 (£1,105.53 ex VAT)

BEST PRICEwww.pcw.co.uk/bestprices**PRODUCT INFORMATION**

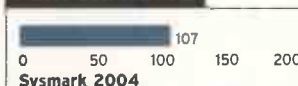
Sony 08705 424 424

www.sony.co.uk**SPECIFICATIONS**

1.5GHz Intel Pentium 4 M • 512MB of Ram • 60GB hard disk • DVD+RW drive • Wifi • 15in TFT (1,024 x 768 resolution) • ATI Radeon 9200 • Memory Stick Pro slot • 3kg • 342.5 x 276.5 x 43.5mm (w x d x h)

PROS Light; good software bundle**CONS** TFT only has a maximum resolution of 1,024 x 768**VERDICT**

Another stylish notebook from Sony. The great software bundle makes it good value for money

PERFORMANCE

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

NOTEBOOK PC

Asus M6B00N

The fastest notebook we've ever seen



The influx of Dothan-equipped notebooks continues in earnest this month, with the Asus M6B00N. It is a stylish offering that marks Asus' long-awaited return to the portable market. As its 3kg frame suggests, this notebook can be carried around, although not necessarily for long periods.

It has a 15.4in TFT screen, a four-speed dual-format DVD writer and an 80GB hard disk. To the rear, you'll find four USB and a single Firewire port, plus a more traditional PC Card connector to the left-hand side of the keyboard.

Shortcut buttons for multimedia operations are accompanied by buttons above the keyboard that provide one-touch access to your email client and Internet browser. There is also a dedicated button to cycle between different screen-brightness profiles, including a low-intensity mode that extends battery life.

In terms of performance, the M6B00N has 1GB of memory paired with a 2GHz Intel Dothan processor. This helped it

rack up 167 in Sysmark 2004 – the highest benchmark score we've seen in a notebook.

Asus hasn't cut corners with the graphics performance. The M6B00N uses an ATI Mobility Radeon 9700 with 128MB of dedicated memory, which helped it score 2,693 in 3Dmark03. Again, this is the highest notebook score we've seen.

The M6B00N's two hours and 43 minutes of battery life isn't great, but if you look past this it is a very desirable piece of kit.

Rory Reid

DETAILS

RRP £1,996 (£1,699 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Asus www.asus.com.tw

SPECIFICATIONS

Windows XP Professional • Intel Pentium M 2GHz • 15.4in TFT display (1,400 x 1,060 native resolution) • 1GB of DDR Ram • 80GB hard disk • Dual-format 4x DVD rewriter • 128MB ATI Radeon 9700 graphics card • 3kg • 4 USB2 ports • Firewire • PC Card slot

PROS Very fast; great specification

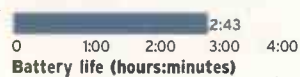
CONS Heavy; battery life

VERDICT

The fastest notebook we've ever seen, but the processor adds a hefty premium to the price

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

PERFORMANCE



DESKTOP PC

Packard Bell Imedia 3082

A good workhorse, but lacking in value



Housed in what could be described as an uninspiring case, the 3082 comes in at the higher end of Packard Bell's Imedia range.

The system is based around a 2.8GHz Pentium 4 processor and 512MB of Ram, but it's important to note that only 384MB is available as system memory since Packard Bell has opted for integrated graphics.

The Radeon 9100 IGP chipset takes control of 128MB from the system memory, while an AGP slot sits on the motherboard. If you want to run graphic-intensive applications or games, we'd recommend you upgrade.

Going some way to make up for this is the TV tuner card. It's only an analogue version, so you won't be able to pick up digital Freeview channels, but it does add extra functionality.

A versatile NEC ND-2500A DVD writer occupies one of two 5.25in drive bays and is capable of eight-speed writing to both DVD formats. Hard disk storage is taken care of by a Seagate Barracuda 7,200rpm drive with a

60GB capacity. If you're thinking of recording live TV, it won't be long before you need to purchase a second drive.

In terms of performance, our 3Dmark03 benchmark result of 805 proves that this PC is no games machine and, while the score of 127 in Sysmark 2004 is acceptable, it's not outstanding.

The Imedia 3082 houses some interesting features, but there are better deals to be had. If you don't believe us, see our Student PC group test (page 113).

Will Stapley

DETAILS

RRP £899 (£765.11 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Packard Bell

www.packardbell.co.uk

SPECIFICATIONS

Intel Pentium 4 2.8GHz • 512MB of Ram (384MB available) • 60GB hard disk • NEC ND-2500A DVD-RW • ATI Radeon 9100 IGP • 17in TFT • Windows XP Home • Cyberlink Power Cinema • Microsoft Works 7 • Norton Internet Security 2003

PROS TV tuner; good software package

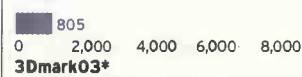
CONS Graphics; poor performance

VERDICT

As a workhorse PC it performs well, but it's not great value for money

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

PERFORMANCE



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



NAVIGATION SYSTEM

Tomtom Go

A pleasure to use, if you can afford it



GPS navigation systems are ever more popular, and the new Tomtom Go aims to provide drivers with a one-stop device to resolve their navigation woes. In the past, we've reviewed a Tomtom system for Palm devices (www.pcw.co.uk/Products/Hardware/1155013) and a similar Navman system for Pocket PCs (www.pcw.co.uk/Products/Hardware/1154926). However, this is the first time we've looked at a standalone system that doesn't need a PDA.

With a stylish, uncomplicated design, the Tomtom Go doesn't take long to get used to. Charge it up using the AC adaptor or the cigarette lighter adaptor, hit the power button and you're away. The unit sits on an adjustable mounting bracket that attaches to a window with a sucker pad.

An SD (Secure Digital) card slot is used to load maps, while the touchscreen makes navigation through the various menus an effortless task. When it comes to using the on-screen keyboard to enter street names, it can get fiddly, although you shouldn't use it while driving.

The Tomtom Go is a pleasure to use. The 3D map view worked well, while the audible directions allowed for truly effortless navigation. Miss a designated turning and your route will be recalculated automatically.

There are some minor faults with the Tomtom Go. Despite

Tomtom's claim that it offers uninterrupted navigation in tunnels, during testing we found it lost the satellite signal pretty quickly after going underground. In fairness, you wouldn't expect it to work effectively through long tunnels and the signal is soon picked up at ground level.

The price tag of just under £500 may persuade drivers to stick to their Michelin maps, but if you can spare the cash and don't have a PDA, the Tomtom Go comes highly recommended.

Will Stapley

DETAILS

RRP £499 (£424.68 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Tomtom

www.tomtom.com

SPECIFICATIONS

200MHz Arm920T processor • GPS receiver with built-in antenna • 3.5in TFT screen • 32MB Ram • Internal Li-ion battery • 128MB SD card (with GB map) • Internal speaker • 115 x 91.5 x 57.5mm (h x w x d) • 310g

PROS Well designed; easy to use**CONS** Reasonably expensive

VERDICT

As an all-in-one satellite navigation system, the Tomtom Go works like a dream and is easy to use

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

19IN TFT

Philips Brilliance 190P5ES

High-quality display that lives up to its name



The Philips Brilliance 190P is the latest 19in TFT to reach our desks but, despite the contemporary silver finish on our review model, it doesn't make a particularly good first impression.

It has a relatively thin bezel along both sides of the unit, but the effect is spoiled by the thick bottom edge. This houses the 190P's stereo speakers and control buttons, but given the lacklustre performance of the audio output, we couldn't help but feel this space could have been used more wisely.

To its credit, the 190P is a well-built unit with a sturdy, if somewhat large base. It is also very flexible and can be rotated approximately 180 degrees along its horizontal axis. The vertical tilt range is fairly limited and it is not height adjustable, but the screen itself can be rotated between portrait and landscape modes.

Philips has put a lot of work into making sure the 190P is a strong performer. It has a wide viewing angle, so if you're using it with a group of people, they won't have to huddle towards the centre of the screen in order to get a good picture. The fast 16ms response time means it is equally at home displaying static office documents as it is playing games or DVD movies.

Overall image quality was also of the highest order. Natural

tones were recreated realistically and the contrast between hues was noticeably better than many TFTs we have seen before. There was also no noticeable variation in brightness across the panel, as is common on many cheaper monitors.

The price tag isn't too exorbitant for a monitor of this size, although people looking for a resolution of 1,600 x 1,200 will have to opt for a larger display, as few 19in models support this mode.

Rory Reid

DETAILS

RRP £485 (£412.77 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Philips 0870 900 9070

www.philips.co.uk

SPECIFICATIONS

19in panel • 1,280 x 1,024 native resolution • 16ms response time • 700:1 contrast ratio • DVI-D and Analogue Inputs • 170 degree viewing angle (horizontal and vertical) • 65 degree swivel

PROS Picture; wide viewing angle**CONS** Not particularly attractive

VERDICT

The Philips Brilliance range lives up to its name with this model, which is a high-quality display

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

DLP PROJECTORS

Projector round-up

We look at seven sub-£2,000 models to help you choose the best projector for your needs



The Acer PD112 is an SVGA projector

Digital light processing (DLP) has been called the 'weirdest technology ever invented'. While that may be an over-statement, DLP is unusual. Traditional LCD or TFT projectors work by turning pixels on or off to block light from the lamp before it reaches the screen, whereas a DLP projector uses a chip called a digital micromirror device (DMD).

This Texas Instruments invention dates back to 1987, with a semiconductor carrying a grid of micro-mirrors, with one micro-mirror for each pixel of the native resolution of the projector. A 0.55in DMD has an SVGA resolution of 800 x 600, a 0.7in DMD handles XGA 1,024 x 768 and the 0.9in DMD has a native SXGA resolution of 1,280 x 1,024.

The DMD is only part of the DLP system. The lamp shines through a rotating colour wheel which carries segments for the primary RGB colours, and manufacturers can choose to include a white (clear) segment on the colour wheel. Pure home cinema DLP projectors tend to have no white segment; crossover and commercial projectors will have a white segment so text on a white background looks sharp and bright.

Each mirror on the current generation of Texas Instruments DMD chips swings through an arc of 12°, so they are able to completely block off light. This

means that a DLP projector can display a true black, which is an absence of light rather than a colour in its own right. So a DLP projector can have a high contrast ratio, and therefore superb images. We've compared seven models of DLP projectors that cost less than £2,000.

Acer PD112

The Acer PD112 is one of three SVGA projectors in this round-up, so it has a native resolution of 800 x 600 pixels. This is entirely adequate for business use and will suffice for watching movies, unless you want to watch widescreen movies at the maximum magnification where the resolution can get a little marginal. Although the specification of the Acer states that you can stretch to a higher non-native resolution, this will result in poor picture quality.

This is one of the biggest projectors here. It uses its relative bulk to carry more ports, although it doesn't begin to compare with the options that you get on a true home cinema projector.

In addition to the usual VGA, S-video and RCA video inputs, Acer includes VGA output – handy for passing the signal to another monitor – and a USB port for mouse control.

In the box there's a decent selection of cables as well as an RGB-to-VGA adapter, so we have no complaints about the

package Acer supplies. However, the display quality is questionable.

We were happy with the clear and accurate colour tones but, despite the relatively low 1,300 lumens

brightness rating, we found the PD112 harsh on the eye. We had to decrease brightness to correct this, making the picture rather dim, which was the best compromise we could achieve.

The PD112 also suffered from stray colours during DVD playback, which seemed like a variant on the DLP rainbow you get when a projector uses a four-segment colour wheel with a slow rotation speed. This should be a thing of the past and, as we understand the PD112 uses a six-segment wheel, it shouldn't be present in this model.

Benq PB6100

The PB6100 from Benq also has an SVGA resolution and is a similar size and shape to the Acer model, but it's more stylish. The casing is mainly black with a silver insert around the control buttons, which have green backlights to help in a darkened room. Benq continues the stylish theme by supplying a tiny remote control, little bigger than a credit card but perfectly functional.

When we turned the PB6100 on, the initial roar from the two cooling fans took us by surprise. However, the noise soon

quietened down – we would estimate that the 34dB rating is accurate. Those fans expel a lot of waste heat, which means that the casing stays cool to the touch but there is a lot of light spill to the rear of the projector, which could get distracting if you position the Benq in the middle of a conference table.

Out of the box the PB6100 is set on a default presentation mode, which is bright enough to use in a lit room. Mind you, with a rating of 1,500 lumens we would expect nothing less. We looked on the web to see what prices we could find for this model, and were surprised to find one e-tailer selling it in a package with an Xbox console thrown in free of charge. The PB6100 has a rather average picture, so it makes sense to position it as a luxury gaming accessory instead of aiming at business or home cinema markets. Technically the PB6100 is uninspiring, but it's a very capable projector.

Dell 3300MP

Turn on the Dell 3300MP and an LCD springs into life to tell you the status of the projector, while the blue backlights help you use the controls when the lights are out. Dell has labelled the ports clearly and you'll find the biggest selection of cables offered by any manufacturer in this round-up.

The emphasis is on making life easy for the customer, and we heartily commend Dell for this approach. Dell has chosen to use an M1-DA connector with

The Benq is a stylishly designed and capable projector



an M1-DA-to-VGA cable, so the 3300MP can handle both analogue and digital inputs.

In operation there is no obvious jet of waste heat from the vent on the left-hand side, and the casing remains cool to the touch. It's a relatively noisy model at 38dB, but we didn't find the noise intrusive, which just goes to show that noise ratings don't convey anything about the quality or type of noise that a device produces.

Add that to the native XGA resolution, brightness rating of 1,500 lumens and a passable contrast ratio of 1,700:1, and you may expect us to have been bowled over by the 3300MP, but that wasn't the case. Colour control was good and blacks and whites superb, but we were unimpressed by a lack of sharpness and definition.

We regard that as a significant problem for a business projector as it impacts on presentations and as Dell only lists its projectors in the 'medium and large businesses' section of its website, this is clearly the intended use for the 3300MP.

We had another complaint when it came to the power cord. The cable is approximately one metre long, but Dell uses the same proprietary connector that you find on its notebooks so you can't substitute a longer cable. This is a nuisance, as projectors are rarely positioned near a wall socket.

On its website Dell lists the usual replacement bulbs and an optional ceiling mount, but it also offers a 6-in-1 card reader. This module plugs into a slot above the ports on the rear of the projector and, at £68 ex VAT we can see that it could be very useful for a number of customers, but we can't shake the feeling that this business projector is best suited to home entertainment duties.

The Dell 3300MP is aimed at medium to large businesses



The Infocus X2 will suit most users and is great value for money

Infocus X2

The Infocus X2 is the biggest, heaviest and noisiest projector in this round-up. Despite those handicaps, we like it a great deal. Infocus has managed to turn the relatively large casing into an asset by using the space that it offers to good effect. The lens housing and the ports are recessed just enough to make accidental damage a near impossibility and there are 12 control buttons on the top of the projector, so there's no need to navigate through menus and sub-menus to make adjustments.

We're not keen on the way the kettle power cord sticks out of the left-hand side, but the cord itself is good and you could substitute a right-angled cable easily and cheaply.

You don't get many cables with the X2 and the remote control is typical of the kind, but we felt that the Scart-to-RGB adapter was a nice touch, as was the use of an M1-DA input (see Dell review, page 50). Infocus also offers an 802.11b wireless module that it calls Liteshow for £249 ex VAT so you can do away with the cable connecting your notebook to the projector.

We weren't expecting much from the X2 at this stage, as it looked like a fairly average budget DLP projector, but that all changed when we turned it on. Text was superbly crisp and colours are cool rather than

vivid. By the time we'd watched a few scenes of *Sleepy Hollow* on DVD and forced down a couple of Powerpoint presentations we were convinced about the virtues of this projector. Even though this is a brand new model, we believe the X2 uses a relatively old two-speed colour wheel. This has four segments, but you'd never know it when you watch it in action.

NEC LT170

The LT170 is part of the NEC's Micro and Ultra Portable range and has unusual looks. The front face is approximately square in shape, while it is the same length as a conventional projector. The overriding impression is that NEC has spent a great deal of time squeezing an XGA pint into a half-pint casing. The smart silver and black finish has a rubbery feel, and fingerprint marks show up too clearly.

Instead of conventional setup buttons, NEC has installed a selector dial that you rotate to move through the options on the menu, then you jog the dial to make your selection.

The carry case for this projector is tailored to fit the LT170 and, compared to the briefcases we are used to, it is small and light, but it does rather look as though you are carrying a large Battenberg cake in a shoulder holster.

The NEC LT170 is decent but not impressive



Part of the reason the carrying case is so small is that you get very little in the package – just a power cord, VGA cable, tripod adapter, the projector and the remote. The compact nature of this projector throws up a few more oddities, so the ports and connectors are on the left-hand side with all the cables sticking out. There's no lens cap, but there's a lens shutter that you flip across to protect the lens.

It's an active design that cuts power to the lamp, so you can flip it on and off during a presentation. The design on the LT170 means that the cooling fan has to work quite hard to cool the lamp, so the back half of the casing gets rather hot, while the fan is fairly noisy.

Although this is a decent XGA projector, it appears to be a triumph of styling over engineering and the picture quality falls somewhere between the Dell and Infocus models. Not bad, but not impressive.

Optoma EP725 and Viewsonic PJ255D

We've combined the Optoma and Viewsonic reviews, as both manufacturers are selling the same projector under their own model codes. It's tiny and, although you can't tell from the photo, has the footprint of a sheet of A5 paper. The tiny case has forced the designer to cut back on the lumens rating to help the cooling fan, which is relatively noisy despite its 36dB rating.

Once you get over the shock of the size, you appreciate the advantages offered by a projector that weighs less than 1kg and will fit in any bag or briefcase. This is a conventional XGA DLP projector with decent colour control and text presentation.

The XGA resolution is a bonus, but customers who buy this projector won't be too concerned

about that. Instead they are prepared to pay a moderate premium for the convenience of a pocket-sized projector and they will be willing to put up with some noise and low brightness.

This description will appeal to plenty of potential customers, but it doesn't include ourselves. Having said that, if this is the start of a trend towards smaller projectors, we think that it is a thoroughly good thing.

Get the right model

Every projector we looked at had good colour control, but of course we'd expect that from DLP technology. Manufacturers tend to be quite close-lipped about the technology they use



The Optoma/Viewsonic model is tiny but has a decent specification

inside their projectors, which is annoying as it makes such a difference to the performance.

The Dell 3300MP has plenty of features to make life easier, but we were surprised it had failings when it came to the

presentation of text as it seemed to be a pure business model.

The NEC has an unusual design and plenty of merit, but runs rather hot and is too noisy for our tastes. With the high price tag, its appeal is limited.

We were more impressed by the Optoma/Viewsonic as it is tiny yet has a decent specification. Despite the difficulty of getting heat out of a tiny casing without making it too noisy, this model strikes a good balance, although you pay a premium for the privilege of the small form factor.

Benq uses an unusual twin fan design in the PB6100 and it's an attractive projector, but while its brightness and price were plus points, we decided that the PCW Recommended award should go to the Infocus X2.

This model breaks no new ground technically, but it is an excellent projector that will suit most users, at very good value.

Leo Waldoock

MANUFACTURER	ACER	BENQ	DELL	INFOCUS	NEC	OPTOMA	VIEWSONIC
MODEL	PD112	PB6100	3300MP	X2	LT170	EP725	PJ255D
Price inc VAT (ex VAT)	£938.83 (£799)	£859 (£731.06)	£1,139.75 (£970)	£799 (£680)	£1,991.63 (£1,695)	£1,562.75 (£1,330)	£1,399 (£1,190.64)
Contact	0870 900 2237	01442 301 000	0870 152 4699	08000 286 470	020 8752 3665	01923 691 866	01293 643 900
URL	www.acer.co.uk	www.benq.co.uk	www.dell.co.uk	www.infocus.com	www.nec.co.uk	www.optoma.co.uk	www.viewsoniceurope.com/uk
Technology	0.55in DMD DLP	0.55in DMD DLP	0.7in DMD DLP	0.55in DMD DLP	0.7in DMD DLP	0.7in DMD DLP	0.7in DMD DLP
Brightness (Ansi lumens)	1,300	1,500	1,500	1,600 (1,100 whisper mode)	1,500 (1,350 eco mode)	1,100	1,100
Lamp power (watts)	200	200	180	200	145 (130 eco mode)	120	120
Rated life of bulb (hours)	2,000 (3,000 eco mode)	2,000	3,000 (5,000 eco mode)	3,000	1,500 (2,000 eco mode)	2,000	2,000
Contrast ratio	2,000:1	2,000:1	1,700:1	2,000:1	1,000:1	2,000:1	2,000:1
Throw distance	0.6-12m	1.5-10m	1.2-12m	1.5-9.8m	1.1-8.1m	1.2-10m	1.2-10m
Native resolution	800 x 600 SVGA	800 x 600 SVGA	1,024 x 768 XGA	800 x 600 SVGA	1,024 x 768 XGA	1,024 x 768 XGA	1,024 x 768 XGA
Other resolutions	1,024 x 768 XGA, 1,280 x 1,024 SXGA	1,024 x 768 XGA, 1,280 x 1,024 SXGA	1,280 x 1,024 SXGA	1,024 x 768 XGA	1,280 x 1,024 SXGA/1,600 x 1,200 UXGA	1,280 x 1,024 SXGA	1,280 x 1,024 SXGA
Aspect ratio	4:3 native	4:3, 16:9	4:3 native	4:3, 16:9	4:3 native	4:3, 16:9	4:3, 16:9
Power consumption (watts)	270	285	224	200	196 (170 eco mode)	170	170
Connections (inputs)	VGA/Component/S-video/RCA/USB	VGA/S-video/RCA	VGA/S-video/RCA/audio	VGA/S-video/RCA/audio	VGA/S-video/RCA/audio	VGA/S-video/RCA	VGA/S-video/RCA
Connections (outputs)	VGA pass through	x	VGA pass through	VGA pass through/audio	x	x	x
IR remote control	✓	✓	✓	✓	✓	✓	✓
Weight of bare projector	2.2kg	2.7kg	1.8kg	3.1kg	1.8kg	0.95kg	0.95kg
Rated noise level	34dB (29dB eco mode)	34dB	38dB (36dB eco mode)	39dB (37dB whisper mode)	38dB (35dB eco mode)	36dB	36dB
Dimensions (w x h x d mm)	272 x 86 x 210	262 x 98 x 216	245 x 84 x 211	249 x 106 x 327	123 x 85 x 280	198 x 57 x 148	198 x 57 x 148
Security tether	Kensington lock	Kensington lock	Kensington lock	Infocus PC Guardian	Kensington lock	Kensington lock	Kensington lock
Speaker	x	x	✓ 2w	✓ 2.5w	✓ 0.5w	x	x
Warranty	Two years (90 days for lamp)	Three years (90 days for lamp)	Two years (90 days for lamp)	Two years (90 days for lamp)	Three years (six months for lamp)	Three years (90 days for lamp)	Three years (90 days for lamp)
SCORES							
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

13iT

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1 Click BIOS Update

EQ

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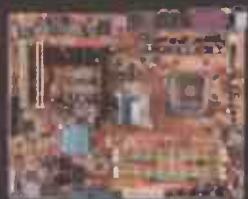
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Hear the difference- Intel® High Definition Audio,
Remember the difference-Intel® Matrix Storage Technology

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- PCI Express, 8 x USB 2.0, 3 x IEEE 1394
- ABIT uGuru™
- ABIT SoftMenu™
- ABIT AutoDrive™

AG8



- Supports Intel® Pentium 4 processors supporting HT Technology 5xx sequence
- Intel® 915-P Express Chipset / ICH6-R
- Supports 4 DIMM Dual DDR II 533/400
- 4 x SATA 150 RAID 0/1/0+1 support
- Gigabit LAN, 6-channel audio, S/PDIF In/Out
- PCI Express, 8 x USB 2.0, 3 x IEEE 1394
- ABIT uGuru™
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www.13iT.com.tw

USB SPEAKERS

Philips DGX 220

Great quality but too large to carry around



USB speakers make a lot of sense from a certain perspective. With no need for external power they're perfect for the traveller with a notebook. It's strange, therefore, to see the Philips DGX 220.

Too big to slip easily into a notebook bag, they don't make much sense as travel speakers. As all the notebooks and PCs we've seen over the past couple of years have onboard sound, it makes more sense to opt for a pair of stereo speakers for use at home. That's not to say the sound quality is bad. For the £35 price tag, we thought the DGX 220 speakers were impressive. Powered through the USB port, they can deliver 1w per speaker (2w total).

Simply plugging the speakers in gives decent sound with a good mix between bass and treble. Only turning the speakers up to near maximum volume causes any sound distortion, and high levels of bass aren't handled very well.

However, the speakers are best used with Philips' Sound Agent 2. This application lets you control the output using its simple graphical interface. At the base level, it's used to control volume and bass. Dip further into the software and it can be used to adjust every aspect of the sound.

On the front screen its Qsizzle and Qrumbles. The former boosts

the treble, while the latter boosts the bass. There's also a stereo expansion slider. In the initial position it produces standard stereo sound; move the slider out and it projects the sound in a wider pattern. It makes a substantial difference, although the optimal setting is down to personal preference.

For the money, the sound quality is good, but these are speakers looking for a specific application. Too big to carry around and more expensive than standard stereo speakers it's confusing where they fit in.

David Ludlow

DETAILS

RRP £35 (£29.79 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Philips 0870 900 9070

www.philips.co.uk

SPECIFICATIONS

USB powered • Headphone socket •

Microphone socket • 1w per

channel (2w total) • Sound Agent 2

Software

PROS Software; sound quality

CONS Size

VERDICT

Good-quality sound for the price, but the speakers are too large to carry around and don't appeal to the mass market

PERFORMANCE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

SPEAKERS

Altec Lansing FX6021

Good sound for PCs and TVs, at a price



Surround-sound speaker systems are fairly commonplace with new PCs, but many people don't have the space to set them up correctly. In this case a set of 2.1 speakers is a good choice. Having fewer speakers doesn't mean you have to compromise on quality, as the Altec Lansing FX6021s show us.

The set is designed to sit alongside a TFT using two thin speakers mounted on heavy metal speaker stands. The speakers can also be wall-mounted if you want to use them with a TV or plasma screen.

The speakers connect to the subwoofer using proprietary cables with a DIN-type plug. The cable length will suit most people, but using proprietary cables makes it hard to run the speakers over a longer distance. It may also cause problems if the cable gets broken.

The quality of the speakers is excellent. Each thin speaker contains six 1in neodymium micro drivers, to give a total of 12.

Altec Lansing has implemented its Inconcert technology, which pushes sound forwards and to the side but not up or down. This cuts distortion caused by sound bouncing off the ceiling and floor.

The sound was crisp and the speakers don't fall prey to the common problem of the

subwoofer drowning out the speakers. Higher frequency sounds can be heard clearly from both satellite speakers.

The bundled remote, which slots neatly into the external control pod, gives you full control of the speakers. In addition to volume control, there is bass and treble, so you can fine-tune the sound.

However, at £200 these speakers are fairly pricey, so if all you're after is something to sound Windows beeps and blurps we'd suggest looking elsewhere.

David Ludlow

DETAILS

RRP £199.95 (£170.17 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Euro Tech 0870 460 6060

www.alteclansing.co.uk

SPECIFICATIONS

75w RMS • Signal-to-noise ratio

>75dB • Six 1in neodymium micro

drivers • 6.5in long-throw woofer •

216 x 198 x 406mm (w x d x h)

PROS Sound; good build quality

CONS Proprietary speaker cables;

no digital input

VERDICT

A little pricey, but the FX6021 pump out great sound for PCs and TVs alike

PERFORMANCE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

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- Supports IDE RAID 0,1 / ATA133
- Supports Intel® Graphics Media Accelerator 900 (Intel® GMA 900)
- Supports 8 x USB 2.0

FSB 800 Dual LAN Serial ATA PCI Express



PX925X / Pro (Mars Series)

Intel® 925X Express Chipset

- Supports Intel® Pentium® 4 Processor (Prescott)
- Socket 775 with FSB 800 MHz
- Intel® Hyper-Threading Technology Support
- Supports Dual Channel DDR2 400 / 533 Memory
- Supports 1 x PCI Express x 16, 2 x PCI Express x 1, 3 x PCI Slots
- Supports Intel® High Definition Audio (8 Channel)
- Supports Marvell Gbit Ethernet LAN & VIA 10 / 100 Ethernet LAN
- Supports 4 Serial ATA150 Channels, Serial ATA RAID 0,1 (Optional)
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- Supports 8 x USB 2.0

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Albatron

MOBILE PHONE

LG U8110

A great phone if you're into video calling



After a shaky start, 3 has managed to improve its handset line. The latest 3G phone for the network is the LG U8810, which comes with a digital still and video camera. As is common with clamshell phones, the U8810 has a secondary screen on the outside for caller ID and text message notification.

Part of the 3 service is videoconferencing, which the U8810 handles admirably. During a video call, you appear in a small window at the bottom of the high-colour screen. The video might not be silky smooth, but it's an improvement on the handsets used when 3 launched.

Video can also be downloaded via the 3 network. In addition to the standard video, which is stored on the phone, there's now the Quickplay service. This streams video over the network, so you don't need to fill up the phone's valuable 16MB of memory – we were impressed with the quality.

If video's not your thing, the camera can be swivelled 180° and used to take still photos. With a VGA resolution of 640 x 480, the U8810 can't compete with similar phones on Vodafone, but it's a fun feature.

An important addition to any phone is the ability to synchronise data with a desktop PC. With the LG it's easy thanks to the provided USB cable. Used

with PC Sync software, calendar and contact information is synchronised with Outlook or Outlook Express.

There's no Bluetooth, so you can't wirelessly transfer information or, for example, connect a PDA to the Internet.

The phone is simple to use with its intuitive menu system, and there's no problem accessing the more complex features. If this doesn't interest you then the LG U8110 is still a good phone for standard voice calls, especially as 3 has some competitive tariffs.

Sameena Shami

DETAILS

RRP From £49, depending on contract

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

3 www.three.co.uk

SPECIFICATIONS

95.7 x 23.1 x 49.5mm (h x d x w) • 126g • USB • Infra-red • 2.2in screen (220 x 176 resolution) • Mp3, mpeg4 and AAC playback • Digital camera (640 x 480 still, 176 x 144 video)

PROS Clear screen and video

CONS No Bluetooth

VERDICT

This is a great phone for anyone who wants to get into the world of video calling

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

MP3 PLAYER

Creative Muvo Slim

An ultra-thin model with an FM tuner



Creative now has a wide range of Flash media mp3 players, and the latest to join the line-up is the Muvo Slim. As its name suggests, the key feature of this model is that it's particularly thin – not quite credit card size, but at just 7.6mm thick, it won't have any problem slipping in to your pocket. Weighing just 34g, you'll hardly notice it's there.

A total of 256MB of Flash memory is available, which equates to around 60 mp3 or 120 wma tracks. If you're listening through in-ear headphones, you probably won't notice the slight drop in quality between the lower bit-rate wma and mp3.

This memory isn't expandable, which may be enough to strike it off many shopping lists, especially with high-capacity Ipods offering far greater storage.

Along with the voice recorder and equaliser features that are found on previous Muvo devices, Creative has also included an FM radio. The lack of a devoted aerial means you need a strong signal to get reception, but it's a useful feature that's missing on many other mp3 players.

A removable battery slots neatly into the side of the Muvo Slim and will charge itself whenever you hook it up to your PC via the USB cable. Although this lithium-ion unit helps the Muvo Slim keep its

slender dimensions, it also means that if you run out of power and don't have access to a PC, you're stuck without music for a while. On a full charge, the battery is able to deliver around 16 hours worth of playback.

Retailing at just under £150, the Muvo Slim is a little on the expensive side, especially when you compare it to a 15GB Ipod that costs an extra £100 but offers more than 50 times the storage. However, the Muvo Slim is far smaller and sports an FM radio.

Will Stapley

DETAILS

RRP £149.89 (£127.57 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Creative

www.europe.creative.com

SPECIFICATIONS

256MB • USB2 • FM tuner • Built-in mic • 5-band equaliser • Li-ion battery • 34g • 1yr warranty

PROS Small; FM radio

CONS Expensive; needs USB to charge

VERDICT

A little on the expensive side, but it's both small and light while also featuring an FM radio

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

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Intel® 915G

EXPRESS CHIPSET

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- Intel® High Definition Audio
- Intel® Matrix Storage Technology



XC Cube EX915

Model		EX915
CHIPSET		Intel 915G+ICH6
MEMORY	TYPE	Dual Channel DDRx2
	DDR	333/400
CPU	TYPE	Socket T LGA775 (Support Intel Pentium 4 with HT Technology, up to 3.4GHz, Prescott FSB533/800)
	FSB	533 / 800
VGA	CHIPSET	Intel 915G OnDie
	Port	x1
CPU Thermal		AOpen Proprietary Heat Pipe
PCI Slot / PCI Express x16 Slot		x1
LAN		10 / 100 / 1000
USB		2(Rear) / 2(Front) / 4(On Board)
IEEE 1394		1(Rear) / 2(Front 4pin and 6pins)
CHASSIS	5.25" / 3.5" / 3.5" HDD bay	x1
Power Supply		275W (W/8CM FAN)



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PHOTO PRINTER

Epson Picturemate

A simple product with impressive results



The Epson Picturemate Personal Photo Lab is a mini inkjet designed to produce professional-quality prints. It measures less than 6in in height and 10in in width, and features a handle so you can carry it to and from different locations. Epson has obviously gone to great pains to ensure its portability, but some users may not be convinced about its styling because, from some angles, it looks like a toaster.

Setting it up is as easy as installing any standard printer. Simply slot the ink cartridge into place and lock into position using a sliding lever, then load the paper into the front-facing feeder tray. An assortment of control buttons at the top of the unit can be used to navigate through an LCD menu, from which all the Picturemate's functions can be controlled.

Getting your images onto the Picturemate is simple. It supports 12 types of memory card and has a USB port on the rear that can access images directly from your digital camera or USB Flash drive.

We printed several test images, each of which took around two minutes to complete. Provided your original snaps are of a high quality, the Picturemate produces borderless snaps that are on a par with professional

results. These were resistant to smudging and water spills, and Epson claims they can last up to 100 years without fading.

The cost of owning the Picturemate is reasonably low. The package includes a batch of 10 x 15cm photo paper and an ink cartridge, but replacement packs of 100 sheets and an ink cartridge cost £29.99, giving a cost per photo of around 29p.

Good photo inkjet printers can produce similar results, but the simplicity of the Picturemate makes it a useful tool for any digital camera enthusiast.

Rory Reid

DETAILS

RRP £149 (£126.81 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Epson

0800 220 546

www.epson.com

SPECIFICATIONS

Resolution 5,760 x 1,440dpi • Paper handling 20 sheets of 10 x 15cm • 256 x 305 x 163mm (w x d x h) • 2.7kg

PROS Great results

CONS Not as cheap as professional photo labs

VERDICT

The Epson Picturemate produces excellent results and makes a great accompaniment to any digital camera

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

INKJET PRINTER

Lexmark Z815

An affordable printer that does the basics



Lexmark recently declined to enter our high-end photo printer group test.

The reason it gave was that it wanted to concentrate on the sub-£150 market rather than try to topple the big three (Canon, Epson and HP) from the professional market. It therefore comes as no surprise that its latest photo printer is priced at just £80.

In the past, we've seen Lexmark printers that look as if a special effort has been made to make them extra bulky. Thankfully, the new Z815 has broken away from this trend and has a far sleeker appearance. However, the slide out-tray is flimsy.

Basic text output was acceptable but not outstanding. The text wasn't as well defined as we've seen from similarly priced printers. Colour photo printing, on glossy paper at the highest quality setting was reasonably good, but nothing special. The prints lacked fine detail, and colours weren't quite as vibrant as we might have hoped.

The black cartridge can be taken out and replaced with a three-colour photo cartridge, providing six colours to print with. Although the output quality was better with the photo cartridge, it didn't result in the improvement we'd hoped for.

The black cartridge is £13.80, while the colour cartridge comes

in at £12.56 and the optional photo cartridge at £15.69.

It took a little under five and a half minutes to print an A4 photo without the photo cartridge, and double that when printing in six-colour mode. If you're only going to be printing large images once every so often, it's not much of an issue.

For the price, the Z815 is not bad. It produces adequate colour photos and, with its auto paper detection system and alignment features, it's also easy to use.

Will Stapley

DETAILS

RRP £79.99 (£60.08 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Lexmark 0870 444 0044

www.lexmark.co.uk

SPECIFICATIONS

Thermal inkjet • 20ppm colour, 14ppm mono (draft) • 4,800 x 1,200 on glossy photo paper • Four-ink printing (six with photo cartridge) • USB2 • 3,000 pages per month duty cycle • 152 x 440 x 230mm (h x w x d)

PROS Easy to use; reasonable output

CONS Very slow printing photos

VERDICT

Those wanting high-quality prints will have to spend more money, but the Z815 would suit most home users

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

Proactive



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- Hear the difference - ■ Intel® High Definition Audio
- Remember the difference - ■ Intel® Matrix Storage Technology

ASUS AI Proactive Motherboards

P5AD2 series

Intel LGA 775 CPU
Intel 925X + ICH6R
DDR2 533



P5GD2 series

Intel LGA 775 CPU
Intel 915P + ICH6R
DDR2 533



Value PCI-Express bundle coming soon
P5GD2 motherboard + EAX800XT Platinum/2HDTV graphics card

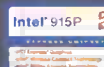
P5GDC-V series

Intel LGA 775 CPU
Intel 915G + ICH6R
DDR2 533 / DDR 400



P5GD1 series

Intel LGA 775 CPU
Intel 915P + ICH6R
DDR 400



Value PCI-Express bundle coming soon
P5GD1 motherboard + EAX600XT/TD graphics card

DIGITAL RADIO

Pure Digital The Bug

Digital radio gets funky looking



Looking like the result of a drunken night between *Short Circuit's* Johnny Five and a Scutter from *Red Dwarf*, The Bug digital radio is likely to offend as many people as it attracts. We quite liked its styling, although we admit it is a touch on the large side.

If you can get past its retro looks, it appears to have plenty to offer. Top of the list are the USB connection and Secure Digital (SD) card slot. The SD card slot lets you timeshift radio, while the USB port gives you a way of downloading recordings to your PC. You can also play mp3 files stored on an SD card.

It all looks good until you try and use the appalling interface. The first problem we had was trying to turn up the volume. There's not a single button marked volume anywhere on the chassis, which is quite an oversight. We had to read the manual to perform this simple function.

The Bug will automatically locate all the digital stations and organise them by name. However, there's no simple way to build a list of favourites. A list exists for this purpose, but it only gets populated by the stations you have listened to the most, not by your choice. This is another oversight and makes The Bug difficult to use.

The rest of the menu system is equally bad, and it's very hard to

navigate through submenus, as it's not always clear how to move up or down a menu. It doesn't help that the soft buttons aren't labelled well on screen.

It's frustrating to see a product that has so much wrong with it, especially when half the point of digital radio is how easy it is to use. It's a shame to see functionality go to waste.

That said, the sound quality is fairly good for such a device, but the nightmarish interface relegates The Bug to being just an interesting product to look at.

David Ludlow

DETAILS

RRP £149.99 (£127.65 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Pure Digital

01923 260 511 www.pure-digital.com

SPECIFICATIONS

SD Card slot • USB port • DAB digital radio • Timeshift function

PROS SD card slot; USB port

CONS Interface; price

VERDICT

An interesting product ruined by its appalling interface. There's no excuse for making it so hard to use

PERFORMANCE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

PEN INPUT

I-pen Mouse

An alternative to a conventional mouse



We were a little nervous about opening the box containing the I-pen Mouse when it arrived at our offices. A fearful warning read: 'The opened or cut edges will contain sharp edges, which will lacerate skin and cause deep and severe wounds.'

Thankfully, we survived the ordeal and got the pen up and running with very little fuss and no lacerations to speak of.

It's designed to replace the mouse, with pen input along the same lines as used on a Tablet PC, albeit using the specially designed mouse mat rather than a touchscreen. It's poorly designed and wouldn't even sit flat on the desk, as it had been curled in the packaging.

It can be quite difficult to use, and holding the I-pen Mouse certainly didn't feel like we were using a real pen, especially with the USB cable dangling from the top.

Despite our best efforts, the handwriting achieved using this product looked more like something you'd expect to see in a primary school. We also found that it was particularly hard to write in a straight line, leaving the text somewhat slanted.

The I-pen Mouse can operate as both a pen and a mouse, allowing you to drag and drop files and then leap into scribbling directly onto

a web page. One problem we found was that, when attempting to depress the pen to open a folder, the cursor would move down making precise actions slightly difficult.

While we can see that some people might find the I-pen Mouse interesting as a source of fun, we really can't envisage it being useful in real-life applications. If you could use it to write directly on the screen then it would have its uses but, as it stands, it's not something we see really catching on.

Will Stapley

DETAILS

RRP £49.99 (£42.54 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Finger System

0870 042 1305

www.fingersystem.com

SPECIFICATIONS

800dpi • USB powered • 22g

• 142 x 15 x 21mm (h x d x w)

PROS Could be fun for kids

CONS Performance; hard to use

VERDICT

Could hold your interest for a few minutes, but we can't see it being successfully used in many applications

PERFORMANCE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

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Support 800FSB, Dual Channel DDR2-533 Memory and PCI Express x 16

4 DDR2 Slots / 3 PCI Slots / 2 PCI Express x 1 Slots

Karajan 8CH Audio (with Intel® High Definition Audio) / 4 SATA / RAID

Dual GbE LANs / 2 1394 Ports / 8 USB Ports / ATX



LANPARTY UT 915P-T12

Intel® 915P + ICH6 Express Chipset delivering excellent performance for the high-end desktop system

Supports Intel® Pentium 4 processors supporting HT Technology 5x sequence

Support 800FSB, Dual Channel DDR2 & DDR Memory and PCI Express x 16

2 DDR2 + 2 DDR Slots / 3 PCI Slots / 2 PCI Express x 1 Slots

Karajan 8CH Audio (with Intel® High Definition Audio) / 4 SATA

Dual GbE LANs / 2 1394 Ports / 8 USB Ports / ATX

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- PCI Express® Graphics
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Design for Innovation

SMALL BUSINESS SERVER

Ayrsoft Icon Server

A small form factor, Linux-based system



Small form factor PCs have been around for some time, but only enthusiasts have converted these into servers. This has changed with Ayrsoft's Icon Server, which hosts a number of applications within a Shuttle box.

Our review system was powered by an Intel P4 2.4GHz processor. The twin 80GB hard drives were mirrored for redundancy and 512MB of PC2700 Ram was installed. Because of the case's size, there are only two available memory slots and a single PCI slot.

The hardware configuration is designed to cope with more than 24 users, while the base operating system is a customised version of Mandrake Linux. There is no need to know Linux, though, as the unit is managed via a secure web browser connection.

A wizard guides you through the installation and, once completed, the well-designed web-based management screen lets you configure additional options. This takes a few minutes, after which the office software can be managed. This includes applications such as intranet, email, file sharing, firewall and VPN support. It can also run a MySQL database. Distributed Internet will soon be available, and automatic upgrades from Ayrsoft can be scheduled every night.

There are several versions of the Icon software, from a starter pack to a Plus edition, which includes options such as anti-spam filtering. Additional subscription services can be purchased, and bespoke applications can be incorporated.

It's a powerful system that can be managed easily. Expansion is restricted to three Firewire and four USB ports, while the Linux operating system may limit support for peripherals.

Alex Arias

DETAILS

RRP £3,288.83 (£2,799 ex VAT) for a 50-user licence

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Ayrsoft 01294 318 772

www.xayrsoft.com

SPECIFICATIONS

Pentium 4 2.4GHz • 2GB • Two Ethernet ports • One PCI slot • 2 x 80GB hard disks • Email, firewall, web, print server (additional extras available) • One-year RTB warranty • 200 x 285 x 185mm (w x d x h)

PROS Easy to set up; compact
CONS Hardware upgrades limited

VERDICT

A versatile, easily managed small form factor Linux-based server system, with limitations for hardware expansion

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

WIRELESS BROADBAND ROUTER

Inexq ISW054u

All the basics covered at a good price



As broadband grows in popularity, the combination of a high-speed Internet connection and wireless networking becomes even more appealing. Inexq provides this functionality with the ISW054u, designed for home or small office use with a cable or Ethernet-based ADSL modem.

Its silver casing includes a firewall, four-port Ethernet switch and USB printer port. The wireless access point is based on the 802.11g standard.

Installing the device is straightforward. The manual will give you the default IP address, which can then be used to connect to the browser-based management interface.

The interface won't win any awards for design, but it is easy to navigate to configuration pages with a mouse click or two. The basic wizards will get you onto the Internet quickly although they won't guide you through the wireless Lan setup.

A built-in DHCP server automatically allocates IP address to both wired and wireless clients. IP filtering can be implemented, which means you can manage traffic based on IP addresses and basic web filtering can be applied, but there's no anti-virus option.

Wireless security is based on Mac address filtering and the ability to prevent the broadcast of SSID. Standard Wep encryption is

supported up to 128bit. Wireless distribution system (WDS) can be implemented to aggregate extra access points. The online help does a reasonable job of explaining terms, and some of the more advanced features, such as Virtual Server and multiple DMZs (Demilitarised Zones), can be set up with ease.

Its management screen may not be as slick as others, but its core functionality and price make it a solid and attractive entry-level product.

Alex Arias

DETAILS

RRP £52.87 (£45 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Inexq

www.inexq.com

SPECIFICATIONS

Firewall • DHCP server • TCP/IP printing • Four Ethernet ports • One Wan port • USB1.1 printer port • 802.11G • One-year RTB warranty

PROS Attractive; low price

CONS Printer support for Windows only; basic firewall

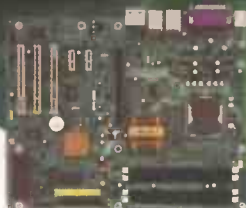
VERDICT

The Inexq has all the basics covered at a low price, although you might want a more expensive router if you need more control over the settings

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



[Wind]



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- Intel® 915G+ICH6R chipsets
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- 2 P-ATA ports with RAID 0, 1, 0+1 support
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- Gigabit LAN
- Support Intel® Matrix RAID Technology

ER-5LWA+



- Intel® 925X+ICH6R chipsets
- Support P4@1066 MHz FSB in LGA775 socket
- Intel® Hyper-Threading Technology Support
- 4 Dual Channel DDR2 DIMMs for DDR2-400/533
- Turbo Mode Technology
- 1 PCI Express x16; 2 PCI Express x1; 3PCI
- 8 USB 2.0 ports; 2 1394a ports
- 2 P-ATA ports with RAID 0, 1, 0+1 support
- 4 S-ATA ports with RAID 0, 1 support
- Dual PCI-E Gigabit LAN
- Support Intel® High Definition Audio
- Support Intel® Matrix RAID Technology

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GRAPHICS CARD

Gigabyte GV-NX57128D

The first low-end PCX graphics card



Since the early 1990s when the PCI bus first found its way onto a motherboard, very little has changed inside your PC in terms of how your data moves. AGP and DDR were technologies developed to get around the limitations of the old PCI bus running at 33MHz (133Mbytes/sec of data). Now all is set to change with the introduction of PCI Express and the PCX 16x graphics slot which will provide bandwidth of around 4Gbytes/sec.

Based around Nvidia's GeForce PCX 5750 GPU (NV36 core), the GV-NX57128D from Gigabyte is the first PCX graphics card we have seen and is aimed at the lower end of the market.

On this card, the GPU is positioned further up the circuit board than on standard FX5700s just to make room for the HSI bridge (Nvidia's cards are not natively PCX and use a bridge instead). Apart from the HSI bridge, the specifications remain the same as the standard

FX5700 with a 425MHz DDR core, a 128bit memory bus and 128MB of memory running at 550MHz DDR (1.1GHz). Because of these relatively low speeds there is no need for cooling.

Performance-wise the PCX interface offers no discernable advantage over the AGP version of the FX5700 – 3,206 for 3Dmark03 and 41.85fps in Far Cry when tested at 1,024 x 768 pixels, but it is early days.

Based on this, it's not really worth upgrading to PCX until much faster cards are launched.

Simon Crisp

DETAILS

RRP £111.27 (€94.70 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Gigabyte www.gigabyte.com.tw

SPECIFICATIONS

425MHz core • 128MB of DDR memory running at 550MHz • 128bit memory architecture • 16x PCI Express interface • DirectX 9

PROS First example of the latest graphics technology

CONS Not the fastest card around

VERDICT

While PCX is the future for graphics cards, this rehash of an old design isn't enough to persuade anyone to make the upgrade

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

PERFORMANCE



MOTHERBOARD

Gigabyte GA-8GPNXP Duo

Launching a new 775pin socket chipset



The Gigabyte GA-8GPNXP Duo is the first motherboard we've seen to use Intel's new i915P chipset. It supports 800MHz FSB Pentium processors, DDR2 memory and PCI Express cards. When supporting graphics cards, PCI Express provides more than 3.5 times the bandwidth of AGP 4x.

The new chipset has a 775-pin socket, a radical departure from the 478-pin socket. Gone are the pins on the back of the processor, as they now make up part of the motherboard.

Gigabyte's board makes use of the new chipset offering two types of Dimm slot: DDR and DDR2. So with a new processor and graphics card you can use your old DDR400/333 memory.

The specifications for the new chipsets only include a single ATA port. If you don't have SATA (Serial ATA) you can only chain a single optical drive off your hard disk. Gigabyte provides two ATA Raid ports on the board which can be switched to normal ATA function for hard disks.

As well as a new processor, you will have to buy a new graphics card, as the only option on the board is a 16x PCI Express graphics slot. For expansion cards, there are two normal PCI and three 1x PCI Express slots. Integrated onto the board are two Gigabit Lan ports and 7.1 surround sound.

It's a great board to launch the new chipset, although the small number of PCI Express graphics cards and harsh upgrade requirements can be offputting.

Simon Crisp

DETAILS

RRP £162 (€137.88 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Gigabyte

www.gigabyte.com.tw

SPECIFICATIONS

Socket 775-pin • Pentium 4 (800/533MHz) • Intel i915P chipset • 4 SATA • 2 PCI slots • 3 1x PCI Express slots • 7.1 audio

PROS Lots of features

CONS Expensive option to upgrade to; needs new processor and graphics card

VERDICT

A well-featured, future-proofed board to build a system around. The new chipset offers plenty of performance and all the latest Intel technology

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

PERFORMANCE



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P4M-915GD1



- Intel® 915G Express Chipset
- Supports Intel® Pentium® 4 processors supporting HT Technology 5xx sequence
- 4 Dual-Channel DDR 400/333; up to 4GB
- 1 PCI-E x16, 3 PCI
- 4 SATA support RAID 0, 1
- Realtek 10/100/1000 LAN
- 8 Channel Audio Codec & Intel® High Definition Audio in ICH 6 Chipset
- Intel® Graphics Media Accelerator 900
- Supports 1394 x 2, USB 2.0 x 8
- microATX Form Factor



PCI EXPRESS®



P4M-915GD2



- Intel® 915G Express Chipset
- Supports Intel® Pentium® 4 processors supporting HT Technology 5xx sequence
- 4 Dual-Channel DDR2 533/400; up to 4GB
- 1 PCI-E x16, 1 PCI-E x1, 2 PCI
- 4 SATA support RAID 0, 1
- Intel® 10/100/1000 LAN
- 8 Channel Audio Codec & Intel® High Definition Audio in ICH 6 Chipset
- Intel® Graphics Media Accelerator 900
- Supports 1394 x 2, USB 2.0 x 8
- microATX Form Factor



PCI EXPRESS®



First International Computer, Inc.

<http://www.fic.com.tw>

email: mkt@fic.com.tw

▼ Tagan TG480-U01

Well built with a great attention to detail, Tagan's TG480-U01 is a 480w power supply which, despite using two fans for cooling, only has a quoted noise level of 20dBA at 60 per cent load. At light loads it uses only one of the fans, making it quieter still. It comes with a 24-pin to 20-pin ATX converter, eight 4-pin Molex pins, two floppy connectors and two Serial ATA connectors.

RRP £70.43 (£59.94 ex VAT)

PRODUCT INFORMATION www.overclock.co.uk

★★★★★



▲ Buffalo Memory

Well known for its range of wireless products, Buffalo Technology has also been in the memory business for some time. The product range includes SD-Ram, DDR, Rambus and the newly announced DDR2.

RRP 512MB module DDR400 (PC3200) £63.52 (£54.06 ex VAT)

PRODUCT INFORMATION www.techstore.co.uk

★★★★★



▲ Corsair XMS 3200XL (CMX512-3200LPT)

The latest memory modules from Corsair are the XL range. These are currently the fastest modules in Corsair's ever expanding line-up and the fastest available anywhere at the moment. What makes these modules special are the latency timings of 2-2-2-5. The lower the latency, the faster the memory performance. The XL range is available either as separate modules or as TwinX matched pairs.

RRP Single 512MB PC3200 module £126.31 (£107.50 ex VAT)

PRODUCT INFORMATION www.overclockers.co.uk

★★★★★

▼ Zalman ZM-MFC 1 Controller

Part of Zalman's Computer Noise Prevention System (CNPS) the ZM-MFC 1, six-channel fan controller is just the thing if you have a case full of fans and no way to control them. Designed to fit into a 5.25in bay, the ZM-MFC 1 uses LEDs to display fan speeds.

RRP £23.42 (£19.93 ex VAT)

PRODUCT INFORMATION www.overclock.co.uk

★★★★★





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GA-BANXP-D



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- 8Σ Series
- U-Plus D.P.S
- Wireless LAN
- DDR2 533
- PCI-Express
- Dual Gigabit LAN
- IEEE 1394b
- Intel High Definition (HD) Audio

GA-B6PNXP Duo



- Intel® 915P
- 8Σ Series
- U-Plus DPS
- Wireless LAN
- Duo DDR Design
- PCI-Express
- Dual Gigabit LAN
- IEEE 1394b
- Intel High Definition (HD) Audio

GA-B1915P Duo Pro



- Intel® 915P
- Duo DDR Design
- PCI-Express
- Dual Gigabit LAN
- G.E.A.R
- IEEE 1394
- ATA133 RAID
- Intel High Definition (HD) Audio

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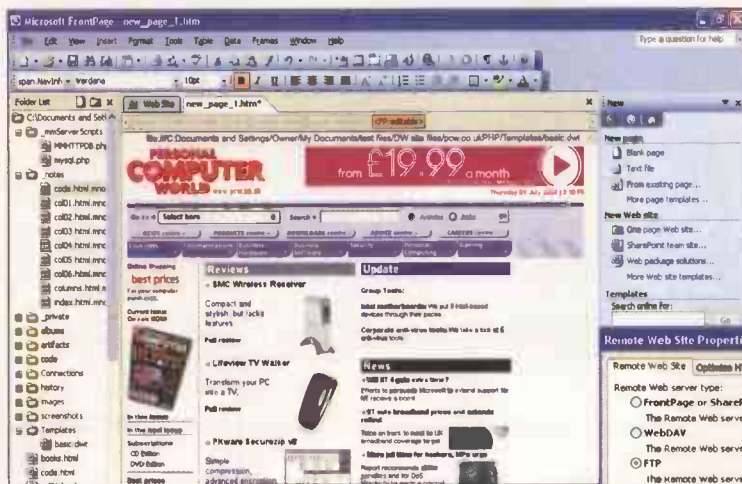
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WEB DEVELOPMENT

Microsoft Frontpage 2003

This revamped web-editing tool looks to extend its appeal



Left: You can use Dreamweaver templates in Frontpage 2003, but overlapping area titles obscure the text you're entering

Below: FTP support is flaky, with absolute paths needing %2F at the beginning

Microsoft's Frontpage 2003 is the latest version of its web-editing tool. A first glance clearly shows the influence of Macromedia's Dreamweaver, with the split view that shows code alongside your design, and code completion for tags, along with colour coding. There's the same sort of quick previewing in a range of web browsers, which allows you to specify the window size you want. You can even open Dreamweaver templates and use them directly.

When it comes to design, there's accurate layout and the ability to use a background image to trace over, which is useful if you want to create a website from printed material, or a design mocked up as a single graphic. There's an accessibility checker, too, to help make sure your site can be viewed by everyone.

There's a useful authoring preferences panel where you can disable specific features, to make sure you don't inadvertently create a site that only works with some browsers or servers. This was something of a nuisance in earlier versions of Frontpage, as it wasn't altogether clear that elements added to the site wouldn't work on an ordinary web server.

There are some other good touches too. Drop a picture on

the page and you can drag to resize it and the proportions are maintained. You can then choose whether or not the picture is simply scaled by tags, or resampled to fit the new size; choose the former and the original is untouched. An auto-thumbnail option makes short work of that task too.

There's good support, of a type, for XML data sources. You can fairly quickly create a site that loads information from elsewhere on the web and, for example, displays a news story in a pane depending on which headline's been clicked in another. XML files can be opened and validated – although only in the sense that tags match properly – or reformatted. But, these features rely on the site being hosted on Windows Server 2003. Unlike Microsoft, we don't feel that such hosting is really widespread. Nor does Netcraft (www.netcraft.com), whose June survey had Apache on 67 per cent and Windows (all versions) on 21 per cent.

That makes it even more annoying that all the data-driven features are reliant on a Sharepoint server, although, if you have such a system, the integration is undoubtedly good, but what of those who

want to use MySQL and PHP? Tough. The help on PHP tells you to use ASP-style tags, edit the server's PHP.ini file, make various other manual changes to Frontpage settings and then suggests you really should be looking at ASP.Net. Forget MySQL support. Indeed, you should probably forget Frontpage 2003 if you want to use such technologies.

The reliance on Sharepoint also seems to have blinded Microsoft to the foibles of sites that you upload by FTP and, unlike Dreamweaver, there's no support for SFTP either. The site settings don't appear when you create a new site, and they are a bit strange for FTP uploads. Even a server path beginning with a / is treated as a relative one, and relative paths are displayed in some dialogues as if they're absolute. To enter a path such as /home/sites/ you need to specify %2Fhome/sites/ which is rather odd. There's no clear indication of what's happening and FTP seems generally sluggish too.

Other niggles include the labelling of editable areas in templates. With areas close together, the labels can overlap another zone and obscure what you're typing. After updating our Dreamweaver template, only the page created in Frontpage was changed; all the others were detected, but not updated and with no explanation.

Frontpage has undoubtedly made great strides in some areas. The built-in accessibility checker is a boon. The integration with Sharepoint lets you set up new sites or create weblogs easily. But if even half the Windows servers on the net have upgraded to the latest version, that's only 10 per cent. So there's a good chance your site's not hosted on Sharepoint, and you'll be stuck with a clunky FTP system and poor support for common languages such as PHP or tools such as MySQL. You also miss out on the built-in reference tools Macromedia provides. Frontpage may be half the price, but Dreamweaver is twice as good.

Nigel Whitfield

DETAILS

RRP £169.99 (E144.67 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Microsoft 0870 601 0100

www.microsoft.com/uk

SYSTEM REQUIREMENTS

Windows 2000 or XP • Pentium III or higher recommended • 128MB of Ram • 180MB of disk space • Requires Microsoft Sharepoint-equipped web server for data-based sites

PROS Good integration with

Sharepoint services; support

for remote XML data sources

CONS Confusing FTP support; poor support of PHP; too reliant on Microsoft web servers

VERDICT

Worth a look if you have access to Windows 2003 server, but it still trails behind Dreamweaver

EASE OF USE

★★★★★

FEATURES

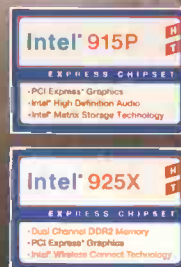
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VALUE FOR MONEY

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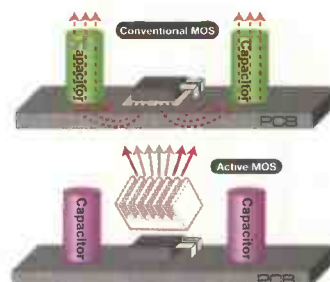
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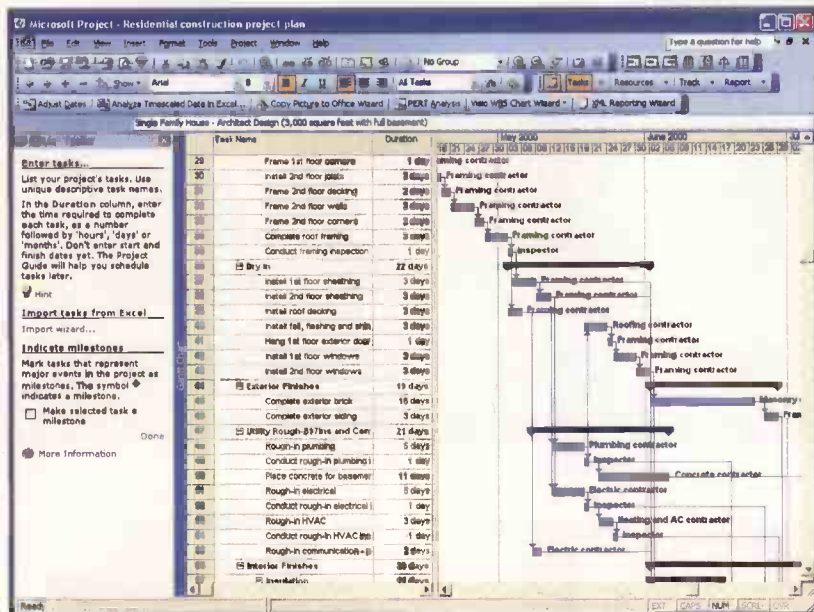
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PROJECT MANAGEMENT

Microsoft Project 2003

Microsoft's project management tool gets the Office 2003 makeover



Project 2003's main window is dominated by the task list and Gantt chart view. To the left is the task pane, offering context-sensitive guidance

that have been added or deleted.

Printing has also been improved, with wizards allowing a variety of documents to be output in hard copy form more easily. This enables project related information to be shared more effectively with

team members, project managers or clients while away from the office.

Baseline monitoring tools allow snapshots of the current project to be taken at any point, which is useful for providing historical notes or reference points for subsequent analysis.

It's a fairly daunting program to begin with, but ongoing context-sensitive help is available via the task pane-based interactive Project Guide. It's less obtrusive than the Office Assistant of old, and offers invaluable assistance when performing unfamiliar tasks.

Many aspects of project management can be achieved using little more than a spreadsheet, and an Excel template is included for those who prefer to start by producing a basic task list in Excel and then transferring it into Project later on. It even offers the flexibility to custom map fields if desired.

The exporting of data into Word, Excel, Powerpoint and Visio is simple thanks to the presentation wizard, but the full Enterprise Project Management (EPM) component provides an impressive array of collaborative

features. Project tasks can appear in Outlook's Calendar view alongside appointments, and users can update their progress on Calendar entries and report their status back to Microsoft Project Server directly.

Of course, the full cost of deploying Microsoft's EPM – which requires Project Professional, Office 2003, Project Server, Project Web Access 2003 and Windows Server 2003 – needs to be carefully evaluated. However, the high degree of data integration and of network resource usage look good on paper at least, and offer a useful glimpse of just what can be achieved with Office 2003.

Project 2003 is a powerful tool that provides instant access to the data and analysis crucial to effective project management. Which version to opt for will need careful consideration, but anyone whose job it is to manage projects on a regular basis will quickly find Project 2003 invaluable to their work.

Andy Gibbons

Effective management and monitoring is the key to ensuring that large-scale projects stay on track and within budget. Project 2003, the new version of Microsoft's project management package, offers project managers and planners the tools to effectively organise and manage both small-scale and highly complex projects.

It's available in two versions, both featuring the same core functionality. For the lone project manager, the Standard edition dispenses with many of the collaborative features, while remaining competitively priced. The Professional version, however, offers a number of extra features for those needing to get the best from shared data and resources.

Project 2003 can best be described as a timeline-based scheduling and costing tool. That's an oversimplification of what it does, but those who need to manage simple or complex projects and monitor the tasks, resources and costs along the way will find that Project 2003 has everything covered within one interface. The main interface consists of

the task list and Gantt chart. It's rather like an interactive wall planner that allows tasks to be tracked across selected time slices. Tasks can be prioritised and resources assigned and adjusted to resolve conflicts or over-allocations. Project 2003's scheduling engine makes it easy to change one work item and see how it will affect the rest of the project. Hyperlinks to other documents or web pages can be added to the task list and, with Project Professional, it's also possible to add resources from the Active Directory service or Exchange Server address book.

The basic reporting tools haven't changed a great deal since the previous version. Information can still be bundled together to form groups for easier viewing of key project dates. For example, it's possible to choose a task usage view, and then group by various criteria such as complete or incomplete, giving at-a-glance project updates by category or status.

Keeping tabs on version changes is simple thanks to the Compare Project Versions tool, with easy-to-understand indicators clearly identifying any differences, such as tasks

DETAILS

RRP Standard edition £474 (£403.40 ex VAT); Professional edition £799.99 (£680.84 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION
Microsoft 0870 601 0100

SYSTEM REQUIREMENTS

Windows 2000 (with SP3) or XP • 233MHz Pentium class processor • 128MB of Ram • 250MB of free hard disk space

PROS Simple, but powerful; good integration with Office 2003

CONS Fairly steep learning curve; EPM could be expensive to deploy

VERDICT

A versatile program, with an impressive arsenal of scheduling and analytical tools

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

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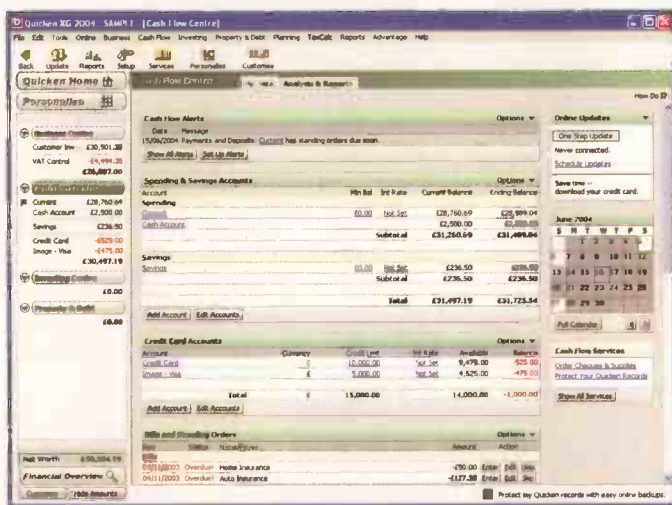
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HOME FINANCE

Quicken XG 2004

A feature-packed financial suite



The main screen of Quicken XG 2004 provides an at-a-glance view of the state of both business and home finances

Home finance packages have long since passed the point where they offer every feature that the average financially astute user could possibly need. Quicken XG 2004 targets the home business user instead, and bridges the gap between its own Money Manager and Quickbooks ranges. As such, it provides tools for VAT tracking, generating estimates, invoices and reports, as well as full support for home finances too.

Initial setup can be a time-consuming affair, regardless of the package, but Quicken makes the process relatively painless thanks to its setup wizard.

The pricing structure has received quite an overhaul. You can buy a new version annually for £59.95 or you can purchase an yearly or monthly subscription, entitling the user to new versions of the software and access to online financial information, forums and Quicken's own specialists. It works out slightly cheaper over 12 months, but looks much less attractive in the longer term.

Backups can be stored online at extra cost, and statements can be downloaded directly from a number of online banking institutions – of the big four,

only Barclays is absent. Taxcalc 2004 (the Lite version is on this month's cover disc) is included and can easily import data directly from the main program.

Those still looking after their finances on paper should consider making the move, but domestic users would be better served by Quicken's Money Manager 2004 at £19.95.

Andy Gibbons

DETAILS

RRP £59.95 (£51.02 ex VAT);
£54.95 (£46.77 ex VAT) annually;
£4.50 (£3.83 ex VAT) monthly

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Intuit 0845 0755 058

www.quicken.co.uk

SYSTEM REQUIREMENTS

Windows 98 or later • 300MHz
Pentium class processor • 64MB of
Ram • 70MB of hard disk space •
Internet connection for online services
PROS Good business features;
Taxcalc 2004 is an added bonus
CONS Interface; additional online
services are pricey

VERDICT

A richly featured package that
should suit home business users

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

PEER-TO-PEER

Steganos Secure File Sharing 6

Keep P2P downloading habits to yourself

Legal concerns notwithstanding, there's no disputing the rising popularity of peer-to-peer (P2P) file sharing services among home users. Opening the contents of your hard disk to all and sundry is not without risk, though, so we were expecting this latest version of Secure File Sharing from Steganos to offer a range of security features.

Like its Internet Anonym product, it's the local privacy of the user that's central, with a password-protected Media Safe to keep downloads hidden.

This encrypted virtual disk can be up to 32GB in size on NTFS formatted disks, but Fat32 limits this to 2GB and 4GB under Windows 98 and ME respectively. As with other recent Steganos products, passwords are checked against a database of commonly used passwords.

The main services, Kazaa, Kazaa Lite, Morpheus, Soulseek, Imesh and Emule are supported, and existing downloads can be moved to the Media Safe during installation. A checkbox within the settings can prevent shared folders from being shared, but some services may not work correctly under these circumstances.

Privacy is further assured by the deletion of usage data such as search phrases and history, which are overwritten using standard data destruction techniques.

It all works well, but we can't help feeling that it is something of a missed opportunity as there are far more pressing security issues raised by P2P, which this program fails to address.

Andy Gibbons

DETAILS

RRP £24.99 (£21.25 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Steganos 00800 7834 2667

www.steganos.com

SYSTEM REQUIREMENTS

Windows 98 or later • Pentium class
processor • 128MB of Ram • 15MB of
hard disk space • Up to 32GB of NTFS
formatted hard disk space for Media
Safe • File sharing program

PROS Good privacy for downloaded
files; encourages safe password use
CONS Not all P2P services
supported; slow trace destruction

VERDICT

If privacy is a concern, it works
well, but more genuine security
features would have been better

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



For added privacy, traces of P2P search and usage history can be destroyed using a number of data overwriting techniques

PRODUCTIVITY SOFTWARE

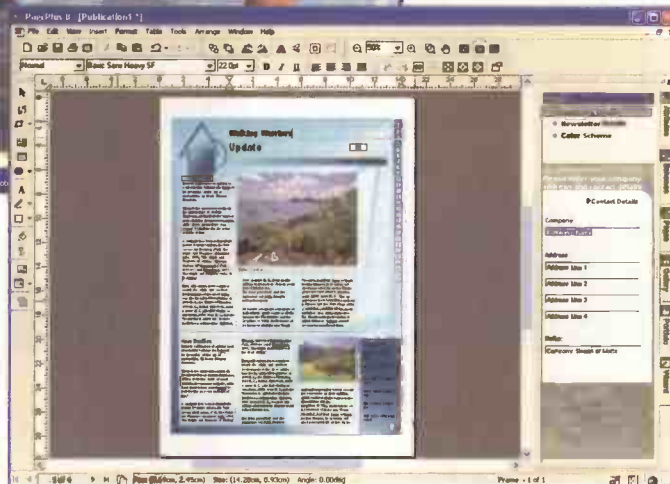
Serif Home Creativity Suite

A wide range of graphics and DTP tools for less than £50



Left: PhotoPlus 7 may be a bit old, but it has some good special effects filters that you can play with

Below: The wizards in Pageplus 8 allow you to quickly create newsletters and a variety of other types of document



Depending on your point of view, Serif's Home Creativity Suite is either a tired marketing ploy or a bit of a bargain. The company is well-known for products such as Pageplus, PhotoPlus and Drawplus, which provide easy-to-use graphics and DTP tools at a competitive price. A bundle that contains all three products for a mere £49.99 would therefore seem to be a real bargain. It's worth noting, though, that these aren't the latest versions of the products.

The Home Creativity Suite is quite a bit behind the times, as it includes the old Pageplus 8, PhotoPlus 7 and Drawplus 5. In other words, most of these programs are two major upgrades or nearly two years, behind the current versions.

Each program is provided on a separate disc, each with its own installer, rather than having a single integrated installer program for the entire suite and two of the three programs insist you enter your company name before you can install them. This is just plain sloppy in a product that's supposed to be aimed at home users.

Initial impressions aren't that good, then. But the Home Creativity Suite still manages to

provide decent value for money. Its three component programs may not be bang up to date but they're still pretty good and, most importantly, easy to use.

PhotoPlus 7 obviously isn't as powerful as some of the newer photo-editing programs now available, but it's a decent entry-level editor and has some fun special effects you can play with. There are several tools such as 'twirl' and 'ripple' that you can use to distort images, and some powerful filters, including a lighting filter that allows you to add multiple light sources that can drastically alter the mood and look of a photo.

It's also got some useful animation features for creating graphics for web pages. But it does need a 'revert' tool that will allow you to instantly discard all changes you've made to an image and its File Browser

has an annoying habit of staying on screen and obscuring any images you try to open, but these are only minor irritants. What it really lacks, though, are tightly focused options such as the 'recipes' in Photoshop Elements to guide you through specific tasks such as removing red-eye or adjusting image sizes.

Pageplus 8 is a good DTP program for first-time users. It has a wizard that allows you to automatically create a variety of documents such as newsletters, business cards and web pages. A 'Studio' pane on the right-hand side of the workspace then allows you to quickly modify options such as the colour scheme, or to add layout elements such as 'pull-out quotes' and text effects for logos. The program also has some good text tools, with simple options for creating drop capitals and handling vertical text. There's an option for creating text

style sheets to ensure consistent appearance of text throughout your documents, although this can be clumsy at times and spreads options across too many dialogue boxes. Pageplus is a good program for creating documents that are just a few pages long, but we wouldn't recommend it for projects any longer than that.

Finally, there's Drawplus, the vector graphics and illustration part of the suite. This provides a good selection of tools for beginners, such as ready-made symbols for creating circuit diagrams, floorplans or computer network diagrams. It also has some more advanced functions, such as a powerful blending tool that can blend one shape into another.

But none of these programs are particularly outstanding, and there's a definite feeling that you're dealing with software that is well past its sell-by date. Even so, at just £49.99 the Home Creativity Suite is still good value for money and will appeal to complete beginners or people who are on a really tight budget.

Cliff Joseph

DETAILS

RRP £49.99 (£42.54 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Serif 0800 376 7070

www.serif.com

SYSTEM REQUIREMENTS

Pentium PC with Windows 98

SE or later • 64MB of Ram

PROS Wide range of graphics and

DTP tools at a competitive price

Cons Old versions of three

programs which are starting to

show their age

VERDICT

Essentially a marketing exercise, but still worthwhile if you need some cheap and cheerful graphics software

EASE OF USE

★★★★★

FEATURES

★★★★★

VALUE FOR MONEY

★★★★★

OVERALL

★★★★★



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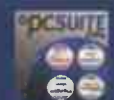
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PC Pro, Recommended & A-List, February 2004

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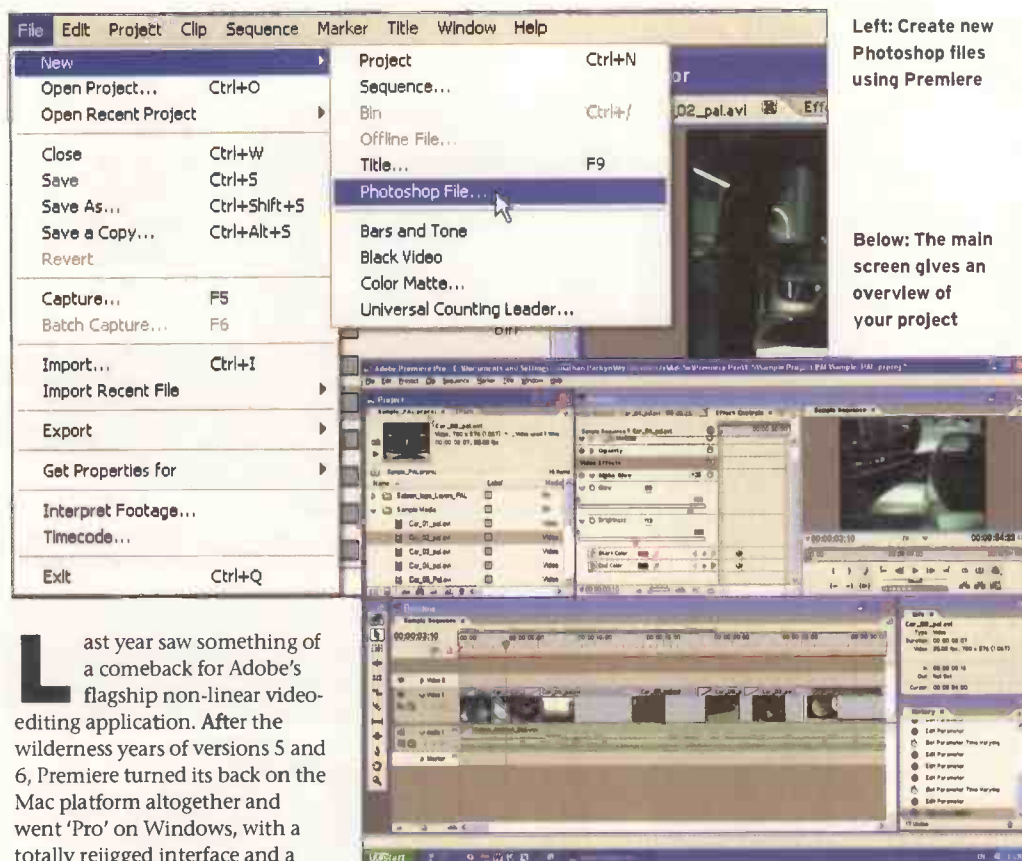
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VIDEO EDITING

Adobe Premiere Pro 1.5

Powerful and professional video editing for Windows



Left: Create new Photoshop files using Premiere

Below: The main screen gives an overview of your project

New features

As mentioned in our preview of the Adobe Video Collection beta in our August issue, one of Premiere Pro 1.5's most useful new features is probably the Project Manager. Most editors have a hard enough time as it is focusing on what's going on in the timeline without having to keep an eye on which source files are being used. The trouble is that, depending on the length and complexity of the project concerned, it's all too easy to let the file management side of things spiral out of control, particularly when making copies of timelines, projects and clips or importing new audio and video into an existing project.

The Project Manager is a simple tool allowing an instant overview of how much space a project is taking up on your hard disk. It can also rename media files en masse to help make them more easily identifiable and can even copy a whole project to a different location. This last ability is particularly handy when it comes to archiving work for posterity, since it can collect all the files that are associated with a project and discard any footage or unconfirmed audio clips that are no longer necessary. Hey presto – an instant backup that's relatively economical on disk space.

Rounding off the new features are several other interesting odds and ends. A couple of useful audio filters (De-hummer and De-esser) help to eliminate any unwanted hum and hiss from poorly recorded sound directly on the timeline – so it's no longer necessary to export soundtracks to a separate program to clean them up. The program has also developed some more Photoshop-like behaviour, such as automatic colour and contrast adjustments and enhanced bezier keyframe motion controls.

Predictably, Premiere Pro's developers croon at length, as

Last year saw something of a comeback for Adobe's flagship non-linear video-editing application. After the wilderness years of versions 5 and 6, Premiere turned its back on the Mac platform altogether and went 'Pro' on Windows, with a totally rejigged interface and a raft of new improvements and features. Since then, Adobe has further developed the program, combining all the latest improvements into this 1.5 version upgrade. Rather than a handful of incremental tweaks, we found that Premiere Pro 1.5 includes a number of useful new features that make the update worthy of consideration.

Like an old rock star who pulls off a good return to form just when it looked like things were all over, Premiere's latest incarnation has been warmly welcomed by desktop video editors – particularly those who haven't already jumped ship to take advantage of the dream team combination of a dual-processor G5 Mac and Final Cut Pro.

The addition of the word 'Pro' in Premiere's title is not without its significance, either. A direct reference to the 'Pro' in Final Cut Pro, Premiere's subtle name change is a not-so-subtle nudge

in the direction of its main rival, showing us where Adobe wants to pitch the product.

It goes without saying that Adobe Premiere Pro is not the ideal application for those new to video editing. That section of the market is more than catered for by the Pinnacles, Uleads and Roxios of this world – all of which now offer some high-end features (timeline editing, colour correction, DVD authoring and the like) alongside automated functions and wizard-based features to help newcomers to the desktop cutting room find their feet. Premiere, on the other hand, is intended for advanced users, semi-pros, professional videographers and film makers of all levels.

Indeed, many of the new features in Premiere Pro 1.5 are aimed specifically at the highest of the program's high-end users.

Something that not many home users will find themselves getting too excited about, for example, is the application's support for a new 24 frames per second DV format.

This feature only affects users of a couple of professional Panasonic video cameras (the AG-DVX100 and the AJ-SDX900), which both employ a proprietary frame rate called 24p Advanced that produces a more film-like look.

Premiere Pro can capture, import and export natively in the format and it's one of the cheapest applications around. Assuming you've got the right hardware, Premiere now also supports other industry-standard formats, such as High Definition (HD), Edit Decision List (EDL) and Advanced Authoring Format (AAF), all of which helps to cement its position as a pro-end editing platform.

Miglia Director's Cut Scart

Premiere, like many desktop video-editing programs, is very much geared towards Firewire, which is fine – assuming you're not one of the millions of people who want to capture footage from a source other than DV. There are, of course, dozens of ways to get analogue footage onto a hard disk, but many of these revolve around installing expensive, finicky PCI hardware and proprietary codec combinations.

Editors who already have Firewire fitted to their computers could take advantage of a video digitiser, such as Miglia's Director's Cut Scart. This external device's built-in digitising board converts analogue audio/video (from camcorders, VCRs and DVDs) to a standard DV signal that can be captured to a PC or Mac via Firewire. Usefully, Director's Cut works both ways – finished edits can be exported through the box to an analogue recorder, such as VHS.

We looked at a previous version of the product back in the April Issue, and this one is practically identical other than the fact that it swaps the composite analogue video input/output socket for a bidirectional Scart socket. Scart is a more common connection type and its inclusion here offers some minor quality benefits. We'd still recommend using the device's S-video socket in preference, if at all possible. The real bonus is that it's much cheaper than the original version of the product.

Price: £200 (£170 ex VAT)

Contact: Miglia 0870 7472 988 www.miglia.com

they so often do, about the program's 'unparalleled integration' with other Adobe applications. In this instance, however, the company might just have a point. Version 1.5's 'tight' association with its sister applications extends to such joys as the ability to work with Premiere keyframes and layers across specialised platforms such as Photoshop CS and After Effects 6.5 which, among other things, saves an awful lot of hassle importing, exporting, rendering and flattening.

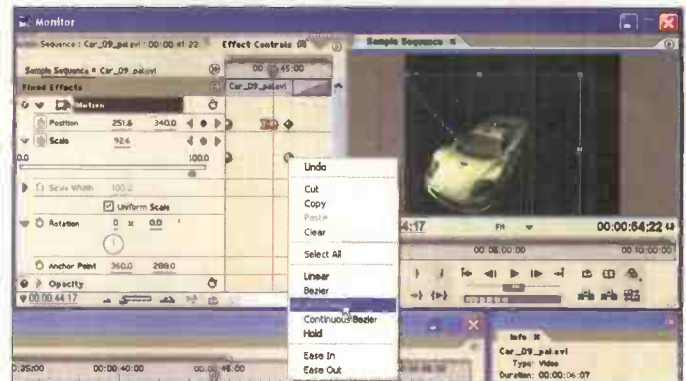
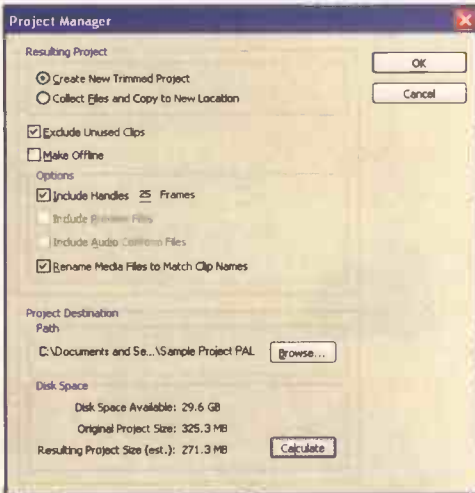
And the working partnership goes even further. From within Premiere, for example, it's possible to select 'New Photoshop File' from the file menu, at which point a new

image with the correct resolution for the current video project will open in Photoshop. And with Photoshop CS' new support for non-square pixels, getting aspect ratios right and creating anamorphic still images are no longer a headache. Similarly, the clipboard now works between applications, so it's possible to copy something in Premiere and paste it into After Effects and vice versa.

Admittedly, it can be argued that these particular innovations will only be of any use to those wishing to run other programs from the Adobe stable. Some critics may, quite understandably, sneer at the assumption that video editors will buy into the idea of

running a suite made up of exclusively Adobe applications. But the truth is that both Photoshop and After Effects remain virtually unchallenged in their respective fields, so the notion of cultivating a

Premiere helps with file management to keep project sizes down



Premiere now includes some Photoshop-style features

close, harmonious relationship between the three programs goes well beyond a cynical marketing ploy for brand loyalty.

Never before has the combination of these programs looked stronger, and those serious about digital video may want to consider the Adobe Video Collection 2.5 Professional Edition (£1,335 inc VAT), which contains not only Premiere Pro, Photoshop and After Effects, but also throws in a decent audio editor, Audition (the program previously known as Cool Edit Pro), and a solid disc authoring package, Encore DVD.

Of course, hop-scotching between big powerful programs such as these requires a pretty athletic system. In fact, many of the benefits mentioned here will not be felt by users who run Premiere on systems at the lower end of the requirement spectrum.

To unlock Premiere's true potential as a non-linear editing studio, the application needs to be run on as fast a machine as possible – that means a Hyper-threading processor or two, gigabytes rather than megabytes of memory, and fast, gargantuan hard disks. For many upgraders, this will likely mean buying a whole new PC into the bargain, which detracts somewhat from Premiere's otherwise fairly reasonable price. Serious pros might want to think about getting further assistance from a hardware-based solution, such as the Matrox RT.X100 Extreme, which includes Premiere Pro (along with Audition and Encore DVD) as well as a range of realtime effects, features and analogue capture at the low price of around £780.

There's no denying that the

progression to Premiere Pro 1.5 is less of an earth-moving event than last year's gear shift from version 6.5 to Premiere Pro and, as such, it's a pity that Adobe couldn't offer this update to existing Premiere Pro users for free (although there is a substantially reduced upgrade price – £81 from the Adobe Store – for those who are already running version 1).

Nevertheless, the enhancements that Adobe has implemented all make for a significantly improved editing experience, particularly for high-end users who intend to use it in tandem with After Effects and Photoshop. For several years Final Cut Pro users have looked down their noses at Premiere, but Adobe's Windows-only editor is doing a good job of clawing back its credibility.

Jonathan Parkyn

DETAILS

RRP £616.88 (£525 ex VAT)

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www.pcw.co.uk/bestprices

PRODUCT INFORMATION Adobe

020 8606 1100 www.adobe.co.uk

SYSTEM REQUIREMENTS

Windows XP • Pentium III 800MHz processor • 256MB of Ram • 800MB of hard disk space • CD-Rom drive • Firewire/video capture device • CD-RW/recordable DVD drive

PROS Powerful professional-grade editing; works well with After Effects and Photoshop

CONS Hefty system demands; not a huge leap from version 1

VERDICT

New functions help make this a strong contender on Windows PCs, but version 1 users should consider whether the additional features justify the cost

EASE OF USE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★

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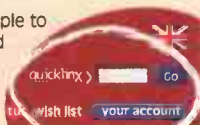
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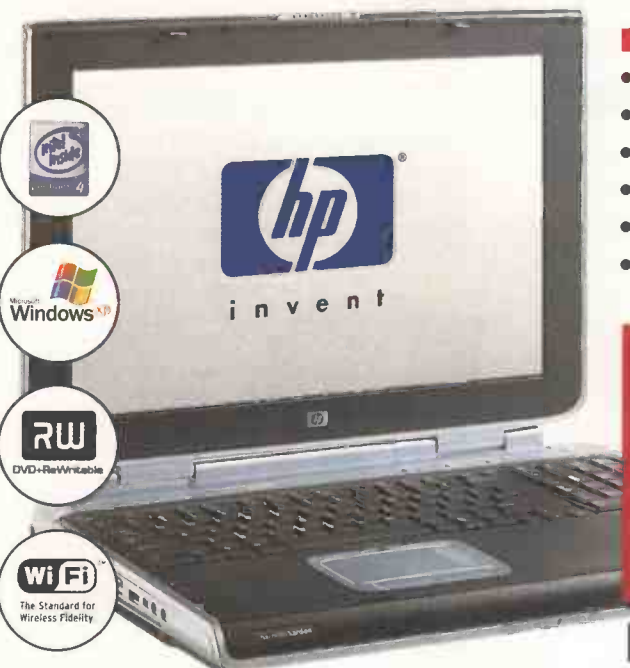
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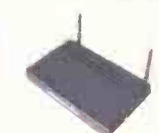


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STUDENT PC

Evesham Axis 30AS

REVIEW September 2004, p115 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



With an Athlon 64 3000+ and 512MB of Ram, this Evesham isn't short of raw power. It also comes with a Canon Smartbase MP360 multifunction device, making it the perfect PC for students.

MID-RANGE PC

Demonite Graduate 64

REVIEW September 2004, p114 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

Demonite 0871 222 7222 www.demonite.com



Demonite has overclocked an Athlon 64 3000+ processor to 2.3GHz and supplied it with 512MB of Ram. With a DVD rewriter and a decent NEC 17in monitor, it's a quality mid-range PC.

HIGH-END PC

Evesham Axis 64 38 Ultra

REVIEW September 2004, p46 RRP £1,878.83

(£1,599 ex VAT) **PRODUCT INFORMATION**

Evesham 0870 160 9500 www.evesham.com



Using the latest Athlon 3800+ processor from AMD, an up-to-the-minute graphics card from Nvidia and Sony's latest dual-layer DVD burner, for good measure, this PC is incredibly powerful.

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.

MID-RANGE NOTEBOOK

Sony VGNA115B

REVIEW September 2004, p47 RRP £1,299

(£1,105.53 ex VAT) **PRODUCT INFORMATION**

Sony 08705 424 424 www.sony.co.uk



With a stylish Sony design, the VGNA115B features an impressive 15in display, 1.5GHz Pentium 4 M processor with 512MB of Ram, and a Radeon 9200 that allows it to run a few games.

BUDGET NOTEBOOK

NEC Versa M500

REVIEW July 2004, p120 RRP £799

(£680 ex VAT) **PRODUCT INFORMATION**

NEC 0870 010 6329 www.nec.co.uk



If you're not bothered about playing games, but want to be able to make use of wireless technology and stray from the mains for over three hours, the NEC Versa M500 is well worth a look.

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 FLAT-PANEL MONITOR

Philips 170B4BB

REVIEW December 2003, p135 RRP £374

(£318.30 ex VAT) **PRODUCT INFORMATION**

Philips 020 8781 8372 www.consumer.philips.com



Giving excellent results with the Windows default colour profiles, the Philips 170B4BB flat-panel monitor automatically detects whether it is connected to an analogue or digital input.

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

Philips HDD060

REVIEW May 2004, p48 RRP £169

(£143.83 ex VAT) **PRODUCT INFORMATION**

Philips 0870 900 9070 www.philips.co.uk



Stylish and small, this mp3 player has a 1.5GB hard disk and can keep going for 10 hours. The only drawback is that you have to use the Philips Java utility to transfer music to it.

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 461 141 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 H4150

REVIEW September 2004, p102 RRP £275

(£235 ex VAT) **PRODUCT INFORMATION**

HP 0845 270 4222 www.hp.co.uk



The Ipaq H4150 from HP is not only an attractive device, but it's also got bags of processor power. What's more, the price tag is lower than we expected, making it a great all-round Pocket PC.

LASER PRINTER

Oki B4300N

REVIEW February 2004, p124 RRP £349

(£297.02 ex VAT) **PRODUCT INFORMATION**

Oki 01753 819 819 www.oki.co.uk



Bursting with features while being able to cruise along at an impressive speed, the very reasonably priced B4300N from Oki can produce some excellent quality printouts.

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.

PENTIUM 4 MOTHERBOARD

Chaintech Zenith 9CJS

REVIEW June 2004, p107 RRP £139.96

(£119.13 ex VAT) **PRODUCT INFORMATION** Holly

Computers 01375 397 220 www.hollycomputers.co.uk



This Prescott-ready board has a dual Lan feature that allows it to function as a network router with Lan support. Despite the high price, it's great value for money and comes with remote control.

MULTIFUNCTION DEVICE

Lexmark X5150

REVIEW October 2003, p122 RRP £149

(£126.81 ex VAT) **PRODUCT INFORMATION**

Lexmark 0870 444 0044 www.lexmark.co.uk



Good software and easy setup make this a very attractive device. Photo quality is excellent with no graininess. Print speeds are a little slow but a good control panel makes up for this.

INKJET PRINTER

Canon Bubblejet i990

REVIEW August 2004, p118 RRP £299

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Creative <http://europe.creative.com>



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REVIEW August 2004, p66 RRP £296

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www.panasonic.co.uk



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REVIEW January 2004, p144 RRP £399

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Kodak 0870 243 0270 www.kodak.co.uk



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Roxio www.roxio.co.uk



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www.microsoft.com



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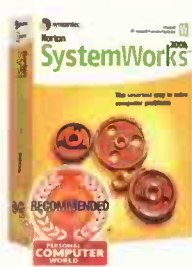
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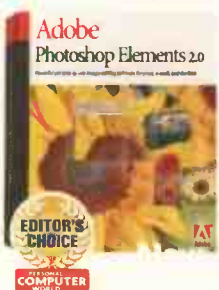
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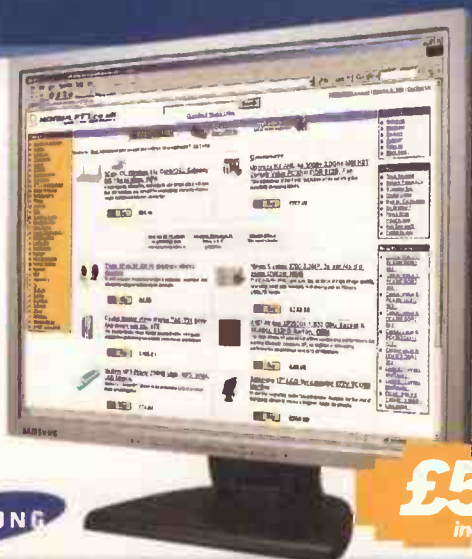
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WORDS: DAVID LUDLOW

The evolution of graphics

Today's graphics cards are constantly being updated and house a wealth of features which can be confusing. We take a closer look at what you can expect

If you've ever opened up your graphics card's driver and looked through the settings, you'd be forgiven for being confused. Anisotropic filtering and full-scene anti-aliasing (FSAA) might be terms that gamers are familiar with, but their names give little away.

Of course, it doesn't help that new features are being added by ATI and Nvidia all of the time. With graphics cards increasing in performance every six months it can be difficult to keep up.

However, these settings shouldn't be ignored as they are important – changing them can drastically alter the image quality and speed of games on your PC.

In this feature we aim to demystify how graphics cards work. The next four pages will visually show what each setting does and it will give you a good grounding so that you can make games look as stunning as possible.

However, the story doesn't end there. Turning all the settings to maximum will give you a great looking game, but it's likely to be jerky. The number of frames per second (fps) you get out of a game is equally, if not more, important. Typically a frame rate of 30fps (5fps faster than TV) is smooth enough to play.

We've also included some of the new features that ATI's and Nvidia's latest graphics cards can deliver. We've magnified areas of the screenshots to make it easier to see what each setting does, but often the on-screen results can be more subtle.

Finally, we've included an in-depth look at the technical aspects of the next generation of graphics card interface – PCI Express – which are now hitting the shelves. With faster transfer rates than AGP and bidirectional data, this new technology has the power to radically enhance games.





RESOLUTION



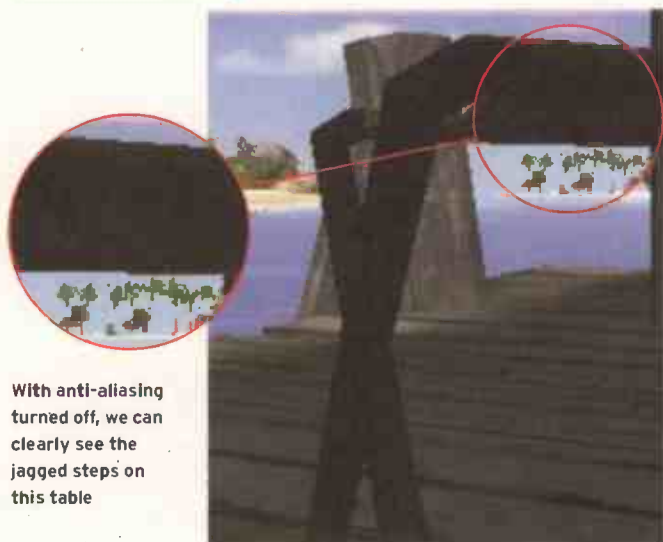
At 800 x 600 the tree loses some detail (right), especially when we zoom in close

At 1,600 x 1,200 (left), the game has more pixels to play with. As you can see, the tree has more detailed leaves

The resolution of a 3D game is as important as on a 2D desktop. Running a game at a higher resolution gives better quality. Simply put, higher resolutions mean more pixels, which means more detail and less blocky images. Our screenshots show Far Cry running at 800

x 600 and 1,600 x 1,200. As you can see, the higher resolution screenshot (above left) shows more detail on the plants. However, the higher the resolution, the more memory each frame takes up. Each frame also requires more processing, which can slow down a game.

ANTI-ALIASING



With anti-aliasing turned off, we can clearly see the jagged steps on this table



Turning on anti-aliasing produces smoother edges and a more realistic finish

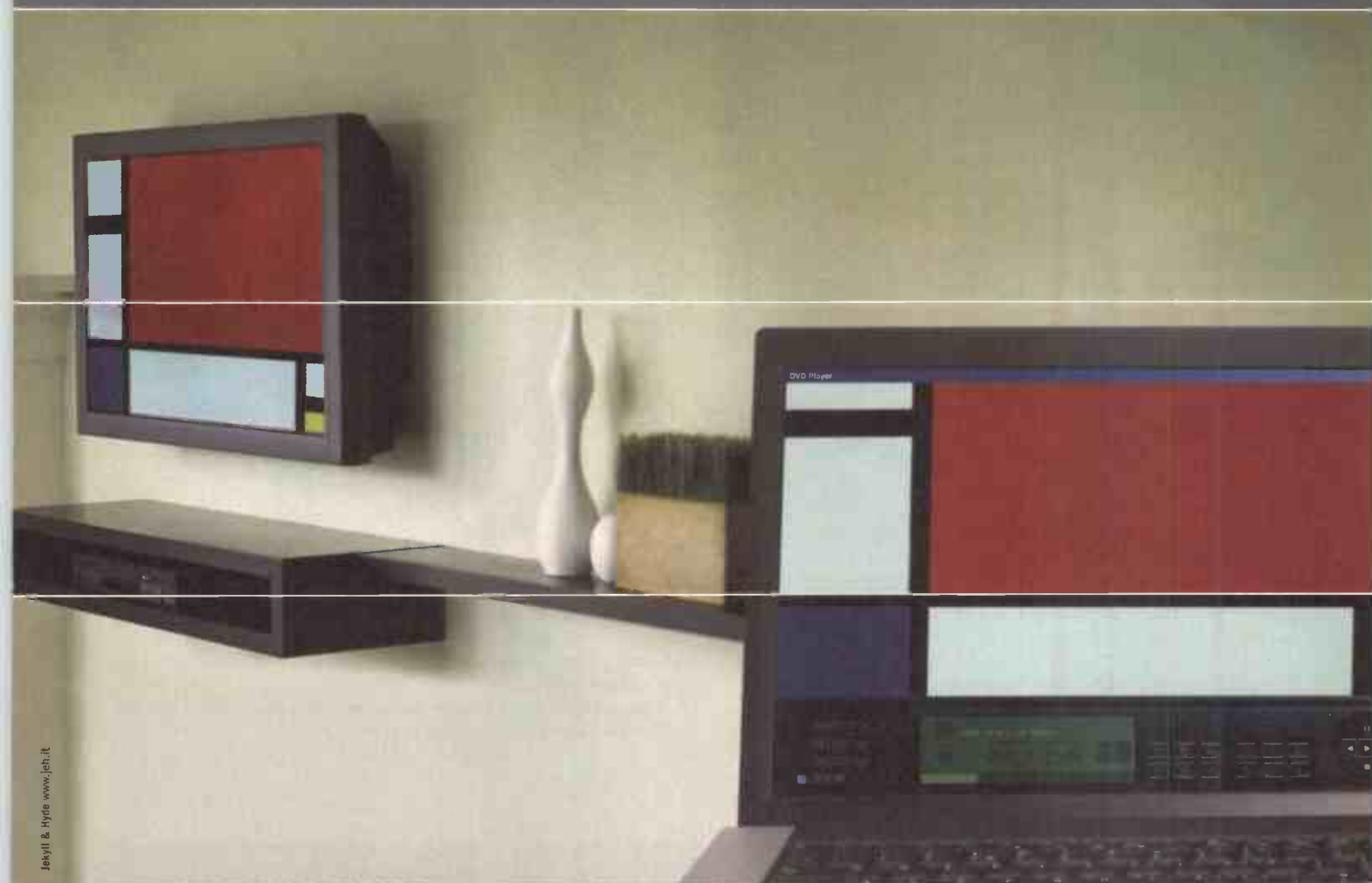
Images on screen are created using square pixels, like colouring in squares on graph paper. While this is fine for vertical and horizontal edges, things at an angle have a jagged appearance, known as jaggies.

To overcome this problem, graphics cards support full-scene anti-aliasing (FSAA) to reduce the problem. Anti-aliasing works by analysing these jagged edges and surrounding them with intermediate shades of colour to smooth the result.

You can turn on FSAA in your graphics card driver. There are different choices, including 2x, 4x and 8x, depending on the model of your card. The exact method used by each graphics card vendor differs, but generally speaking 2x FSAA removes most jaggies, 4x removes almost all, with further improvements up the scale. Each step requires more processing power and slows games down.

Our picture demonstrates the difference between no FSAA and 4x FSAA using Far Cry.





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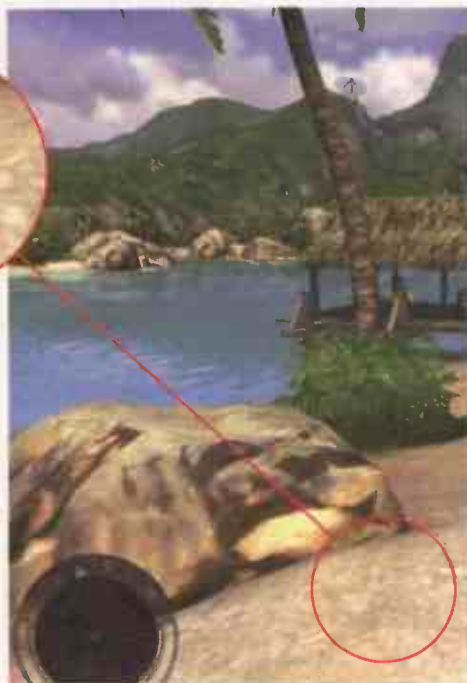
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TEXTURE QUALITY



Lower-quality textures are more noticeable close up, as we can see from the smooth-looking sand



To make solid 3D models look like their real-world equivalents, games use textures, which are wrapped around objects. Textures are image files that look, for example, like a brick wall.

Most games give the option to change the quality of these textures. Higher-quality textures have a higher resolution and look more realistic. Lower-quality textures have a lower resolution and can look blurry. It's easier to tell the difference



High-quality textures have a more realistic look. In this shot we can see that the sand has more definition and even appears to have ripples in it



at close range, where more detail is shown. Objects in the distance don't look that different. Higher-quality textures take up more memory and require more processing to display. Lower-quality textures might not look as good, but they need less memory and are far easier to process.

Our screenshots above show the difference between high-quality and low-quality textures in Far Cry.

FILTERING



As mentioned above, games use textures, which give 3D models a realistic look. Close to the camera the textures are high quality and look very good. However, objects further away have fewer pixels available as they narrow towards the vanishing point.

The result of a lower pixel count and the distortion can create a noticeable blurring effect. This is where filtering comes in. Bilinear and trilinear filtering enhance these textures and reduce the blurring

effect. The filtering is linear and works on the straight edges of each texture.

A better method is anisotropic, which takes into account the distortion caused by mapping textures onto 3D objects. This also has different levels (2x, 4x, and so on), with higher numbers producing better results but adding to the processing overhead. Our screenshots show bilinear (left), trilinear (centre) and 4x anisotropic filtering (right).





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BUMP MAPPING

Without bump mapping the water has a very flat, mirror-like appearance to it. It doesn't appear to move or react like a real pool



With bump mapping turned on the water looks a lot better. Ripples appear and the water reacts a lot more like a real pool would

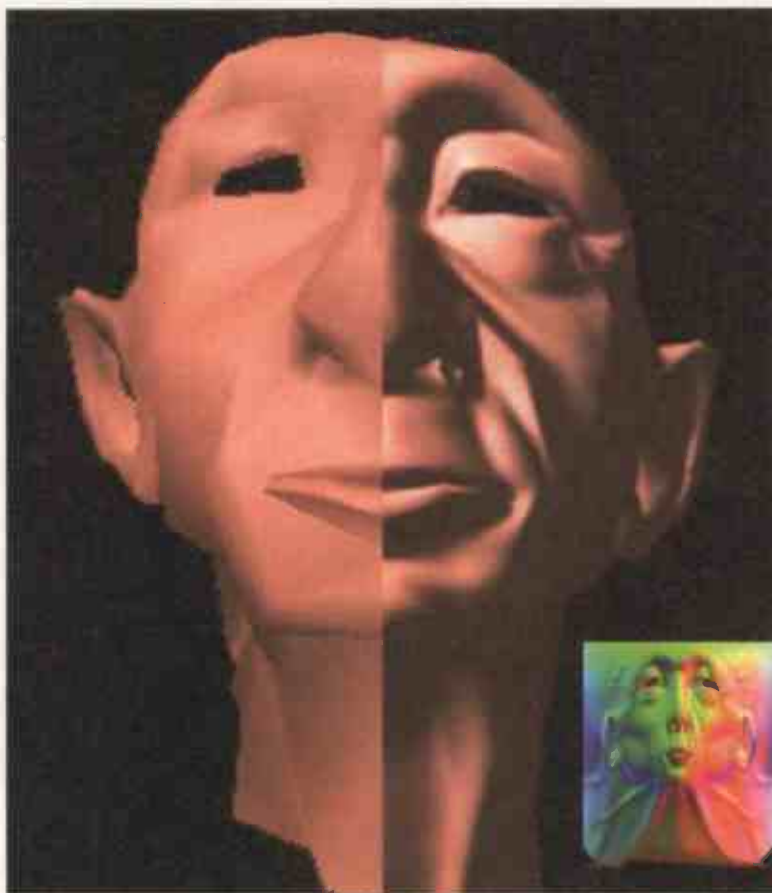
For some objects, such as water and golf balls, modelling each and every dimple is time consuming and difficult to do. An easier method is to use bump mapping.

Bump mapping uses lighting effects to give the illusion of small 3D indentations and outcrops.

It is a technique commonly used by games developers and you don't usually have any control over whether to use it

or not. However, it's interesting to see the differences. The screenshot above shows the Nvidia Tide Pool demo. The left-hand side has bump mapping turned off, while the right has it turned on.

As you can see the water looks a lot more realistic on the right-hand side, compared to the flat rendering on the left part of the screenshot.



NORMAL MAPS

While bump mapping generally looks good, it can produce results that look quite flat when viewed up close. A better technique is to use normal maps for higher-detail objects.

It's a technique that can make a model that only uses a small number of polygons look like it uses many more.

Normal maps are special textures that describe which way each pixel is facing. When used with a lighting model it creates more realistic 3D surfaces. Once applied to a model it increases the detail level.

Normal maps are used to cover a model in much the same way a texture is used. However, the normal map is applied first to give the correct lighting. Once done, the normal texture is applied to complete the process.

The technique is not without its problems though. Normal maps take up a lot of memory on the graphics card. Even with 256MB of onboard memory, games developers are limited to the number of normal maps they can use. This can make them difficult to use in games.

Typically designers get around the problem by only using normal maps on main ('hero') characters, which will be shown more frequently.

Our screenshot shows how normal maps are used. The left-hand side shows a low polygon model in its native form. The right-hand side shows the same model after a normal map has been applied. As you can see, it looks like a much higher polygon model.

Finally, the image at the bottom right is the normal map, which is applied to the model. It's this texture that tells the computer how it should be lit.



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ATI 3Dc

With standard normal maps we can get a more detailed model using a lower polygon count



Using ATI's 3Dc compression lets developers use high-resolution normal maps. As you can see, it results in a more detailed model

As we mentioned on the previous page, while normal maps mean you can use lower polygon models, they take up a lot of memory, which limits the number and quality of when they are used. ATI has developed its 3D compression (3Dc) technology to combat this.

It compresses the normal map, meaning that higher-quality maps, which take up less memory, can be used. DirectX also has compression technology, but it's not very good and can distort the image quality.

ATI's technology vastly improves the image quality. However, 3Dc is currently only available on new ATI cards, such as the X800. It also requires games to be written specifically for it. Our screenshots from Serious Sam 2 show the technology in action.

The figure on the left uses standard normal maps and looks very detailed. However, the figure on the right uses a high-quality 3Dc normal map. As you can see, the detail on the skin is considerably greater, giving a more realistic result.

SHADER MODEL

With Shader Model 1.1 the steps are flat and only have a basic texture to give the impression of stone



Shader Model 3 lets game developers create more realistic scenes. The steps in this shot look a lot more like weathered stone

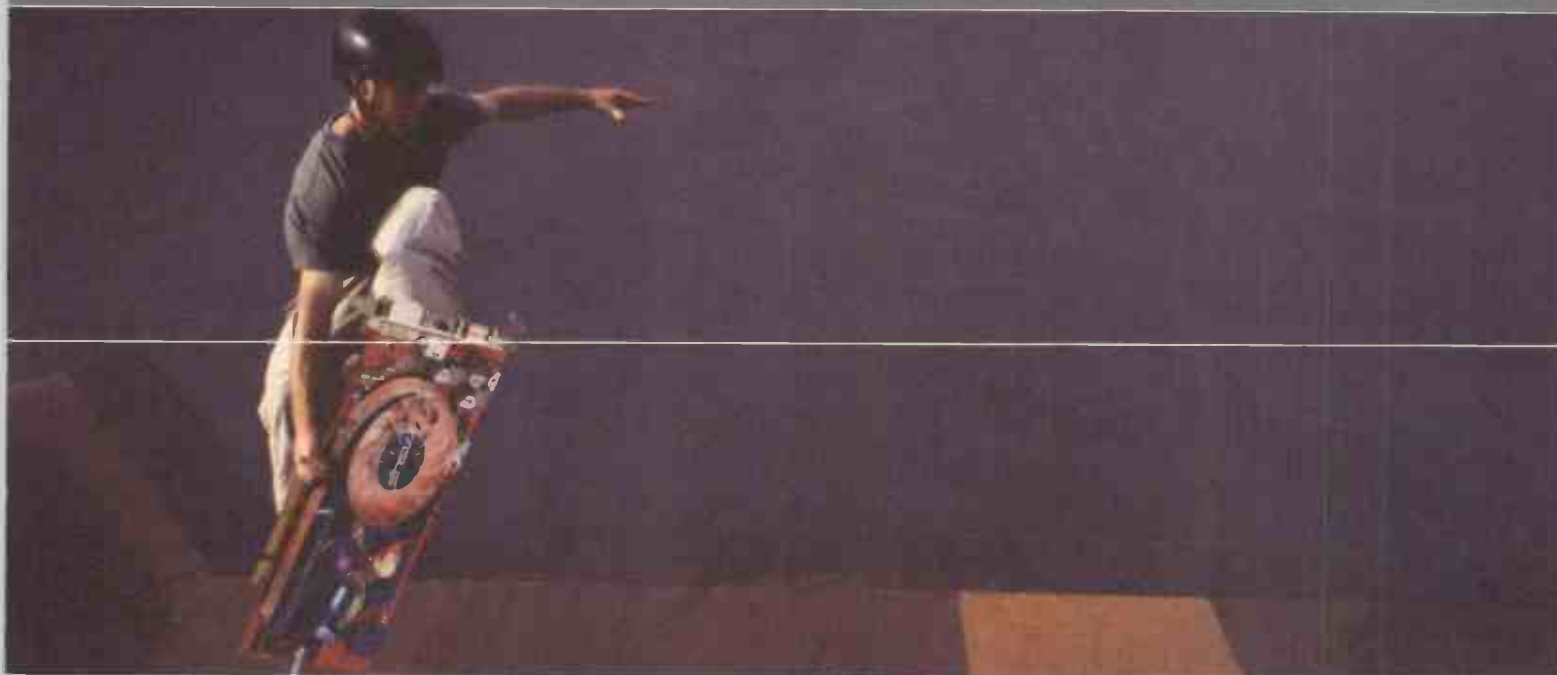
All games use the shader model inside DirectX. It lets developers write routines that, for example, generate the lighting effects in games. As DirectX has progressed, so has the quality of the shader model.

Nvidia is the first company so far to support shader model 3 (SM3). A patch is due out for Far Cry that will support this latest version.

The new model allows for realistic images, such as displacement mapping, which solves the problem of some 3D models looking flat when viewed close up.

Our screenshots show a comparison between SM1.1 and SM3. As you can see, the image on the right has a lot more detail around the area on the steps and looks a lot more natural than the image on the left.





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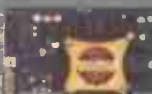


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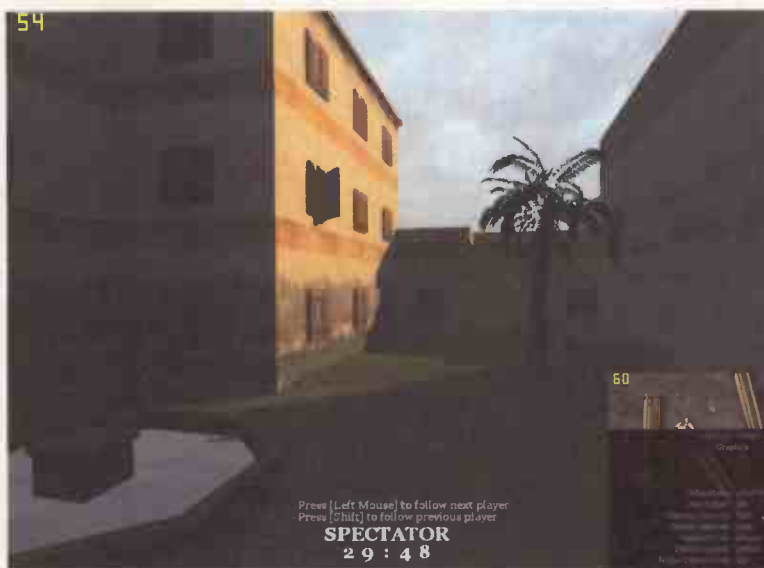


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Optimising for games

A lot of the features that we've talked about over the previous five pages can be fine-tuned in the graphics card's driver settings or inside the game. It can be difficult to know which settings to play with to get a decent frame rate. Here, we'll talk you through configuring your games to get the best experience out of them.

The place to start is inside the graphics card driver. Right-click on the desktop and select Properties, double-click your primary display and click on the Monitor tab. Ensure you've got a decent refresh rate selected (60Hz or above). Monitors are progressive scan devices and update the entire screen once per Hz. If your driver is set to synchronise with the monitor's refresh rate – a driver setting known as Vertical Sync or Vsync – then the game's frames per second (fps) will not exceed the refresh rate. This is to reduce the annoying 'tearing' effect that occurs if the frame rate doesn't match the refresh rate, so set your refresh rate as high as possible. Vsync should only be disabled if you're trying to run benchmark programs.

You can use Fraps (www.fraps.com) to test the frame rate of a game. Around 30fps is smooth, and anything above is better. Don't get too bogged down trying to get higher and higher rates, as beyond 60fps you really won't notice the difference. Higher frame rates just mean that your PC isn't struggling to run that particular game and has plenty of power left for more complex scenes.

The advice below is quite generic, as the pay-off between performance and quality is a very individual choice. Also consider that a higher spec PC with the latest graphics card will cope much better than an older machine. Playing with the settings and getting used to how they work is the best advice, and it's really trial and error. Remember, some games have an autodetect setting, which will fine-tune the game based on the specification of your PC.

Drivers

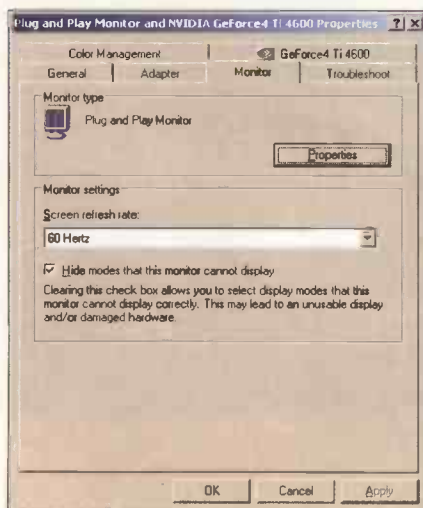
The Internet is awash with discussions about graphics card drivers and whether later versions have been modified to produce faster frame rates by sacrificing



Top left: Fraps displays a frame counter for all games

Above: Most games let you change the detail settings

The display properties are an important part of optimisation



quality. We're not going to enter the debate here, as there's not enough space. However, as a general rule of thumb, it's worth updating your drivers once every couple of months to get the best release. Drivers can have a huge impact on games performance.

Resolution

Resolution is an important factor in any game and it's a matter of balancing the resolution against turning on quality settings, such as anti-aliasing. The first port of call is to run a game at 1,024 x 768 with no features turned on. Check Fraps and see what the frame rate is. If it's hovering around the 30fps mark, then drop the resolution to 800 x 600 to get a boost.

If it's running at around 80fps then it's good enough to turn on some advanced features. If it's in excess of this and your monitor supports higher resolutions then try turning up the resolution.

Advanced settings

Assuming we now have the resolution sorted and your game is running at around 70 or 80fps, it's time to play

around with the more advanced settings found in the graphics card driver. The most important ones are the filtering settings and full-scene anti-aliasing (FSAA).

Trilinear filtering and 2x FSAA will give you a good-looking game. Try these settings and run your game again. If the frame rate drops below 30fps, then you should try dropping the resolution down one setting. If it's still jerky, then you should turn off anti-aliasing.

If the settings still don't knock down the frame rate too much, then move up to 2x anisotropic filtering and 4x anti-aliasing. The rule here is to slowly notch up settings until the game becomes unplayable. However, that said, 4x anisotropic and 4x FSAA is all you're likely to need for a great-looking game.

Quality settings

Inside the game you can usually find quality settings, such as texture quality. If your game is running well then you can try turning up some of the quality settings and seeing how they impact the game. It's difficult to give advice here, as settings vary between games.

Old v new games

You'll probably find you'll have to change settings based on the game you're playing. Older games are written for lower spec PCs and, therefore, you should be able to run them at higher detail settings.

Newer games are written to take advantage of the latest hardware and have more complex artificial intelligence. You'll probably find that you have to turn down detail settings to get them working smoothly.

PCI Express

PCI Express is banishing the AGP graphics port and PCI slots from the motherboard. With graphics cards in particular, there won't be any choice: the imminent Intel motherboards using the Intel 915 and 925X chipsets won't have an AGP slot. Without a matching PCI Express graphics card, you can forget colourful 3D worlds.

The situation for other expansion cards, including network and sound cards, is a little less urgent. Rather like the position during the transition from ISA to PCI, new motherboards (at least for the next couple of years)





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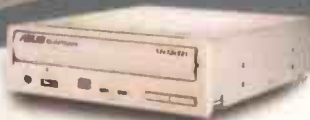
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will have both the new PCI Express slots and conventional PCI slots.

PCI Express' advantage lies in the transition from parallel to serial connection technology. This supports higher data rates, simpler and cheaper circuit board layout and is more reliable. The PCI Express interface's performance is scalable: PCI Express 1x, 2x, 4x and 16x are defined in the standard. The factors show the number of PCI Express links that are used to build up the interface's scalable bandwidth (see figure 1).

You can recognise the PCI Express types by the different lengths of the motherboard connectors.

The simplest version, PCI Express 1x, can achieve data rates of 0.23Gbytes/sec – double the rate of PCI, and quite adequate for most expansion cards. PCI Express 16x makes bandwidths of up to 3.7Gbytes/sec possible.

Video's the only winner

The coming 3D cards won't work faster just because of the PCI Express interface. The switch from AGP 4x to AGP 8x achieved only slight improvements in speed.

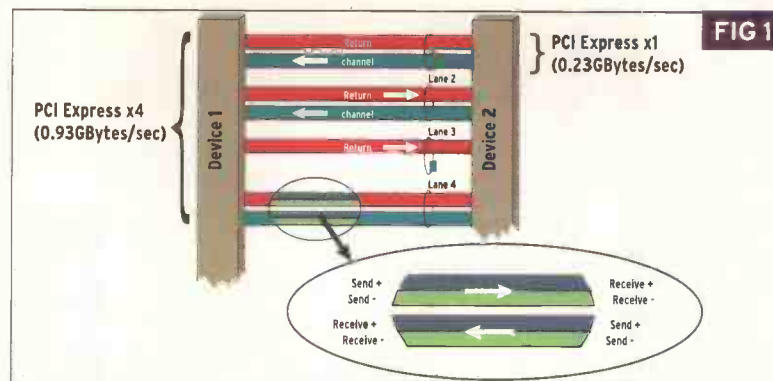
Up-to-date graphics cards have ample local memory of up to 256MB – and, even when making use of extensive texture and geometric data, they only seldom have to transfer data across the graphic bus to system memory. This means that the bus bandwidth is relatively unimportant.

PCI Express shows its strength if you're using the card for video editing. In this case, data flows not only from the system to the graphics card but also back. For example, in a TV card the graphics chip first converts the TV signal to an mpeg stream and then sends it to be stored on the hard disk. AGP graphics cards are at a disadvantage here: the AGP bus is one-way and optimised for unidirectional data transfer: up to 2Gbytes/sec can be moved from the system to the graphics card, but in the other direction it's limited to 266Mbytes/sec. The data is transferred alternately in one direction at a time.

With PCI Express 16x, on the other hand, the full 3.7Gbytes/sec is available for data in both directions at the same time. The graphics card can read a video signal and simultaneously be used for a 3D game without loss of performance. Bandwidth is particularly important in the context of high-resolution video: HDTV, for example, requires up to 250Mbytes/sec to transfer a single video stream at a resolution of 1,920 x 1,080 pixels, far too much for AGP's upstream rate.

The first cards

Graphics chip manufacturer Nvidia has decided to make the transition to PCI Express simple. Initially the new cards will use existing chips, but with a supplementary



bridge chip as a translator between the graphic chip's AGP interface and the card's PCI Express interface. To keep up with PCI Express' higher bandwidth, the AGP connection runs at twice the frequency, equivalent to 16x AGP.

Nvidia is making PCI Express versions of all its cards available. The 3D architecture and performance characteristics remain unchanged. For example, the GeForce FX-5950 AGP card will be available in a PCI Express version as the GeForce PCX 5950 (see the PCI Express Graphics chips table below). The GeForce PCX 5750- and 5300 models will, apart from a slight difference in frequency, hardly differ from the FX 5700 and 5200 AGP cards. We've got reviews of a PCI Express motherboard and an Nvidia GeForce FX 5750 in our reviews section on page 64.

With an eye on the future, it's worth noting that the bridge chip, designated high-speed interconnect (HSI) also works the other way, translating from PCI Express to AGP. If Nvidia changes over completely to PCI Express technology in the second half of the year, you'll still be able to use AGP cards with HSI for upgrades.

ATI decided early on to go for chips with a pure PCI Express interface. Its new chips were ready as motherboards such as the R423, the PCI Express version of the top-of-the-range Radeon X800, were introduced.

Trial and error

We've tried to cover the major bases with this quick guide, but there are a lot of factors in play with games. The only thing that you can really do is play with the settings and see when the game becomes unplayable.

If it gets jerky, you probably have your PC set too high. It's a trial and error process, but the more you change the settings the easier it is to configure. Send your comments to the PCW mailbox (letters@pcw.co.uk) and, if there are enough requests, we can look into bringing you a more detailed feature on optimising graphics for performance. ■

The table below shows a list of the current and proposed PCI Express chips from ATI and Nvidia. The main difference is Nvidia's initial use of a bridged solution as opposed to ATI's native implementation

PCI EXPRESS GRAPHICS CHIPS

CHIP	CODE NAME	GRAPHICS INTERFACE	MEMORY INTERFACE	VERTEX SHADERS/ RENDERING UNITS	DIRECTX SUPPORT	TYPICAL PRICE
ATI Radeon X880	R423	PCI Express	256bit	6/12 to 16	DirectX 9.0	>£350
ATI Radeon X600	RV380	PCI Express	128bit	2/4	DirectX 9.0	£120
ATI Radeon X300	RV370	PCI Express	64/128bit	2/4	DirectX 9.0	£65
Nvidia GeForce PCX 6xxx	NV45	PCI Express	256bit	6/12 to 16	DirectX 9.0c	>£350
Nvidia GeForce PCX 6800	NV40 HIS	AGP16x*	256bit	6/12 to 16	DirectX 9.0c	>£350
Nvidia GeForce PCX 5950	NV38HSI	AGP16x*	256bit	3/8	DirectX 9.0	£300
Nvidia GeForce PCX 5750	NV39HSI	AGP16x*	128bit	2/4	DirectX 9.0	£120
Nvidia GeForce PCX 5300	NV37HSI	AGP16x*	64/128bit	1/4	DirectX 9.0	£80
Nvidia GeForce PCX 4300	NV19HSI	AGP16x*	64/128bit	None/2	DirectX 7.0	<£70

* Bridge chip needed with PCI Express graphics cards. Preliminary specifications subject to change

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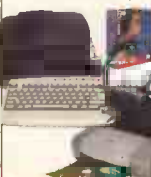
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PDAs have come a long way since they were first introduced, and today's models now offer a wide array of features. We review 12 of the latest pocket marvels

Handheld helpers

WORDS & TESTING: NIALl MAGENNIS PHOTOS: BRUCE MACKIE

PDAs may have started life as electronic replacements for yuppie Filofaxes, but over the years they have evolved into very powerful machines.

Screens have improved from grainy black and white LCDs to amazingly sharp TFT models that can display thousands of colours. Even processor speeds have jumped from 8MHz chips to screamers running at 400MHz, capable of playing mp3 and movie files.

The latest machines offer great wireless connectivity too. Many support wireless networks, so you can sit in hot spots and surf the net at broadband speeds. And when you're on the move, you can use infra-red or Bluetooth to keep your PDA connected via your mobile phone.

But like mobile phones, PDAs are personal items. Because we tend to carry them with us wherever we go and use them to store personal information on family and friends, we treat them as more than mere machines. Therefore it's key to make the right choice when you're shopping for a handheld. That's why we've tested all the latest machines across a broad spectrum of price points to find the top options that offer the best value for money.

So, whether you're looking for a fun PDA with a built-in camera to take snaps of your mates, or a serious handheld that features biometric security to keep your contacts safe, our comprehensive guide will help you choose the perfect electronic companion.





Fujitsu Siemens Pocket Loox 420

Fujitsu Siemens has been plugging away at the Pocket PC market for quite some time, but its products have always appeared workmanlike when pitched against rivals. Part of the problem has been design – its previous PDAs just haven't looked sexy enough.

But things are changing if the 420 is anything to go by. In a world full of silver handhelds, the 420 stands out with its dark grey colour scheme and angular buttons, and it's surprisingly thin and light. The screen is also of a very high standard, as it's crisp and bright with vivid colours.

There's 64MB of memory onboard, but no Flash memory available for backup, which limits it a bit. However, you can use an extra application called FSC backup to send data to an Secure Digital (SD) card for archival purposes.

There's also no Compact Flash (CF) slot provided, but at least the Pocket Loox has all the wireless bases covered with both Bluetooth and Wifi built in as standard, so perhaps you won't need to expand the machine. Battery life was generally good, but it does suffer when making use of its wireless technology.

The Loox 420 represents a big step forward for Fujitsu Siemens, but there are still weaknesses, such as the lack of Flash memory, which let it down.

DETAILS

RRP £265 (£218 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Fujitsu Siemens 0800 004 003

www.pocketloox.co.uk

PROS Attractive styling; Bluetooth and Wifi

CONS No Flash memory

VERDICT A good-looking handheld let down by a few niggles

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



Fujitsu Siemens Pocket Loox 610

The Pocket Loox 610 hasn't so much been touched with the ugly stick as been whacked by it. This PDA is one of the largest Pocket PCs on the market and is not very comfortable to hold.

The styling is also of the same level you'd expect from a cheap Far Eastern import rather than a top-tier manufacturer and, despite the bulk, the company hasn't managed to integrate the aerial into the case, so you get a stub at the top that snags in your pocket.

But at least the PDA boasts both Wifi and Bluetooth as standard and has a nippy 400MHz processor. There's also 128MB of Ram, 123MB of which is available to the end user, and an additional 28MB of Flash memory for backing up important data. For expansion, the company has added both an SD and CF card slot to the top of the unit.

The screen seems smaller than it really is because it's dwarfed by the bulk of the PDA, but it's not quite up to the standard of the screens on HP's Ipaqs. The battery life is also relatively short and, when in wireless mode, it struggles even more.

When it first appeared, the 610 was a pretty average PDA that boasted great wireless connectivity but, some months on, it just can't cut it among better looking, and better performing rivals.

DETAILS

RRP £433 (£369 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION Fujitsu Siemens

0800 004 003 www.pocketloox.co.uk

PROS Good wireless support

CONS Poor battery life; ugly design

VERDICT Despite great wireless support, the Pocket Loox can't cut it among better looking and cheaper competitors

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



HP Ipaq H4150

The H4150 is one of the slimmest and smallest handhelds on the market, but just because it's small doesn't mean it's lacking in features.

In fact the PDA supports both Bluetooth and Wifi, making it great for surfing the web or picking up email on the move. The built-in Ipaq wireless application for controlling both of these modes is also one of the easiest to use on any Pocket PC.

Naturally, due to its slim design there isn't any room for a CF card slot, but you do get an SD slot which is compatible with the SDIO standard for small form factor expansion cards.

The screen on the H4150 is a touch smaller than those on some of the other Ipaq models around, but it virtually fills the whole of the front fascia so it doesn't feel like you're losing out. It's also very readable and has vivid colour reproduction, which makes it great for viewing movies.

The machine is powered by a 400MHz processor so it's no slouch, but memory is a touch tight with only 55MB of the 64MB of total Ram available. There's also only 2.8MB of Flash memory available for backing up.

Nevertheless, the H4150 remains a great PDA. It's small and light, has bags of power and looks great. It's even got a sensible price tag. If proof were needed that good things come in small packages, then this is it.

DETAILS

RRP £276 (£235 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

HP 0845 270 4222 www.hp.com/uk

PROS Wireless support; small, slim and light

CONS Memory is a touch tight

VERDICT The H4150 has a lot going for it. Sensible price tag, great design and small form factor make it a real winner

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



HP Ipaq H5550

The H5550 is hefty, in terms of both bulk and price. It's one of the larger Pocket PCs around and, costing just shy of £500, is certainly not wallet friendly. HP really needs to have kitted it out with lots of goodies for it to be taken seriously.

Luckily, the company has done just that. If you're after a PDA for business use then the chances are that the H5550 can tick the box for every feature on your shopping list. All the wireless bases are covered, with both Bluetooth and Wifi supported, and the generous helping of 128MB of Ram means there's lots of room for storing documents, music files or even video clips. There's also 17.4MB of the Flash Rom available for backing up important data.

The real show-stopping feature, however, is the fingerprint reader just below the screen. You can use this to secure sensitive data so it's not accessible should someone make off with your pride and joy. It does take a few tries to get used to it, but the sheer wow factor is sure to impress your mates.

However, despite the serious amount of goodies included, HP hasn't decked out the H5550 with a CF slot. As a result, if you want to expand the PDA, you'll need to invest in SDIO add-ons instead.

Overall, the H5550 is a great PDA for business users, but its price tag and bulky dimensions will put off everyday users.

DETAILS

RRP £492 (£419 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

HP 0845 270 4222 www.hp.com/uk

PROS Features; built-in fingerprint reader

CONS Bulky; pricey

VERDICT The H5550 offers stunning features, but it's expensive for those who can't claim it as a company expense

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



Mitac Mio Digiwalker 168

If you want to stand out from the crowd in the Pocket PC market then you need to offer something a bit different. In the case of the Mio 168, that is a GPS receiver that allows the PDA to act as an in-car navigation system.

But, apart from the addition of the GPS receiver and navigation software, it has to be said that the Mio168 is a pretty average PDA. The case feels quite plasticky, especially when compared to something like the Ipaq H4150, and the latch for the GPS aerial doesn't inspire confidence that it would stand up to vigorous daily use.

The spec of the machine is quite basic too. Only an infra-red port is provided for connecting to the outside world as there's no Bluetooth or Wifi support built in. You also only get a single SD card slot for adding memory, and the processor speed at 300MHz is slower than the usual 400MHz you'd expect to find at the moment. Memory is also quite tight at just 32MB.

As a PDA, it might not be anything special, but as a GPS tool it puts in a great performance. The unit comes with an SD card that is preloaded with UK maps so it's a cinch to set up. The GPS performance was impressive and the maps supplied by Navtech were accurate. It's also very easy to use, with great features such as automatic re-route when you take a wrong turn.

DETAILS

RRP £450 (£383 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION [Lowestonweb](http://Lowestonweb.com)

0870 160 9500 www.lowestonweb.com

PROS Great GPS device; small and light

CONS No Bluetooth or Wifi support; slow processor and small amount of memory

VERDICT Not a great PDA, but if you're after a GPS navigator then it is worth a look

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



Mitac Mio Digiwalker 558

Although you may not be familiar with the Mitac name, the company has considerable experience in designing and manufacturing PDAs for other companies such as NEC. However, it's only recently that it has started making PDAs under its own name for the UK market.

The Mio Digiwalker 558 is its current top-spec machine. It uses a 400MHz Intel Xscale PXA263 processor and has 64MB of Ram, so it's no slouch. There's also around 32MB of Flash memory available for backing up important files.

Mitac has decked out the machine with both CF and SDIO slots, and there's built-in support for Wifi and Bluetooth. The screen is also crisp and sharp and is excellent for photos or graphics.

However, the Mio loses out when it comes to build quality. The case just doesn't feel as sturdy as other models, and the silver finish looks cheap. It's also quite large and isn't as comfortable as some of its more petite rivals.

We also didn't like the way Mitac has provided a 2.5mm headphone jack. It means if you want to use a standard pair of Walkman-style headphones, you'll need to buy a bulky converter jack.

The Mio 558 isn't a bad PDA, but it does look mediocre when seen in the company of such sterling handhelds as HP's H4150.

DETAILS

RRP £440 (£374 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION [Lowestonweb](http://Lowestonweb.com)

0870 160 9500 www.lowestonweb.com

PROS Screen; performance

CONS Expensive; bulky; 2.5mm headphone jack

VERDICT The Mio 558 doesn't excel in any area and looks distinctly average when compared with some of its cheaper rivals

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

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E-VALUE Code: PPUK4 - N0808

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E-VALUE Code: PPUK4 - N080C

Recommended Upgrade Offer

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- Upgrade to 3 Year International On-Site Next Business Day Service² £176 incl. VAT



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- Microsoft® Works 7.0
- 1 year Euro Collect and Return Service

£729

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£915

Incl. Del. & VAT

E-VALUE Code: PPUK4-N0811

Recommended Upgrade Offer

- Microsoft® Windows® XP Professional¹ £59 incl. VAT
- Integrated 4x DVD+RW Drive £59 incl. VAT
- Upgrade to 3 Year International On-Site Next Business Day Service² £234 incl. VAT



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Power

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Excl. Del. & VAT

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Incl. Del. & VAT

E-VALUE Code: PPUK4 - N0804

Recommended Upgrade Offer

- Logitech™ Notebook Web Camera¹ £30 incl. VAT
- 4x DVD+RW Drive £59 incl. VAT
- Upgrade to 3 Year International On-Site Next Business Day Service² £234 incl. VAT



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Performance

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- 40GB Hard Drive
- 15.4" Wide Aspect UltraSharp™ WXGA (1280x800) Screen
- 64MB nVidia® GeForce™ FX5200 Graphics Card
- 8x DVD-ROM/24x CD-Rewriter Combo Drive
- Microsoft® Works 7.0
- 1 year Euro Collect and Return Service

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£938

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E-VALUE Code: PPUK4-N0806

Recommended Upgrade Offer

- Planet 21 Trolley Case¹ £79 incl. VAT
- 60GB Hard Drive £53 incl. VAT
- Upgrade to 3 Year International On-Site Next Business Day Service² £234 incl. VAT



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0870 907 5883



Palmone Tungsten T3

The T3 slots in at the higher end of Palmone's range even though it doesn't offer up goodies such as a megapixel camera or Wifi support. That's not to say it's not an impressive handheld, as there are some innovative touches to help the T3 stand out from the crowd.

The PDA is a development of Palmone's earlier Tungsten handhelds and is slightly taller and slimmer than before. You get a healthy 128MB of Ram for storing documents, pictures and music, and if you need more you can always use the SDIO slot. It feels very quick to use, partly thanks to the 400MHz processor, and Bluetooth is provided for connecting to a mobile phone to pick up email or surf the web.

However, the best thing about the T3 is its screen. Its first party trick is that, when you pull the top and bottom of the PDA apart, an extra part of the screen extends out of the case. The other trick is that at the touch of a button, the 320 x 480 display can be rotated from portrait to landscape mode. The latter is great for working with PC files in the Documents to Go software. The quality of the screen is also exceptional, as it's bright and ultra-easy to read.

In fact, the T3 really is a very impressive PDA. It looks good, has great performance and offers up enough features to satisfy even the most demanding of tech heads.

DETAILS

RRP £269 (£229 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION Palmone

0118 974 2700 www.palmone.com/uk

PROS Screen; performance

CONS No Wifi

VERDICT The T3 offers a good all-round specification. It has a great screen, plenty of features and attractive looks

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



Palmone Zire 31

Lately, Palmone has been going out of its way to help those who are strapped for cash but still want bright features in their budget PDAs.

It wasn't long ago that if you went to a shop and asked for a PDA for just over £100 the shop assistant would have laughed. However, not only does the Zire 31 come in at well under this mark, but it can also play mp3 files and boasts a colour screen.

For this price you wouldn't expect the screen to be particularly stunning, and it does turn out to be very basic. It uses old supertwist nematic (STN) technology and has a meagre resolution of 160 x 160 pixels. It's definitely not one of Palmone's better displays, and it is quite difficult to stare at for long periods.

However, there are other areas where the 31 puts in a good performance. Palmone has placed a standard stereo headphone jack at the top of the player along with an SDIO slot for memory cards and expansion. These, combined with the Real Audio software, mean the unit acts as a decent mp3 player. The 31 also feels pretty nippy thanks to the Intel Cotulla 200MHz processor, and there's 16MB of Ram, 14MB of which is available.

There's no denying the Zire 31 offers great value for money. But we'd advise potential buyers to check out the screen before splashing their cash, as it is quite limited.

DETAILS

RRP £101 (£89 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION Palmone

0118 974 2700 www.palmone.com/uk

PROS Colour screen; mp3 playback;

nippy budget processor

CONS Screen is very basic

VERDICT If you're on a tight budget this is a good option, but the screen is basic

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



Palmone Zire 72

The 72 sits at the top of Palmone's Zire range of handhelds and is decked out with great features, including a brand new processor and a high-resolution camera. It's really a development of the Zire 71 rather than a total redesign, but there's enough new on offer to set it apart from its predecessor.

Palmone has dumped the awkward sliding mechanism used to cover the camera lens on the previous model. The lens on the 72 is now fixed on the rear and slightly inset in the case to protect it from scratches.

The camera technology has also been updated so you get a 1.2megapixel snapper. It's a big improvement, but you wouldn't use it as a replacement for a proper digital camera as it only uses a Cmos sensor, so colours look a bit washed out.

The processor is an Intel PXA270 running at 312MHz. While the megahertz rating might not sound too hot, it's faster than older processors as it is more efficient, especially when dealing with multimedia. It also uses the same Speedstep power-saving technology you'll find in Intel's laptop chips.

Palmone has even improved the screen and added Bluetooth support, but it's a shame there's no Wifi support. Nevertheless, the Zire 72 is a great all-round package. Its powerful yet fun features mean it appeals to a large audience.

DETAILS

RRP £199 (£170 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION Palmone

0118 974 2700 www.palmone.com/uk

PROS Processor; 1.2megapixel camera; battery

CONS No Wifi support; camera not digital quality

VERDICT A great PDA from Palm that's packed with features; we just wish it had Wifi support too

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



Sony Clié PEG-TJ27

Sony recently announced it will no longer create PDAs for any market outside Japan. So it looks like the TJ27 is part of the last line of Clié devices we will see from Sony in Europe. This model is one of the company's budget offerings, but it still manages to boast some interesting features.

For such a low-priced PDA it offers a very good-quality 320 x 320 screen, but the main feature is the onboard camera. It can take 640 x 320 snaps and, while it won't have you chucking your digital camera in the bin, it's a fun addition.

However, the TJ-27 suffers from the same problems that afflict Sony's other PDAs. It has a Memory Stick Pro slot, which is great if you use Sony gear but a nightmare if you don't. A bigger issue, however, is the way Sony adds its own interface touches over the top of the Palm operating system. The result is a lack of continuity with different control combinations used for different tasks.

There are other issues too. Despite the presence of the camera the TJ27 is a bit limp when it comes to multimedia performance. There's no headphone socket and no speaker so you can't use it as an mp3 player.

The TJ27 is a mixed bag. It's got a fun camera and good screen, but the Sony OS extensions are confusing and you can't use it as an mp3 player.

DETAILS

RRP £170 (£144 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Sony 08705 111 999 www.sony.co.uk

PROS Screen; built-in camera

CONS Confusing OS extensions; no speaker or headphone socket

VERDICT A good screen and camera but the lack of audio playback is disappointing

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



Toshiba E400

Whereas Toshiba's E800 offers tons of features at a premium price, the E400 is very much a budget offering. It shares a lot of the styling touches used on its more illustrious sibling, including the cobalt blue case and angular navigation controls, but in terms of size it's a dramatic departure.

In fact, it's one of the slimmest pocket PCs on the market. But what it loses in thickness it gains in height and width. It really is a curious design decision, because the added girth and stature make it feel quite bulky when you're holding it.

Another anomaly is the fact that the PDA only has 16MB of Rom for storing the operating system and applications. Most Pocket PCs have 32MB, and the result is that the E400 lacks the Picture Viewer application you'll find on other Windows machines. However, Toshiba has added a full 32MB of Flash memory that's available to the user.

The 300MHz processor also puts in a decent performance and is backed up by 64MB of memory, which is pretty standard for a budget PDA. The screen is the usual transreflective TFT type, but it's not quite as crisp as those on competing models.

And therein lies the problem. It's just a pretty uninspiring PDA. There are plenty of other similarly priced models on the market that manage to be more exciting.

DETAILS

RRP £229 (£195 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Toshiba 0870 444 8943 www.toshiba.co.uk

PROS 32MB of Flash memory

CONS Average screen and performance

VERDICT The E400 is merely an adequate Pocket PC. Everything about it is average

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



Toshiba E800

Toshiba has beaten every other company to market with a PDA capable of showing VGA resolution graphics. However, although the E800 is technically brilliant, it's also a touch ahead of its time. The problem is that Windows Mobile can't cope with a resolution this high, so most of the time you'll be stuck in 240 x 320 mode.

In fact there are only four applications that can be used in VGA mode, and these only allow you to view Word, Excel, Powerpoint and image files, not edit them. There are hacks you can download to allow you to use the high-resolution mode for all the normal applications, but because the Pocket PC menus weren't designed for this resolution it can be tricky to place the cursor.

The other issue with the screen is that the PDA has to be large to accommodate it, with the result that the E800 is significantly bigger than other Pocket PCs.

Nevertheless, this PDA does have a lot going for it. You can choose either a Bluetooth or Wifi model, and there's a powerful 400MHz processor backed up by 160MB of Ram. You also get plenty of expansion potential thanks to the presence of both CF and SD slots.

If you can live with the chunky shape then it's a fine PDA. We just wish the high-resolution screen was properly supported.

DETAILS

RRP £398 (£339 ex VAT)

BEST PRICE www.pcw.co.uk/bestprices

PRODUCT INFORMATION Toshiba

0870 444 8943 www.toshiba.co.uk

PROS VGA screen; lots of Ram

CONS Bulky; screen not properly supported

VERDICT The E800 is technically impressive, but it's a shame the high-resolution screen isn't properly supported

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



Table of features

For the best PDA prices go to www.pcw.co.uk/bestprices

						
MANUFACTURER	FUJITSU SIEMENS	FUJITSU SIEMENS	HP	HP	MITAC	MITAC
MODEL	POCKET LOOX 420	POCKET LOOX 610	IPAQ H4150	IPAQ H5550	MIO DIGIWALKER 168	MIO DIGIWALKER 558
Price inc VAT (ex VAT)	£265 (£218)	£433 (£369)	£276 (£235)	£492 (£419)	£450 (£383)	£440 (£374)
URL	www.pocketloox.co.uk	www.pocketloox.co.uk	www.hp.com/uk	www.hp.com/uk	www.lowestonweb.com	www.lowestonweb.com
Telephone	0800 004 003	0800 004 003	0845 270 4222	0845 270 4222	0870 160 9500	0870 160 9500
HARDWARE						
Operating system	Windows Mobile 2003	Windows Mobile 2003	Window Mobile 2003 Premium	Windows Mobile 2003 Premium	Windows Mobile 2003	Windows Mobile 2003
CPU and speed	400MHz Intel PXA 255	400MHz Intel PXA255	400MHz Intel PXA255	400MHz Intel PXA255	300MHz Intel PXA 255	400MHz Intel PXA263
Ram (MB)	64	128	64	128	64	64
Screen type	Transreflective TFT, 16bit	Transreflective TFT, 16bit	Transreflective TFT, 16bit	Transflective TFT, 16bit	Transreflective TFT, 16bit	Transreflective TFT, 16bit
Screen resolution	340 x 320	240 x 320	240 x 320	240 x 320	240 x 320	240 x 320
Infra-red	x	✓	✓	✓	✓	✓
Wifi	✓	✓	✓	✓	x	✓
Bluetooth	✓	✓	✓	✓	x	✓
Cards supported	SD/MMC	SD/MMC, Type II Compact Flash	SD/MMC	SD/MMC, Type II Compact Flash	SD/MMC	SD/MMC
Weight (g)	125	200	132	206.8	147	170
Dimensions (h x w x d)	113 x 70.6 x 14.1mm	147.5 x 78 x 18.2mm	113.6 x 70.6 x 13.5mm	138 x 84 x 15.9mm	112.8 x 69.6 x 16.3-24.15mm	124 x 72 x 15.3mm
SCORES						
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

						
MANUFACTURER	PALMONE	PALMONE	PALMONE	SONY	TOSHIBA	TOSHIBA
MODEL	TUNGSTEN T3	ZIRE 31	ZIRE 72	CLIE PEG-TJ27	E400	E800
Price (ex VAT)	£269 (£229)	£101 (£89)	£199 (£170)	£170 (£144)	£229 (£195)	£398 (£339)
URL	www.palmone.com/uk	www.palmone.com/uk	www.palmone.com/uk	www.sony.co.uk	www.toshiba.co.uk	www.toshiba.co.uk
Telephone	0118 974 2700	0118 974 2700	0118 974 2700	08705 111 999	0870 444 8943	0870 444 8943
HARDWARE						
Operating system	Palm OS 5.2.1	Palm OS 5.2.8	Palm OS 5.2.8	Palm OS 5.2.1	Pocket PC 2003	Pocket PC 2003
CPU and speed	400MHz Intel PXA255	200MHz Intel Cotulla	312MHz Intel PXA270	200MHz Motorola i.MXL	300MHz Intel PXA 261	400MHz Intel PXA263
Ram (MB)	64	16	32	32	64	128
Screen type	Transreflective TFT, 16bit colour	STN	Transreflective TFT, 16bit	Transreflective TFT, 16bit	Transreflective TFT, 16bit	Transreflective TFT, 16bit
Screen resolution	320 x 480	160 x 160	320 x 320	320 x 320	240 x 320	240 x 320 or 480 x 640, user switchable
Infra-red	✓	✓	✓	✓	✓	✓
Wifi	x	x	x	x	x	Choice of 802.11b or Bluetooth
Bluetooth	✓	x	✓	x	x	Choice of 802.11b or Bluetooth
Cards supported	SD/MMC	SD/MMC	SD/MMC	Memory Stick Pro	SD/MMC	SD/MMC, Type II Compact Flash
Weight (g)	155	116	136	145	137	198
Dimensions (h x w x d)	108 x 73 x 14mm	112 x 74 x 16mm	116 x 75 x 17mm	113 x 75 x 13.2mm	125 x 77 x 10.15/12.49mm	135 x 77 x 16.7mm
SCORES						
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

Editor's Choice

As anyone who has scanned the shelves of their local electronics retailer will know, there is a huge variety of PDAs on the market at the moment. While some models concentrate on advanced features such as fingerprint recognition, others are built around fun additions such as onboard cameras.

As a result there is a large differential in price between high-end models and budget offerings. In fact, many of the really advanced handhelds, such as the HP5550 and Mio Diglwalker 168, only managed to scrape in under the £500 mark, which isn't far off what you'd expect to pay for a budget laptop these days. At the other end of the scale you have units such as Palmone's bargain basement Zire 31 that just tips over the £100 level. This wouldn't have been enough to even buy a scientific calculator a few years ago.

In fact, today's PDAs are light years away from the simple Filofax replacements of the early electronic organisers. They're incredibly powerful machines with most featuring processors that can easily handle movie and music playback. All the machines in this test, for example, feature screens that are capable of displaying thousands of colours, and all but one use the latest TFT technology for razor-sharp visuals that are easy to see even under strong sunlight.

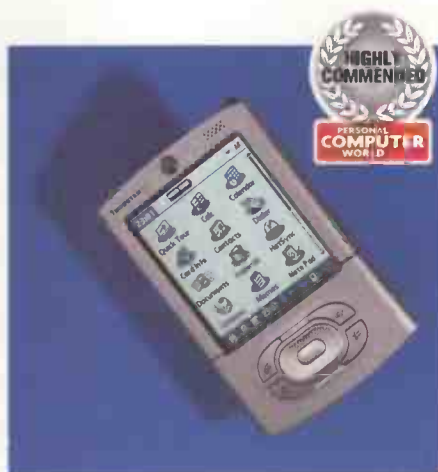
'The majority of the machines on test here were of a high standard'

Wireless technology is also becoming ever more commonplace on the latest portable devices. Bluetooth, for example, is the ideal technology for connecting a PDA to the Internet via a compatible mobile phone while on the move. However, with more and more wireless hotspots appearing and more people sharing their broadband links via wireless Ethernet at home, Wifi support is also a big plus for any PDA. It's a great addition because being able to surf the web at broadband speeds really lets many of the latest machines show their true power.

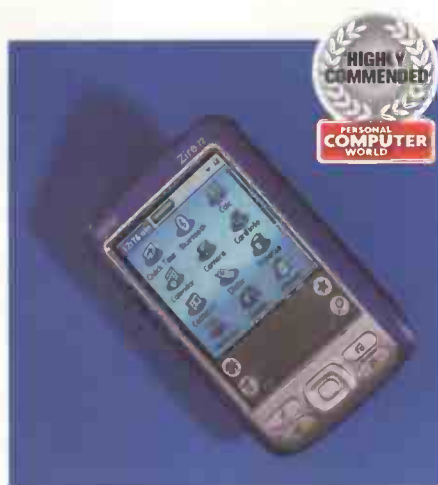
You may have noticed the lack of PDAs from Dell in this test. The company was invited to submit products, but declined.



HP H4150



Palmone T3



Palmone Zire 72

The winners

In fact, support for both of these wireless technologies at a low price point was one of the deciding factors for us when we were choosing the winner of our **Editor's Choice** award. Despite the fact that it weighs in well below the £300 mark, the **HP H4150** offers support for both of these wireless standards. And on top of this it still manages to be one of the smallest and slimmest PDAs on the market at the moment.

We loved its crisp and sharp screen, which is easy to read even in direct sunlight and, despite the relatively low price, the PDA is no slouch when it comes to performance. It sports a 400MHz Intel processor and, although memory is a tad limited at 64MB, it's still more than enough for all but the most power-hungry users. Extra memory can be added via the SD card slot, which can also take SDIO-compatible expansion cards.

The combination of great styling, lots of powerful features and a sensible price make it a great choice for those needing a good all-round performer.

Deciding on the other awards wasn't quite as easy because, quite frankly, the majority of the machines on test here were of a high standard with each having their own particular strengths and weaknesses. In the end we felt that our first **Highly Commended** award deserved to go to the impressive **Palmone T3**.

This machine has a beefy 400MHz processor and a healthy 128MB serving of Ram for storing documents, pictures and music. Naturally there's also a SD card slot for adding extra memory, and the slot is also compatible with SDIO cards so it can even be used for hardware expansion cards.

It's a shame there's no Wifi support, but you do get Bluetooth onboard for connecting to compatible devices such as mobile phones. But the best feature of the T3 is undoubtedly its screen.

The sliding mechanism for the display is a neat party trick, but the ability to rotate the screen from portrait to landscape mode is the real killer feature. In fact, the T3 is a great machine for gadget freaks. It's got lots of power and looks great to boot.

The final **Highly Commended** award goes to the **Palmone Zire 72**. This handheld sits at the top of Palmone's Zire range of PDAs and has some great features, such as a built-in 1.2megapixel camera, Bluetooth support and the new Intel PXA270 processor, which includes Steedstep technology.

With its cute design and fun features, we're sure that this offering from Palmone will appeal to a large audience.

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DDR RAM

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200GB
SERIAL ATA
HARD DISK

200GB hard disk storage with fast 7200rpm speed and ultra fast Serial ATA interface. Massive capacity storing large amounts of photos, videos and other files – Future proof.

256MB
ATI 9800

ATI Radeon 9800 256MB Graphics Card with TV-out and DVI. The ATI 9800 is one of the fastest graphics card ranges available and this product comes with a massive 256MB of dedicated DDR video RAM. Includes twin screen support. Play the latest 3D games in style!

DVD-Rw
DOUBLE LAYER

Latest NEC Double-Layer 8 speed multiformat DVD-Rw drive; 8.5GB instead of 4.7GB; Record 4 hours of DVD-quality or 16 hours VHS quality. Also reads and writes single layer discs - The Best!

DVD x16
DRIVE

Additional DVD-ROM drive to run DVD movies and make one step DVD to DVD copying easy.

WI-FI
WIRELESS

802.11g 54Meg Wi-Fi Wireless system and software. Set your PC as a virtual router to enable other Wi-Fi PCs and Notebooks in the house to share your Broadband Internet and provide wireless home networking.

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RADIO

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- ✓ 10/100 ethernet – for standard networking
- ✓ 1.44MB floppy drive fitted as standard for backwards compatibility
- ✓ 56K dedicated supanet optimised modem*
- ✓ All standard I/O ports and 7 Bay full ATX expandable case.

(Model S2828 Tiny Power Terminator 3.4)

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- ✓ Microsoft Office 2003 60 day trial. Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Outlook.*
- ✓ Microsoft Works 7 – Six integrated applications for wordprocessing, spreadsheet, graphics, filing, address book, calendar etc.
- ✓ Microsoft Windows XP Home Edition

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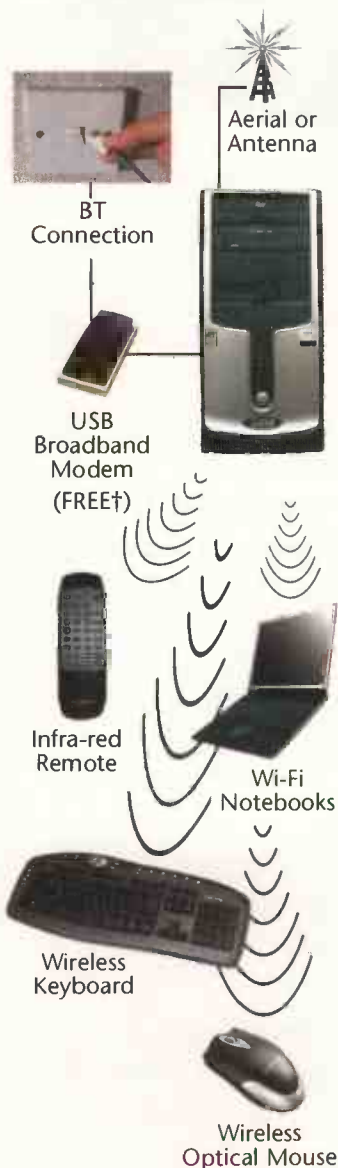
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†FREE SUPANET BROADBAND MODEM – Ask for details

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Unlike other PCs, this is a true digital system incorporating Digital TV and Digital Radio and advanced media centre software.

Digital TV Media Centre

Includes digital TV (Free to View) tuner allowing you to watch TV, record on hard disk and record on DVD Recorder with ease.

- **Watch digital terrestrial TV – use normal aerial – no subscription over 30 Free Channels including ALL BBC (1,2,3,4), ITV(1 and 2), Channel 4, 5, News 24, Sky News plus many more!**

- Fully resizable TV (up to full screen)
- Auto channel scan
- 16 Channel Preview

Digital VCR(PVR) DVD Recorder

- Time Shift™ allows you to continue from where you pause the live show
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- Record video in MPEG 2 quality
- Scheduling Recording

- **Additional AV/S input, be able to connect other video sources(DVD/VCD/VHS/Camcorder)**

- **Support Single and Multiple Still Image Capture**

- **Video Always on Top**

Digital Radio

Digital music from over 30 Free to Air Digital Radio Stations (not DAB) – the best quality music. Record onto your PC for own use only.

Power At Your Fingertips

Includes infrared remote control to make whole process simple.



ULTIMATE CONNECTIVITY

As well as Wireless Connectivity this system also includes all the advanced connectivity found in Power PCs such as Firewire x2, USB 2.0 x5, 10 in 1 Multi-card Reader and all these connections shown below.*

- 1 Keyboard
- 2 Mouse
- 3 Serial
- 4 Printer
- 5 USB x4
- 6 Network/Broadband
- 7 Microphone
- 8 Line-out/ Speakers
- 9 Line-In
- 10 DVI Video output
- 11 Video out
- 12 Aerial socket
- 13 Video In
- 14 Modem cable
- 15 Telephone
- 16 Multi-format card reader and USB



This PC can easily connect to all these things!



TOP PC PERFORMANCE

The superb performance of this PC comes from 5 key elements that you will not find in systems of this price point.

1 Intel Pentium 4 Processor

Intel Pentium 4 processor 3.4GHz with fast bus speed, 1024k cache and Hyperthreading Technology (HT). HT enables the processor to execute two threads in parallel – so you can run multiple digital applications at the same time. New "Prescott" 90nm core with increased performance due to 1024k cache!

2 ATI 9800 256MB Graphics

ATI Radeon 9800 256MB Graphics card with TV-out and DVI provides amazing graphics power, 3D performance and TWIN monitor capability.

3 200GB Serial ATA Storage

200GB high speed 7200rpm and advanced Serial ATA interface (up to 30% faster) – delivers more storage and performance than other systems.

4 Double (1024MB) RAM

Twice as much memory (1024MB) as other power deals that only offer 512MB to further enhance performance.

5 Double Layer DVD Burner

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FEATURES

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- 2kB secure user memory
- NEW** > Clipboard encryption for any text, or program
- Full Windows integration, now supports:
 - > Windows 98 and ME
- NEW** > Windows 2000
- > Windows XP
- NEW** > Archive application
- NEW** > Encrypted offline folders
- Supported storage includes:
 - > Local drives
- NEW** > Network drives
- NEW** > Flash drives
- NEW** > CDR and CDRW
- Email client support for:
 - > Microsoft Outlook
- NEW** > Lotus Notes
- NEW** > Web mail

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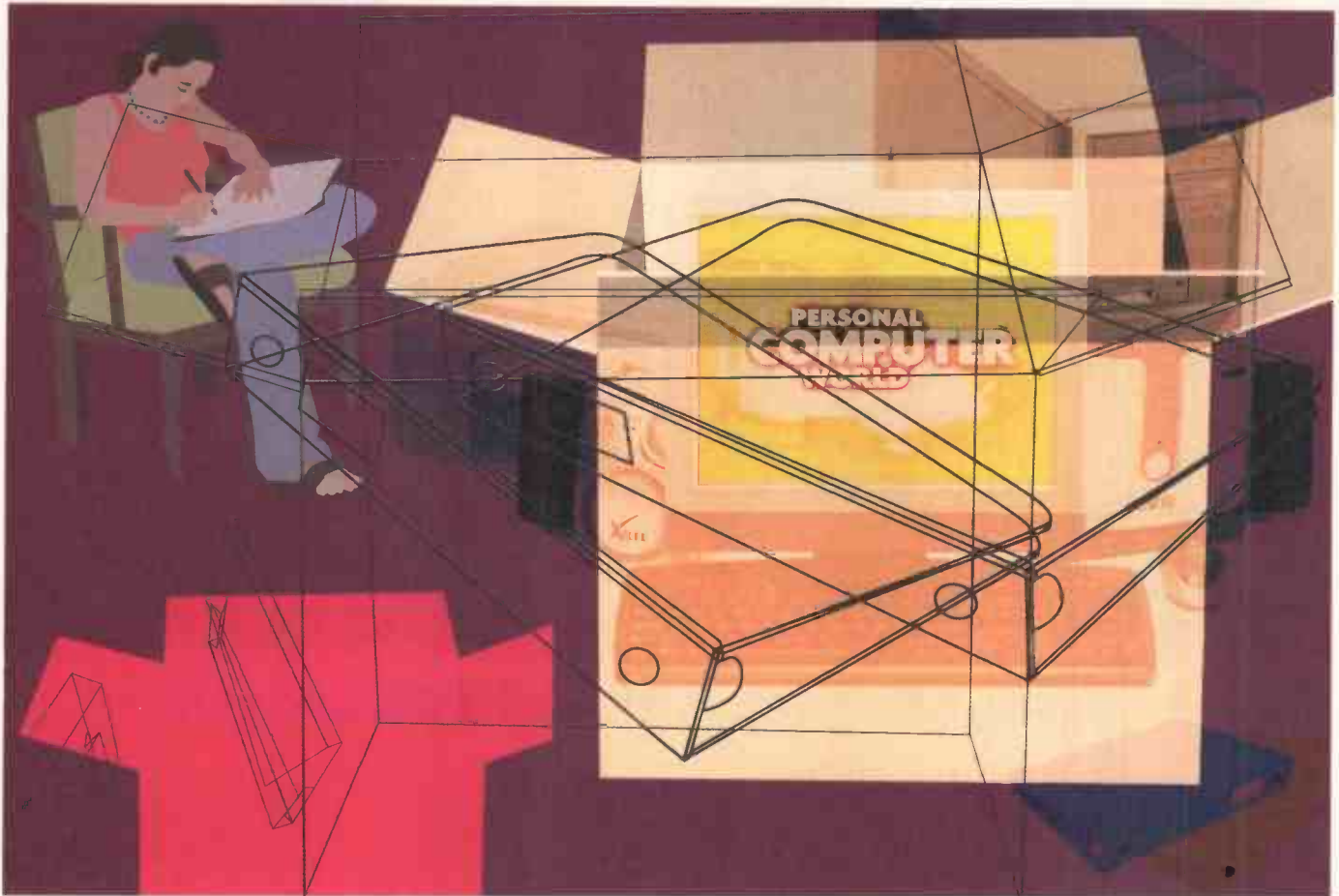
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Want to give your offspring a helping hand at school or university? We take a close look at nine of the latest PC deals that have student needs in mind and cost less than £800 inc VAT

Top of the class

WORDS: WILL STAPLEY TESTING: VNU LABS PHOTOS: BRUCE MACKIE

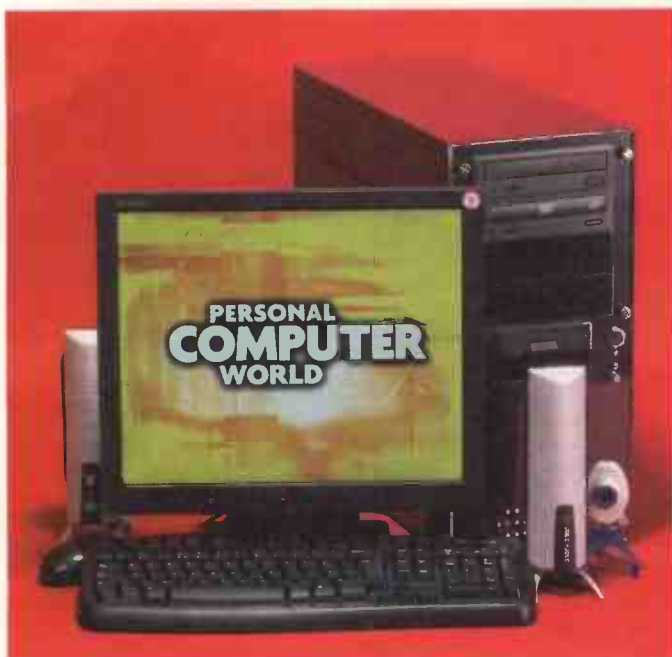
With the new academic year getting ever closer, students up and down the country will be pestering their parents for a new PC. The argument that they won't stand a chance of passing their exams without one often proves too powerful for parents to ignore. Of course, whether it's a matter of passing or failing exams is debatable, but there's no doubt that having your own PC when you are at school or university can be a great help when it comes to completing coursework and feverishly making last-minute changes to dissertations.

This month, we asked nine manufacturers to submit a complete PC system that would suit the needs of the

average student. Not the stereotypical student, who enjoys drinking all day in the pub and skipping lectures to play games, but rather those who want to strive for a good grade and stay up all night to tweak their latest assignment.

We decided to set the price point at £799, including VAT and delivery, in the belief that this would allow manufacturers to put together a solid system with a few added extras.

We expected systems capable of light, rather than top-end gaming, so we weren't looking for the likes of high-end graphics cards and lightning-fast processors. Instead, we were after solid performing systems with decent software packages and perhaps some other relevant peripherals.



Carrera Academy 64

Carrera kicks off this month's group test with a 64bit processor from AMD in the form of an Athlon 64 3000+. With a clock speed of 2GHz, most students won't require a faster model. Like every other system in this group test, this is backed up with 512MB of Ram.

The 7,200rpm Excelstor hard drive has a capacity of 80GB, while two optical drives grace the front of the attractive acrylic-fronted case. The first is NEC's 2500A DVD-RW, which is capable of eight-speed writing to both DVD+R and DVD-R, while a Sony DVD-Rom drive occupies the second 5.25in bay.

An Nvidia Geforce FX 5500 graphics card was never going to return hugely impressive scores in our benchmarks, but then again we're not looking solely for great 3D performance this month. You'll easily be able to play games at lower detail settings, but it will struggle with the latest games. The Academy 64 handled PCmark 2004 and Sysmark 2004 much better, and these two benchmarks are more relevant to students.

We were keen to see what sort of displays were going to be included with this month's systems, and Carrera has squeezed a decent model into this deal. We've seen more than

a few Sharp LL-T17A4-B 17in LCD screens in the past and there's no doubt that it's a quality display. What's more, with a street price of around £350 it's not that cheap.

Turning to the software, XP Home Edition is complemented by Microsoft Works Suite 2004. This package houses the full version of Works 7, along with some other titles including Microsoft Word, Money 2004 (www.pcw.co.uk/Products/Software/1145411) and Encarta Encyclopaedia 2004.

With acceptable performance, a quality monitor and a range of decent components, the Carrera Academy 64 is a solid effort.

DETAILS

RRP £799 (£680 ex VAT)

PRODUCT INFORMATION

Carrera

0871 222 3456

www.carrera.co.uk

PROS Decent screen; software package

CONS Gives an average 3D performance

VERDICT

Carrera has delivered a good all-round system with a fast processor and a decent software package

FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL



Demonite Graduate 64

It doesn't sport the garish green colour scheme we've become so accustomed to with Demonite in past reviews, but this imposing case towers above the other models in this group test. Not only will it require a fair bit of room under your desk, but you'll also need strong arms just to get it there in the first place. There are four 5.25in drive bays behind the flip-door to the case, and there's plenty of room for expansion, since there is only a Sony DVD-RW drive installed.

Demonite has a habit of overclocking systems sent in for review, and since it has no effect on the warranty we don't have any issues with this practice. In this instance, the powerful Athlon 64 3000+ processor has been given an extra boost by increasing the clock speed from 2GHz to 2.3GHz.

It comes as no surprise, therefore, that this Demonite system eclipsed the other PCs in all but one of our benchmarks. What's more, the results returned in most of the tests were way ahead of the next fastest machine. Undoubtedly, the Nvidia Geforce FX 5900XT graphics card was a big help when it came to achieving these impressive scores.

Just like the Sharp LCD monitor with the Carrera

screen is an impressive addition, especially considering the £799 price point of this group test.

The bundled Microsoft Works 7 isn't the most powerful of office applications, but it does include a word processor, spreadsheet creator and other useful tools such as a calendar and address book.

Many students simply won't require the power this system is capable of delivering, but for the likes of software engineering and media courses it may well be put to good use. On the other hand, it could be that the slightly lacking software package is more of a concern to you.

DETAILS

RRP £799 (£680 ex VAT)

PRODUCT INFORMATION

Demonite

0871 222 7222

www.demonite.com

PROS Great performance; decent screen

CONS Lacking in software; looks a little bulky

VERDICT

If you have a need for speed, then this is the one for you, but it lacks a little in student-related software

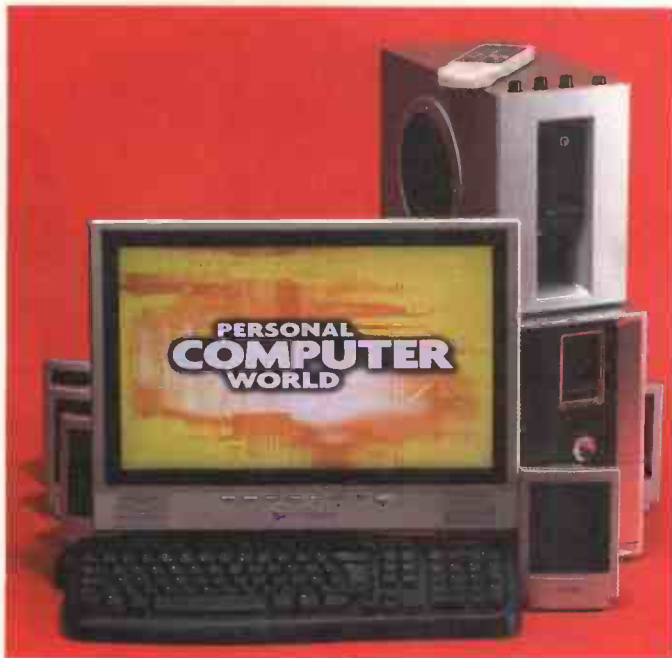
FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL





ECS EZ-Buddie V7-2

Student halls often don't provide the most spacious of living arrangements, and ECS' familiar, stylish and compact EZ-Buddie case does its best to take up as little space as possible. Looking more like a hifi than a PC, it sports an LED along with other features such as a multiformat card reader.

While the EZ-Buddie V7-2 looks good, a quick glance at the benchmark graphs shows that it could never be described as a gaming machine. The reason for its lacklustre 3D performance is clear. The onboard graphics solution, which requires the 512MB system memory to allocate 32MB to it, isn't adequate when it comes to playing games. It really is a shame, since even something as cheap as an Nvidia FX 5200 would have made a big difference. Although the Sysmark 2004 and PCmark 2004 results were the lowest in the group test, they weren't that far off the rest and, as with other EZ-Buddie systems, you can overclock the it using the dial on the front of the case. If things start getting a bit hot, the PC will automatically shut down.

What saves this system is the monitor: not only is this 17in LCD a widescreen model, but it also has a co-ax input that

allows you to hook it up to a TV aerial. Thanks to the remote control, it doubles up as a high-quality TV that will no doubt be of interest to students with limited space in their room. Combine this with the 5.1 surround-sound speakers, and you've got a decent home cinema or audio system.

With its poor 3D benchmark scores, the EZ-Buddie will require an upgrade if you're looking to run graphic intensive applications, let alone games, but for Internet access, email and word processing it will do fine. Meanwhile the widescreen LCD-TV monitor is an added bonus and a real space saver.

DETAILS

RRP £799 (£680 ex VAT)
PRODUCT INFORMATION
 ECS
 0870 120 5370
www.ecs.uk.com

PROS LCD-TV; stylish and compact case

CONS Poor performance; no software

VERDICT

Taking up barely any space at all and offering an LCD-TV, it's got its plus points, but performance is sadly lacking

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



Evesham Axis 30AS

With an Athlon 64 3000+ processor and 512MB of Ram sitting on the MSI motherboard, Evesham's Axis 30AS is off to a solid start. The Western Digital hard drive, with a 120GB capacity, continues this theme.

Evesham was one of only two manufacturers to bundle a multifunction device with its system. With 4,800 x 2,400dpi printing and 1,200 x 2,400dpi scanning capabilities, the Canon Smartbase MP360 would suit the needs of most students extremely well. You can expect to pay around £100 for this model if you wanted to buy it separately, so Evesham has done well to include it in this £799 group test.

Large LCD screens are great, but they don't come cheap. Evesham is one of a few manufacturers that aren't afraid to supply a CRT model, which is fine as long as the money saved is spent on something else. While the 17in Viewsonic monitor might not have quite the same appeal as an LCD screen, if it means Evesham can include the Canon Smartbase MP360 then we feel it's well worth forgoing an LCD monitor.

In all our benchmarks the Axis 30AS managed to return respectable scores. Thanks to its impressive office productivity

result, it was the only system that managed to stop the Demonite entry making a clean sweep in our tests.

Graphics performance was helped by the inclusion of the ATI Radeon 9600 graphics card. It's not the fastest model around, but the 9600 is able to run most games at reduced detail levels. Meanwhile, the software package includes the impressive Works Suite 2004.

It's hard to point out any faults with the Axis 30AS. Based on a solid pairing of an Athlon 64 3000+ and 512MB of Ram, it performs well and you get the added bonus of a decent multifunction Canon device.

DETAILS

RRP £799 (£680 ex VAT)
PRODUCT INFORMATION
 Evesham
 0870 160 9500
www.evesham.com

PROS Multifunction device; value for money

CONS Reasonably small CRT

VERDICT

If the 17in CRT doesn't impress you, then you'll have to look elsewhere, but in our minds this is an excellent student PC

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



Intellect Prodesk 3000/64S

Intellect's Prodesk 3000/64S is yet another system to make use of AMD's Athlon 64 3000+ processor and 512MB of Ram. It's a powerful pairing and one that should cut the mustard for some time to come.

We don't often see drives from BTC in group test submissions, but there's one in this Intellect machine providing DVD writing capabilities. Like the NEC 2500A drive, it can write at eight-speed to both DVD formats. Ample disk space is provided by Maxtor's 7,200rpm drive, which will store up to 120GB of data.

We were a little disappointed to find that Intellect had only included a 15in LCD screen. While the quality of this Sharp display isn't in question, the fact remains that if you've got more than one window open, things soon start to get a little crowded, especially when the native resolution on 15in screens is 1,024 x 768. However, with a small footprint it would fit well on a cluttered desk.

Our benchmark tests didn't throw up any real concerns. With similar base components as the Carrera Academy 64, it's no surprise that the results were almost identical. The Prodesk 3000/64S did, however, achieve a notably better result in the Sysmark 2004 test. If you want to play the latest games – once

you've completed your assignments of course – you might want to upgrade the Nvidia Geforce FX 5500 graphics card for something a little more substantial. In the meantime, most students should find it adequate for their needs.

While performance was solid, we expected to see a little more in the way of features with this system from Intellect. As with ECS, the software package only consisted of Windows XP Home Edition, which is disappointing.

Overall, the Intellect Prodesk 3000/64S offers the basis of a good student PC, but you'll need to buy an office package of some description.

DETAILS

RRP £799 (£680 ex VAT)
PRODUCT INFORMATION

Intellect
0870 122 5590

www.intellectcomputers.co.uk

PROS Good overall performance

CONS No bundled application software

VERDICT

It would have been good to see a few more features included, but this Intellect system does deliver decent overall performance

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



Mesh Matrix64 3000+ LRN

Mesh continues this month's theme for AMD processors, and pairs an Athlon 64 3000+ with 512MB of Ram. Everything is housed in the familiar, sturdy black Mesh case and, like Intellect and Tiny, Mesh could only find room for a 15in TFT monitor. We can have no complaints over the quality of the Sharp LL-T15A4-B screen, but perhaps a larger CRT monitor would have been a better choice and could even have made a saving.

Mesh has chosen the same DVD writer as found in the Demonite, and with write speeds of eight-speed for both DVD+R and DVD-R formats, it's a versatile drive that will serve you well. The hard drive comes in the form of a 160GB Maxtor.

The Matrix64 3000+ LRN cruised through our tests and clocked up respectable scores in every one of them. It didn't manage to eclipse the likes of the Demonite system, but if you take a look at the results page you'll see that it wasn't far off the pace. The Nvidia Geforce FX 5700LE held the 3D scores back a little, but with 256MB of Ram devoted to it, it's not the slowest graphics card this month.

Along with the Home Edition of Windows XP, Mesh has included a copy of Works 7.

This can look a little dated when compared with Microsoft Office, but it houses most of the tools students might need. Mesh has also thrown in two Pinnacle software packages, namely Instant CD/DVD and the second edition of the popular Studio 9 video-editing package. Editing home movies might not be essential, but those studying media courses might find it useful, especially combined with the massive hard disk.

Apart from the small LCD monitor, we don't have any major issues with this Mesh system. It's a good all-round performer and has a good collection of basic software.

DETAILS

RRP £799 (£680 ex VAT)
PRODUCT INFORMATION

Mesh
0870 046 4747

www.meshcomputers.com

PROS Good performance; software package

CONS Only a 15in LCD screen

VERDICT

This is a good all-round system from Mesh, but a large CRT may have been a better choice than the 15in LCD monitor

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



Microland PCW 27.09

Like the majority of PCs in this group test, Microland's PCW 27.09 comes with 512MB of Ram and AMD's Athlon 64 3000+ processor with a clock speed of 2GHz.

The Maxtor 7,200rpm 80GB hard disk is enough to get started, but you may need to upgrade, especially if you have a large mp3 and video collection. Like most of the other entries this month, just one optical drive is fitted – in this case it's the impressive NEC 2500A DVD-RW that can write both DVD formats at eight-speed.

An ATI Radeon 9800 Series card, one of the fastest in this test, handles the graphics. As a result, it achieved impressive 3Dmark 2003 and Unreal Tournament benchmark scores. That said, the Demonite system, with its FX 5900XT, beat it by some way. The other test results showed the PCW 27.09 to be a solid performer, with a particularly strong PCmark 2004 score.

In terms of the software package, we have no qualms with the Home Edition of XP, and WinDVD 4 from Intervideo will obviously come in handy, but the Small Business Edition of Office 2003 seems as an odd choice (see www.pcw.co.uk/Products/Software/1154824). Compared to the far cheaper Student and Teacher Edition,

the only real differences are the inclusion of Publisher 2003 and the Business Contact Manager for Outlook, both of which we feel the average student is unlikely to use.

The very impressive 3D performance, especially at this price point, will attract those wanting to run games, while the solid PCmark 2004 score means it will have no problem running intensive applications either. If the Samsung CRT monitor doesn't bother you – remember the actual viewable size is only one inch greater than a 15in LCD model – then the PCW 27.09 is well worth considering.

DETAILS

RRP £799 (£680 ex VAT)
BEST PRICE
www.pcw.co.uk/bestprices
PRODUCT INFORMATION
 Microland 0870 443 0399
www.microlandtechnology.co.uk
PROS 3D performance;
 software package
CONS Only a 17in CRT monitor
VERDICT
 With the CRT monitor saving money we expected a few more extra features, but it's still a decent system

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

Office 2003 Student and Teacher Edition

It's common knowledge that Microsoft sells its latest Office 2003 suite in Professional and Standard Editions, but what's not quite so well known is that it also comes in a Student and Teacher Edition. This special edition offers the same features as the Standard Edition (Word, Excel, Outlook and Powerpoint), but the bonus is that you get it for a fraction of the normal street price.

Microsoft doesn't give RRP's for its products, but Office 2003 Standard Edition currently retails on Amazon.co.uk for around £300, which is a lot for any student, and enough to make you look elsewhere for your office needs. The Student and Teacher Edition, which is also available on www.amazon.co.uk, is on offer for just £98.

Not only does the Student and Teacher edition give you a substantial discount on the standard list price, but you also get the added bonus of three licences. This means you can install a copy on your computer at university, one on your computer back at home and another on a notebook.

As you'd expect, this discounted edition is only available to either teachers or students in full-time education. So, if you or your child is at school or just heading off to university, you qualify. The scheme is founded on trust, and if you walk in to a store and ask for a copy you'll more than likely just be asked whether you, or the person you're buying it for, is a student. Of course, if you buy a copy with no intention of letting a student or teacher anywhere near it, you'll be breaking the licence agreement. Furthermore, since this edition is meant solely for students and teachers, part of the licensing agreement is that it's for non-commercial use only.

If you want to find out more about Office 2003 and the various editions, go to www.microsoft.com/office, or contact your local computer store.

While Microsoft Office often hogs the limelight, there are plenty of alternatives, some of which are far cheaper. Ability Office 4 (www.abillity.com) will soon hit the shelves and has a striking similarity to Microsoft Office 2003, while Star Office (www.sun.com/staroffice) is a popular choice for those on a budget. To learn more about what's available, read our recent group test of office suites at www.pcw.co.uk/Products/Software/1154805.

Alternatively, Openoffice, based on Star Office, can be downloaded free and comes with decent word processing, spreadsheet and presentation packages – you'll find a full version on both the May and July DVD editions of PCW.

Home Computing Initiative

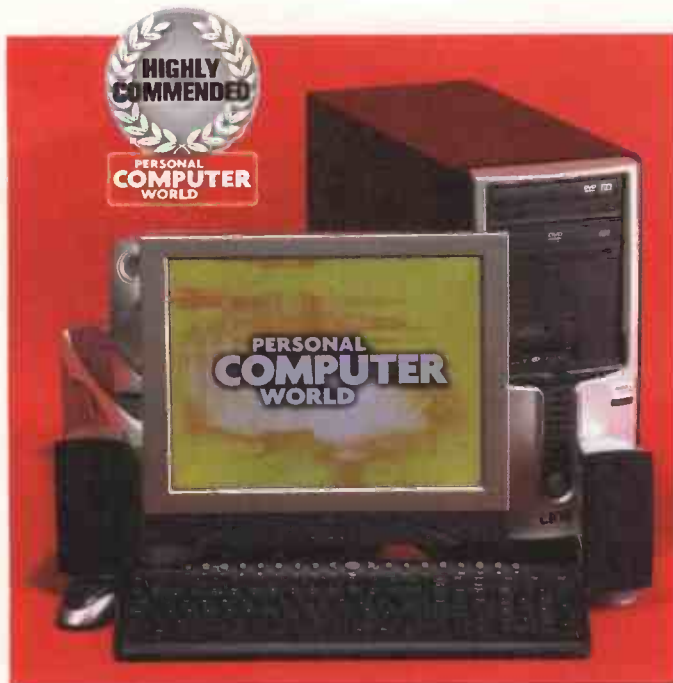
There's also another way that you can save money when it comes to buying a new PC. The Home Computing Initiative (HCI) suffered a bit of a false start in 1999, but now the government has relaunched it with the backing of industry giants Microsoft, Intel and BT.

The scheme grants employers tax breaks if they offer their staff the chance to take out a loan to buy a PC. This tax-exempt system allows employees to have the loan repayments made through their salary, and can lead to discounts of up to 50 per cent on high-street store prices.

The Government's aim is to get a PC in every household and there's nothing to stop you giving your children a PC of their own. You can read more about the HCI scheme and what it has to offer at www.pcw.co.uk/News/1152066.



Save £200 with the Student and Teacher Edition of Office 2003



Tiny Student XP3000 VQ

Based around AMD's 32bit XP 3000+ processor, which has a clock speed of 2.17GHz and 512MB of Ram, the Student XP3000 VQ comes in a black and silver case that houses a multiformat card reader and front-access USB and Firewire ports.

Two optical drives are installed in the form of a multiformat DVD writer from MSI and a standard DVD-Rom drive. A single Seagate 7,200rpm hard drive provides 160GB of storage space, which should be plenty for most students.

The Nvidia Geforce FX5700LE graphics card has 256MB of Ram devoted to it, which helped the Student XP3000 VQ to achieve a decent score in our 3Dmark 2003 benchmark. The score of 132 in the Sysmark 2004 test was what we expected from this Athlon XP machine, and it shows it really can't match the raw power of the newer Athlon 64 processors.

The Time-branded LCD monitor won't disappoint, but, as with the other two LCD 15in screens, we feel that a larger CRT would have been a better choice.

Tiny has squeezed in a multifunction device with the Student XP3000 VQ. The HP PSC 1205 is a neat looking device that's capable of printing at 4,800 x 1,200dpi and scanning at 1,200 x 1,200dpi.

Quality is on a par with the Canon multifunction device in Evesham's bundle, and its small footprint means it doesn't take up much desk space.

The Student and Teacher Edition of Office 2003 pairs up with the Home Edition of Windows XP to offer a sound base for any student, while the Eidos Games Pack is at hand should you need a break from your studying.

The Student XP3000 VQ might not be the fastest PC around and the 15in display is a little small, but thanks to the inclusion of the HP PSC 1205, we can see more than a few students being attracted to it.

DETAILS

RRP £798.99 (£679.99)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Tiny 01282 777 555

www.tiny.com

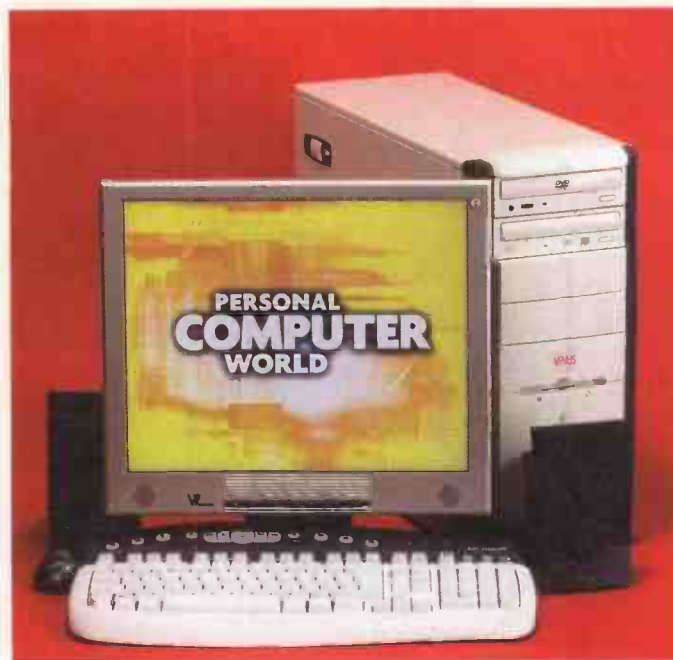
PROS Multifunction device; good software

CONS 15in LCD; not the fastest PC

VERDICT

It's not the quickest machine, but with Office 2003 and a multifunction device it is a great PC for students

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



Venus Power 3000+ for Students

Housed in a cream case that looks a little dated compared to the rest, Venus has chosen to submit its PC with an AMD Athlon XP 3000+ clocked at the standard 2.17GHz. Like every other system in this group test, 512MB of Ram is supplied to support this 32bit processor.

Two Sony optical drives come as standard, one a DVD-RW and the other a DVD-Rom, while the Hitachi hard drive has a 160GB capacity. The 17in Videoseven TFT performs adequately and looks good alongside the 15in LCDs in this group test.

Our benchmarks proved to be quite a test for the Venus system. It struggled to make an impact against the other machines and came second from bottom in all of the tests. However, the Sysmark 2004 and PCmark 2004 results aren't too much of a concern, and you won't have any trouble using it as a PC for work purposes. If 3D performance is still important to you, the 3Dmark 2003 and Unreal Tournament scores show that this machine isn't designed for gamers. The main culprit for this is the Nvidia Geforce FX5200 graphics card, which would need to be replaced if you want to play the latest games.

Venus has done a good job in terms of the software package. Along with Windows XP,

there's the Student and Teacher Edition of Microsoft Office (www.pcw.co.uk/Products/Software/1154824). With this special edition you get the 2003 versions of Word, Excel, Outlook and Powerpoint, which covers most bases as far as students are concerned. Combine this with Cyberlink Power DVD, Pinnacle Instant CD/DVD and Encarta Encyclopaedia, and you've got a decent selection of titles.

All in all, this is a solid effort from Venus and, while it couldn't match the pace of the Athlon 64 PCs, it comes with a sizeable monitor and quality software selection.

DETAILS

RRP £799 (£680 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Venus 0845 006 8833

www.venuscc.com

PROS Software package; 17in screen

CONS Not amazingly powerful

VERDICT

It couldn't keep up with the Athlon 64s, but as a student PC it scores well and has a good software package

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



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E&OE July 2004

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VP201b PC Format
July 2004 Issue



VP201b Custom PC
June 2004 Issue



VP201b PCW
August 2004 Issue

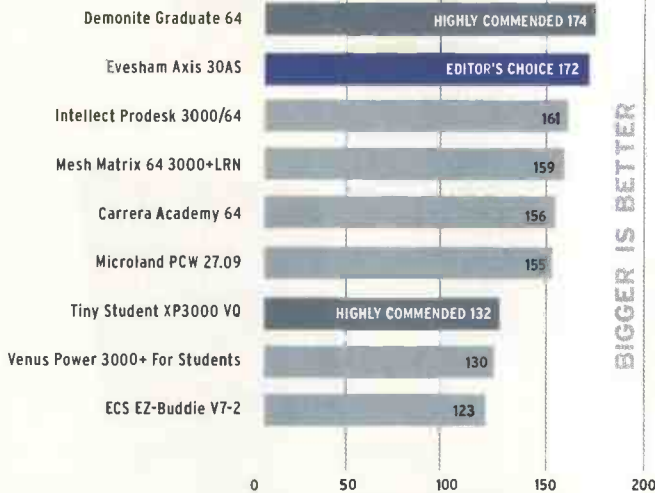
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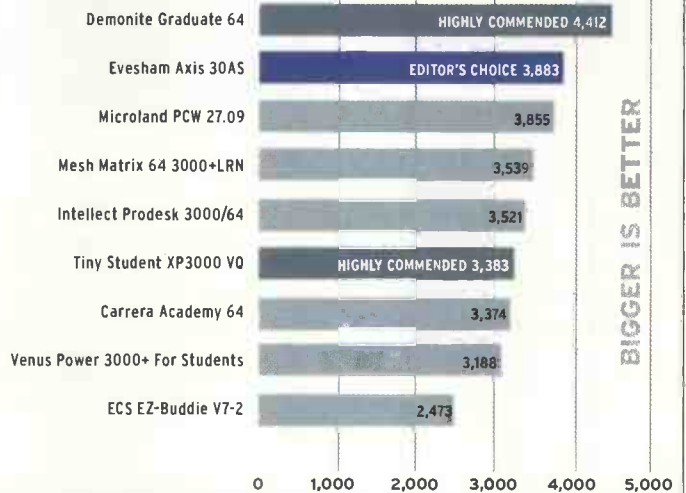
Lab results



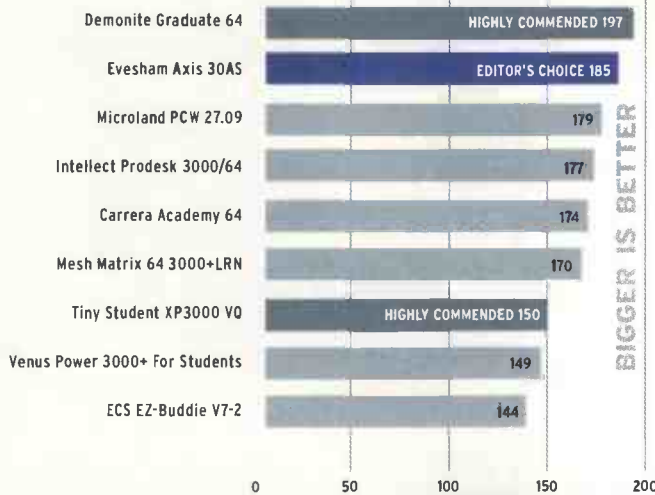
Sysmark 2004



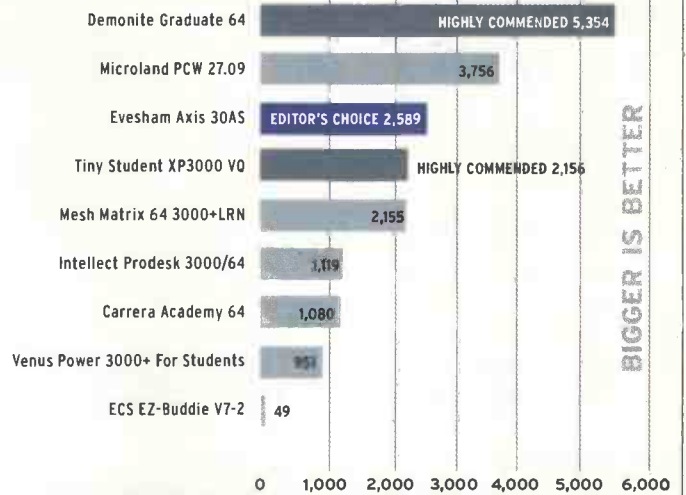
PCmark 2004



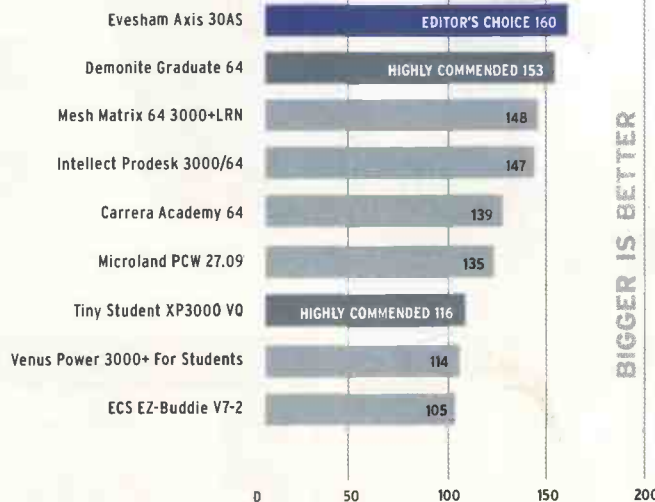
Sysmark 2004 Internet content creation



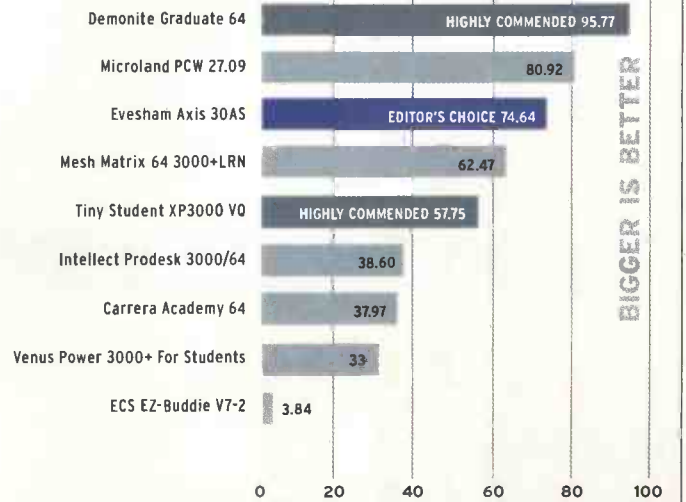
3Dmark03 (1,024 x 768 at 32bit)



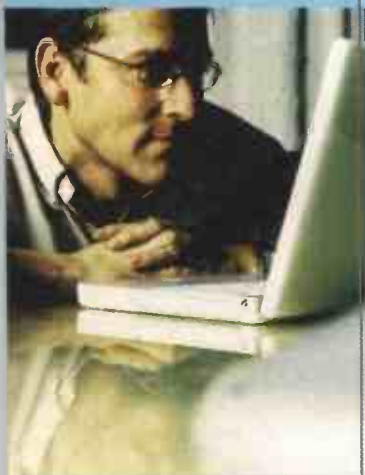
Sysmark 2004 office productivity



Unreal Tournament (fps) (1,024 x 768)



Please see page 12 for an explanation of how we tested the PCs



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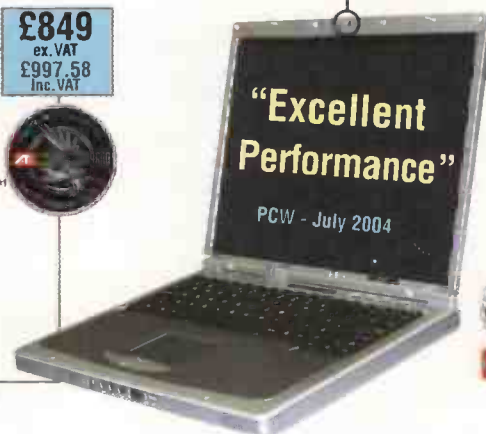
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- Carry Case, 36 months RTB Warranty***
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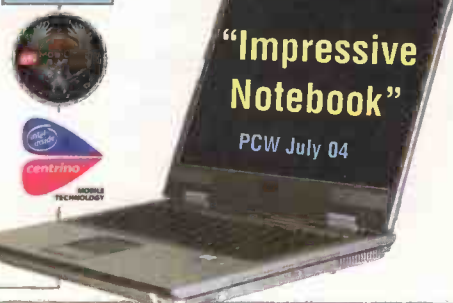
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*2 - Buy Now Pay Later typical example based on £1000 purchase price. 5% deposit required at point of purchase (£50) then pay nothing for 11 months. On the 12th month choose to settle the balance in full of £950 (no interest) or start a 36 month repayment plan (interest calculated from date of ordering) of £56.71, total amount payable £2041.56 29.8% APR. Finance is subject to status. Terms & Conditions apply. Written quotations available on request. Applicants must be over 18, under 75 and in full time employment. Fee may apply.

AJP™

Making IT Happen

Group test>> Student PCs

Table of features

					
MANUFACTURER	CARRERA	DEMONITE	ECS	EVESHAM	
MODEL NAME	ACADEMY 64	GRADUATE 64	EZ-BUDDIE V7-2	AXIS 30AS	
Price inc VAT (ex VAT)	£799 (£680)	£799 (£680)	£799 (£680)	£799 (£680)	
Telephone	0871 222 3456	0871 222 7222	0870 120 5370	0870 160 9500	
URL	www.carrera.co.uk	www.demonite.com	www.ecs.uk.com	www.evesham.com	
HARDWARE SPECS					
Processor	Athlon 64 3000+, 2GHz	Athlon 64 3000+, 2.3GHz	Athlon XP 3000+, 2.17GHz	Athlon 64 3000+, 2GHz	
Memory quantity and type	512MB PC3200 DDR	512MB PC3200 DDR	512MB PC2100 DDR	512MB PC3200 DDR	
Occupied/spare memory (Ram) slots	2/0	2/0	2/0	2/1	
Max memory in this configuration	512MB	512MB	480MB	1.5GB	
Max memory supported by motherboard	2GB	2GB	2GB	2GB DDR400 3GB DDR333	
Hard disk	Excelstor Technology J680, 7,200rpm, Ultra-ATA/100	Excelstor Technology J680, 7,200rpm, Ultra-ATA/100	Hitachi HDS722516VLAT80 7,200rpm, Ultra-ATA/100	Western Digital WDC WD1200JB-00EVA0	
Hard disk size	80GB	80GB	160GB	120GB	
Motherboard	Asrock K8S8X	Asrock K8S8X	ECS KM400-M Deluxe/KM400-M2	MSI MS-7030	
Chipset	Sis 755, AMD Hammer	Sis 755, AMD Hammer	Via VT8378A Unichrome KM400A	Nvidia Nforce3-S, AMD Hammer	
EXPANSION AND I/O					
No of 3.5/5.25in bays	7/4	6/4	1/1	4/4	
No of free 3.5/5.25in bays	5/2	4/3	0/0	2/2	
No of PCI/shared ports	5/0	5/0	1/0	5/0	
No of free PCI/shared ports	4/0	4/0	1/0	4/0	
No of USB2/Firewire ports	6/1	6/1	5/1	6/1	
No of serial/parallel/PS/2 ports	1/1/2	1/1/2	1/1/2	1/1/2	
MULTIMEDIA					
Primary optical drive	NEC DVD-RW ND-2500A	Sony DVD-RW DW-U18A	Toshiba DVD-Rom SD-R1312	Sony CD-RW CRX320E	
Drive speed	DVD+RW: 8x/4x, DVD-RW: 8x/4x, DVD-Rom: 12x, CD: 32x/16x/40x	DVD+RW: 4x/8x/12x, DVD-RW: 2x/8x/12x, CD-RW: 24x/40x/40x	DVD: 12x, CD: 32x/10x/40x	DVD: 16x, CD: 52x/32x/52x	
Secondary optical drive	Sony DVD-Rom DDUI612	N/A	N/A	N/A	
Drive speed	DVD-Rom: 16x, CD-Rom: 40x	N/A	N/A	N/A	
Sound card	C-Media AC97	C-Media AC97	Realtek AC97	Nvidia Nforce TM	
Speakers	Capricorn CP-2000	Built-in monitor speakers	Orbit H8000	Altec Lansing I21	
Graphics card	Leadtek Nvidia Geforce FX 5500	Winfast Nvidia Geforce FX 5900XT	Via/S3G KM400/KN400	ATI Radeon 9600 Series	
Chipset	Nvidia Geforce FX 5500	Nvidia Geforce FX 5900XT	Via/S3G KM400/KN400	Radeon 9600 Series	
Memory	128MB	128MB	32MB Shared memory	128MB	
Monitor	Sharp LL-T17A4-B	NEC Accusync LCD71VM	ECS EZV17A	Viewsonic E70f+SB	
Monitor max viewable diagonal	17in	17in	17in	16in	
Maximum resolution	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	1,280 x 1,024	
OTHER INFORMATION					
Bundled peripherals and software	Microsoft Windows XP Home Edition, Microsoft Works Suite 2004	Microsoft Windows XP Home Edition, Microsoft Works 7	Microsoft Windows XP Home Edition	Canon Smartbase MP360 multifunction device, Microsoft Windows XP Home Edition, Microsoft Works Suite 2004, Intervideo WinDVD 4, Pinnacle Instant CD/DVD, Pinnacle Studio V9SE	
Standard warranty (RTB = return to base, C&R = collect and return)	3yrs on site, 2yrs RTB	3yrs on site, 2yrs RTB	1yr RTB	2yrs on site, 1yr RTB	
SCORES					
Features	★★★★★	★★★★★	★★★★★	★★★★★	
Performance	★★★★★	★★★★★	★★★★★	★★★★★	
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	
Overall	★★★★★	★★★★★	★★★★★	★★★★★	

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PRODESK 3000/64S

£799 (£680)

0870 122 5590

www.intellectcomputers.co.uk

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MATRIX64 3000+ LRN

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www.meshcomputers.com

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www.microlandtechnology.co.uk

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01282 777 555

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£799 (£680)

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Athlon 64 3000+, 2GHz
512MB PC3200 DDR SD-Ram

1/2

2.5GB

3GB

Maxtor 6Y160M0 7,200rpm,
Serial-ATA/150

120GB

Gigabyte GA-K8NS

Nvidia Nforce3-S, AMD Hammer

Athlon 64 3000+, 2GHz
512MB PC3200 DDR SD-Ram

2/1

1.5GB

3GB

Maxtor 6Y160M0 7,200rpm,
Serial-ATA/150

160GB

Asus K8V Deluxe

Via VT8383 Apollo K8T800,
AMD Hammer

Athlon 64 3000+, 2GHz
512MB PC3200 DDR SD-Ram

1/2

2.5GB

3GB

Maxtor 6Y080M0 7,200rpm,
Serial-ATA/150

80GB

Gigabyte GA-K8N Pro

Nvidia Nforce3 150, AMD Hammer

Athlon XP 3000+, 2.17GHz
512MB PC2700 DDR SD-Ram

1/2

1.5GB

2GB

Seagate ST3160021A 7,200rpm,
Ultra-ATA/100

160GB

MSI MS-6775

Via VT8377 Apollo KT600

Athlon XP 3000+, 2.17GHz
512MB PC2700 DDR SD-Ram

1/3

2.5GB

3GB

Hitachi HDS722516VLAT20
7,200rpm, Ultra-ATA/100

160GB

Gigabyte GA-7VT600 1394

Via VT8377 Apollo KT600

3/4

0/2

5/0

4/0

6/0

2/1/2

4/3

2/2

5/0

4/0

6/2

1/1/2

6/4

4/3

5/0

4/0 (3 usable)

6/2

2/1/2

3/3

1/1

5/0

4/0

5/2

1/1/2

6/4

4/2

5/1

4/0 (3 usable)

8/2

2/1/2

BTC DRW1108 IM

DVD+/-R: 8x, DVD+/-RW: 4x,
CD-R: 40x, CD-RW: 24x

N/A

N/A

Realtek AC97

Aopen C94

Gigabyte Nvidia GeForce FX 5500

Nvidia GeForce FX 5500

128MB

Sharp LL-T15A4-B

15in

1,024 x 768

Sony DVD-RW DW-U18A

DVD+RW 4x/8x/12x, DVD-RW:
2x/8x/12x, CD-RW: 24x/40x/40x

N/A

N/A

Soundmax

Creative Inspire 5.1 P580

MSI Nvidia GeForce FX 5700LE

Nvidia GeForce FX 5700LE

256MB

Sharp LL-T15A4-B

15in

1,024 x 768

NEC DVD-RW ND-2500A

DVD+RW: 8x/4x, DVD-RW: 8x/4x,
DVD-Rom: 12x, CD: 32x/16x/40x

N/A

N/A

Realtek AC97

Creative MF4000

Radeon 9800 Series

Radeon 9800 Series

128MB

Samsung 753DFX

16in

1,280 x 1,024

MSI MS-8404A

DVD-R: 4x, DVD+R: 4x, DVD-RW: 2x,
DVD+RW: 2.4x, CD: 40x

Artec DHM-G48R

DVD-Rom: 16x, CD-Rom: 48x

Realtek AC97

Speaker X1000

MSI Nvidia GeForce FX 5700LE

Nvidia GeForce FX 5700LE

256MB

Time CL150G

15in

1,024 x 768

Sony DVD-RW DW-U18A

DVD+RW: 4x/8x/12x, DVD-RW:
2x/8x/12x, CD-RW: 24x/40x/40x

Sony DVD-Rom DDU1621

DVD-Rom: 16x, CD-Rom: 40x

Realtek AC97

Creative MMS30

XXF Nvidia GeForce FX 5200

Nvidia GeForce FX 5200

128MB

Videoseven L17PS

17in

1,280 x 1,024

Microsoft Windows XP
Home Edition

3yrs on site

Microsoft Windows XP Home
Edition, Microsoft Works 7,
Pinnacle Instant CD/DVD,
Pinnacle Studio V9SE

1yr on site, 2yrs RTB
(parts and labour)

Microsoft Windows XP
Home Edition, Microsoft Office
Small Business Edition 2003,
Intervideo WinDVD 4

3yrs C&R

HP PSC 1025 multifunction device,
Microsoft Windows XP Home
Edition, Microsoft Office Student
& Teacher Edition 2003, Eidos
Games Software Pack

3yrs RTB

Sweex 56K PCI Modem, Microsoft
Windows XP Home Edition,
Microsoft Office Student & Teacher
Edition 2003, Cyberlink Power DVD,
Pinnacle Instant CD/DVD, Encarta
Encyclopedia Standard 2004

1yr RTB

★★★★★

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★★★★★

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- Sony 8X DUAL DVD-Rewriter
- Sony Internal Floppy Disk Drive
- 56K Internet Ready Modem
- Luxurious Case With **Screw less** Drive Slots
- Microsoft **Multimedia** Internet Keyboard
- Creative Speakers, Memorex **Optical** Mouse
- Microsoft Office Student and Teacher 2003
- Encarta Encyclopedia Standard 2004



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- AMD Athlon XP 2600+ Processor
- Microsoft **Windows XP** Home Edition
- Mainboard With Integrated 64MB Graphics, 5.1 CH Audio, Ethernet & 6 **USB2.0** Ports
- 256MB USA Crucial DDR333 Fast RAM
- 80GB 7200RPM IDE Hard Drive
- Sony 16X DVD-ROM Drive
- Sony Internal Floppy Disk Drive
- Luxurious Case With **Screw less** Drive Slots
- With **Screw less** Drive Slots
- Memorex **Optical** Mouse
- Ps/2 Enhanced Keyboard
- Creative SBS-250 Speakers

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Add Sony 8X DUAL DVD-Rewriter	£56 exVAT (£65.80 Inc.)
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Add V7 L17PS 17" TFT Flat Panel Monitor	£211.91 exVAT (£249 Inc.)



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Editor's Choice

When we sent out the invitation asking vendors to participate in this group test, we expected the PCs to be a little more tailored to the average student. For instance, out of the nine systems submitted, just two included a printer. Both Evesham and Tiny managed to surpass our expectations and included an all-in-one printer and scanner. At this price that's quite impressive. Of course, it's not the end of the world if you have to buy a budget printer yourself – these days you can get a basic model for as little as £30 – but it would have been good to see a few more included in the £799 limit.

The software bundles were also a little lacking in a few systems. With Microsoft offering such a huge discount for the Student and Teacher Edition of Office 2003, we fully expected almost all the manufacturers to include a copy. As it turned out, only Tiny and Venus included this package, with Microland rather strangely opting for the more expensive Small Business Edition.

Finally, before we reveal the winners, it's interesting to note that for this month's group test there was one feature that every PC had in common, namely an AMD processor. Not a single machine came in with an Intel processor of any description, which must be a little concerning to AMD's bitter rival.

'Not a single machine came in with an Intel processor of any description'

The winners

Out of all the submission this month, there were a few that stood out from the crowd. The **Tiny Student XP3000 VQ** was a solid machine and picks up the first **Highly Commended** award. In terms of performance, it perhaps lacked a little. The Athlon XP 3000+ processor simply didn't have the raw power to match the Athlon 64-based systems in our benchmark tests. Its 3D performance and PCmark 2004 results weren't bad, but it was the Sysmark 2004 score that let it down a little. What really helped this Tiny system was that an HP PSC 1205 multifunction device was included in the price. Without taking up



Evesham Axis 30AS



Tiny Student XP3000 VQ



Demonite Graduate 64

much desk space, this unit would be popular with just about any student and makes the absence of an LCD screen a worthwhile sacrifice. Of course, if you're insistent on never looking at a CRT monitor again, you'll have to give this Tiny offering a miss.

The second **Highly Commended** accolade goes to the **Demonite Graduate 64**. While we decided that raw power wasn't going to be so important when scoring the systems in this group test, you simply can't deny that the Graduate 64 absolutely flew through the benchmark tests compared with the other systems. The Athlon 64 3000+ processor, which was overclocked to 2.3GHz as opposed to the standard 2GHz, was combined with the Geforce FX 5900XT graphics card from Nvidia. Furthermore, the NEC Accusync 17in LCD monitor produced a terrific display and, when you consider this and various other high-quality components, the £799 price tag seems like good value for money.

Out of all the systems this month, one stood out as being a notch above the rest, though, and the **Editor's Choice** has to go to the **Evesham Axis 30AS**. The powerful Athlon 64 processor, 512MB of Ram and ATI Radeon 9600 graphics card all came together to produce a good set of benchmark results. Throughout all the tests it never finished lower than third.

Evesham decided against an expensive LCD screen and instead spent the money on an impressive Canon Smartbase MP30 multifunction device. Whether it's worth losing out on an LCD screen is up to you, but we feel it's a good trade-off. To top it all, Evesham compiled a good selection of software for the Axis 30AS. Along with Intervideo WinDVD 4 and the authoring package Pinnacle Instant CD/DVD, you get Microsoft Works Suite 2004. It might not quite match up to the Office 2003 series, but it provides you with practically everything you'll need in terms of word processing, spreadsheets, email and presentations. All in all, it's a system that's great for students and a worthy winner this month.

Finally, it's worth giving a mention to the ECS EZ-Buddie V7-2. Performance wasn't great, but what impressed us was the 17in LCD-TV screen. For any student this expensive screen would be a real plus point since it not only looks great, but removes the need for a separate TV set – and in cramped halls of residence, saving space in your room is often a priority.

Most Powerful 15.4" N

SPECIALS	HOME PCs	POWER PCs	HOME LAPTOPS	BUSINESS PCs	BUSINESS LAPTOPS
<div> <div> <p>HOME LAPTOPS</p> <p>POWERLITE MS 3.4</p> <p>POWERLITE MS3.4 PRO</p> </div> <div> <p>POPULAR OPTIONS</p> <p>Carry Case</p>  <p>£29.99</p> <p>Starter Pack</p>  <p>4-way surge protector, 5 metre telephone extension lead for Internet, x10 CD-Rs, 500 sheets of paper and USB printer cable</p> <p>£39.99</p> <p>Complete Package</p>  <p>PLUS OK SUITE (9 PACKS)</p> <p>With carry case, printer, external keyboard, external mouse, speech pack, headset microphone and 9 software packs</p> <p>£99</p> <p>Power Package</p>  <p>Everything in package above plus better Lexmark all-in-one (printer, photocopier, scanner) Zoom digital camera, full GT Office Suite (14 packs) and 6 top games</p> <p>£199</p> </div> </div> <div> <p>HOME LAPTOP SPECIAL</p> <p>Tiny PowerLite MS 3.4</p> <p>E-Code: 01142</p> <p>This Tiny Notebook is the most powerful and highest specification notebook you can buy for £1099. But hurry, this special offer deal is only available for a limited period from 9am August 14th to 6pm August 24th.</p>  <p>3.4GHz Intel Pentium 4 Intel Pentium 4 Processor 3.4GHz with HT Technology. The Tiny Mediabook MS 3.4 based on the Intel® Pentium® 4 processor with HT Technology delivers the performance to power your home entertainment. New "Prescott" high performance version with 1024k cache.</p> <p>1024MB DDR RAM Massive 1Gigabyte of high speed DDR RAM increases performance and allows multiple applications to run at the same time – double the size of other notebooks!</p> <p>80GB HARD DISK Massive 80GB hard disk (double that of normal notebooks) provides enormous capacity for large amounts of photos, music albums, videos and other files.</p> <p>128MB ATI 9700 ATI Mobility Radeon 9700 graphics card built-in with dedicated 128MB DDR memory and DirectX 9 support – handles video editing with ease and allows you to play the latest 3D games in style.</p> <p>DVD-Rw MULTIFORMAT Multiformat Panasonic DVD burner drive handles all popular formats. Make your own music, photo or movie CDs or DVDs and copy virtually any DVD or CD for backup purposes. Also acts as a DVD drive allowing you to watch the latest movies.</p> <p>15.4" SCREEN Ultra high definition 15.4" TFT widescreen display with superb brightness, high contrast ratio, and dual display facility.</p> <p>Wi-Fi WIRELESS Built-in 802.11b wireless module and antenna allows you to connect wirelessly to the Internet and other computers in the house or office. Hotspot compatible with hotels, airports, universities, restaurants – access the Internet and your office on the move!</p> <p>4-in-1 CARD READER Multi-format memory/flash card reader and writer with support for SD, SM, MMC and MS memory cards. Use with digital cameras and printers.</p> <p>Massive Connectivity With SVGA-out (projectors), 10/100 ethernet for broadband and networking, Parallel, Infra Red, Audio, Mic. Also includes PCMCIA, Firewire, USB2.0 x 4, TV-out – see opposite.</p> <p>PC-TV PC-TV with media centre & recorder software. Watch and record TV and burn the best shows onto DVD!</p> <p>2.1 Sound System Play music on your notebook on 2.1 speaker system consisting of subwoofer and dual satellites.</p> <p>Audio DJ Play CDs and listen to music without even switching the notebook on!</p> <p>PAY NOTHING UNTIL 2005 No deposit. Pay just CASH price in 6 months when you buy a package deal for just £99 extra</p> <p> <input checked="" type="checkbox"/> Printer <input checked="" type="checkbox"/> Carry Case <input checked="" type="checkbox"/> External Keyboard <input checked="" type="checkbox"/> External Mouse <input checked="" type="checkbox"/> Headset Microphone <input checked="" type="checkbox"/> Speech Pack <input checked="" type="checkbox"/> 9 Extra Software Packs </p> <div> <p>PLUS ADVANCED FEATURES</p> <ul style="list-style-type: none"> Firewire 1394 port for digital camcorders and iPod music players. USB 2.0 x 4 ports for a multitude of devices and peripherals – connect to virtually anything PCMCIA Type II card slot with cardbus for adding Bluetooth, data cards and GPS systems etc. S-Video TV-out connections for full screen presentations or DVD playback 56K Modem including telephone cable for standard Internet and Fax. 12 cell Li-ion long life (normally 2.5 hrs) battery and AC adaptor/charger Ergonomic keyboard, Glide pad and 4 direction scroll. Dimension 358x269x39mm; 3.8Kg </div> <div> <p>PLUS MICROSOFT® SOFTWARE</p> <ul style="list-style-type: none"> Microsoft Office 2003 60 day trial. Microsoft Word, Microsoft Excel, Microsoft Powerpoint, Microsoft Outlook®. Microsoft Works 7 – Six integrated applications for wordprocessing, spreadsheet, graphics, filing, address book, calendar etc. Microsoft Windows XP Home Edition </div> <div> <p>PLUS CYBERLINK POWER SUITE®</p> <ul style="list-style-type: none"> Cyberlink PowerDVD 5 with DivX, the world's no.1 DVD software player. Cyberlink PowerProducer 2 Gold: full-feature authoring package allows you to copy DVDs. Cyberlink Power2Go: powerful and easy to use data burning suite. Create your own CDs and DVDs. Cyberlink Music Match: play back audio music and copy to CDs. </div> <p>(Model N2916)</p> <div> <p>Home Laptop Deal</p> <p>BUY</p> <p>£1099</p> <p>inc vat PLUS DELIVERY†</p> <p>Starts 9am 14th AUGUST Web Orders Only Ends 6pm 24th AUGUST</p> </div> </div>					

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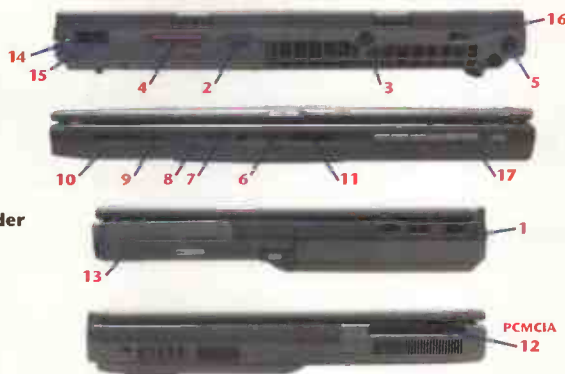
HOME LAPTOP SPECIAL

Ultimate Connectivity

This notebook allows you to connect to all these devices (and much more) with ease.



- 1 USB ports x3
- 2 VGA output
- 3 S-Video connector
- 4 Printer
- 5 Power supply in
- 6 Volume control
- 7 Line-out
- 8 Microphone
- 9 Firewire
- 10 Multiformat card reader
- 11 Infrared
- 12 PCMCIA type II
- 13 DVD/CD Writer
- 14 Network/Broadband
- 15 Modem
- 16 USB x1
- 17 Audio Jack



WHY IS THIS THE FASTEST NOTEBOOK WE HAVE SEEN?

The amazing power of this notebook comes from three key factors:

1 Fast Processor

The Intel Pentium 4 processor 3.4GHz with HT Technology provides more power to run multiple applications efficiently at one time. With fast bus speed, 1024k cache and Hyperthreading technology, this powerful processor can handle the most demanding applications with ease!



2 Superb ATI Mobility Radeon 9700 128MB 8xAGP Graphics (MII)

Your games and presentations will leap off the screen thanks to this high performance graphics engine with 128MB dedicated DDR GRAM and full support for DirectX 9.0. Incorporates ATI Smartshader, Smoothvision and Overdrive technologies.

3 Massive 1024MB DDR RAM

Massive amount of high speed memory (2x 512MB SODIMM modules) provide further boost to performance and allows multitasking.



TINY LAPTOP SPECIAL

12 Reasons why this is The Best Notebook Deal in the UK

1. Powerful Intel Pentium 4 Processor

Intel Pentium 4 processor 3.4GHz with 1024k cache and Hyperthreading Technology (HT). HT enables the processor to execute two threads in parallel – so you can run multiple digital applications at the same time. This is the new "Prescott" core version of the processor.

2. Double RAM Memory

Twice as much memory (1024MB) as other power notebooks that only offer 512MB.

3. Double Hard Disk Space

Massive 80GB Hard disk provides twice as much storage as other notebooks that normally use 40GB – future proof!

4. Double Graphics Power

128MB dedicated memory and 8x AGP ATI Mobility 9700 Radeon Graphics compared with 64MB shared memory graphics in other notebook systems.

The fastest mobile graphics we have seen.

5. Ultra Fast DVD-Burner Speed

High speed and multiformat, Panasonic DVD-Burner allows DVD or CD creation/copying with ease and speed.

6. Superb 15.4" Widescreen Display

Superb 15.4" Widescreen display – ideal for digital content – future proof.

7. Ultimate Connectivity

As well as multiformat card reader, the system has built-in connectivity for virtually everything – see opposite.

8. PC-TV System

Most other notebooks do not include PC-TV. The Tiny Powerlite MS 3.4 includes a PC-TV card with media centre & recorder software. Watch and record TV on your notebook.

9. 2.1 Subwoofer System and Audio DJ

The 2.1 subwoofer system and Audio DJ allow you to use your notebook as a Hi-Fi without even switching it on!

10. Wi-Fi Wireless Built-in

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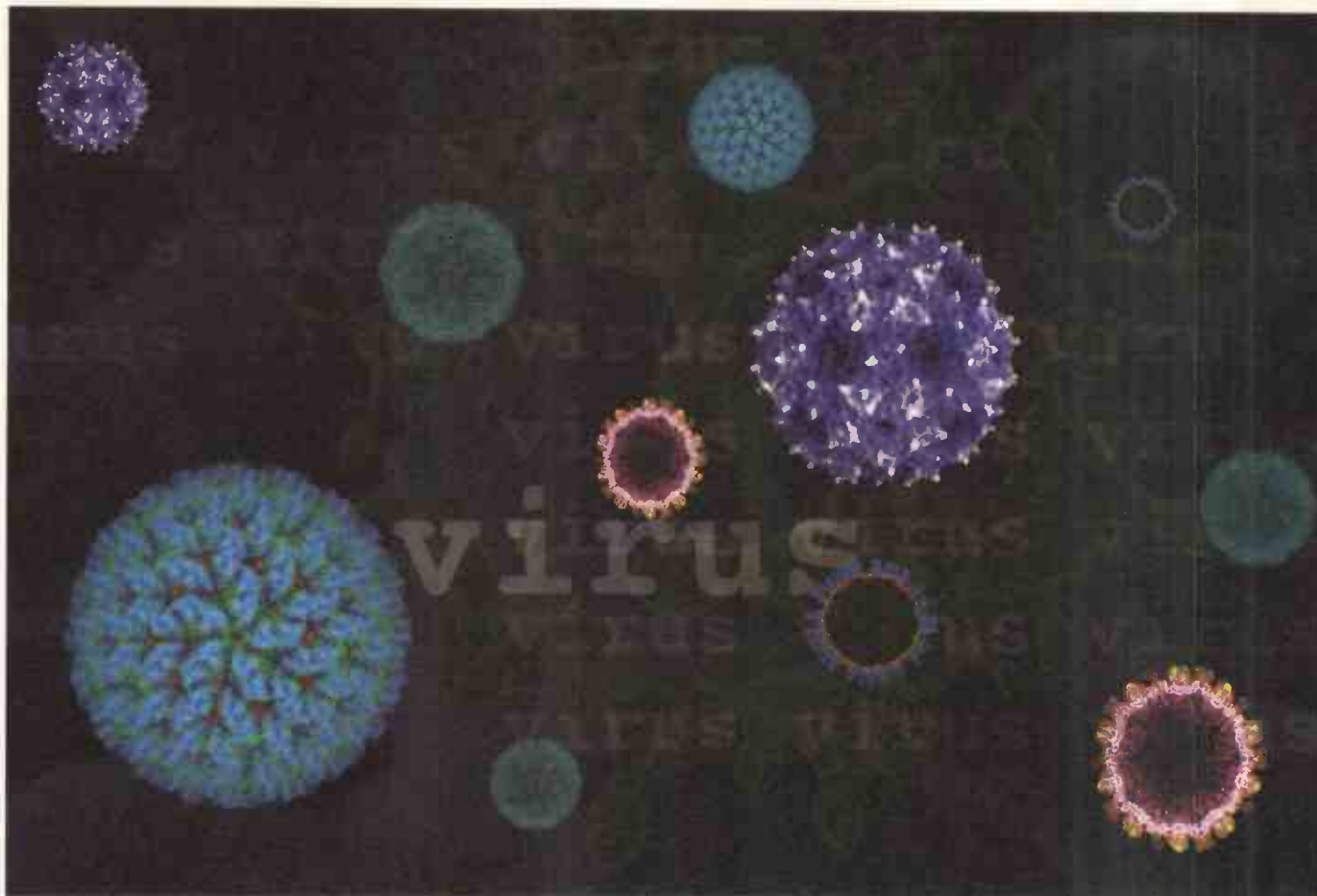
amazon.co.uk
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www.amazon.co.uk

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www.idealinnovations.co.uk





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With computer viruses developing as quickly as the technology to combat them, anti-virus software is essential for every PC. We tested eight packages aimed at home users

Keep it clean

WORDS: RORY REID

In the past, computer viruses were considered nothing more than a nuisance. Today, they are responsible for bringing entire industries to a standstill and even endangering lives. Depending on who you ask, the number of new viruses appearing each month ranges from 300 to 1,000, but whatever the number, the speed at which they travel across the Internet and onto our PCs is startling.

For the average user, becoming infected used to be a rarity. As such, there wasn't a great need for anti-virus software. Today, with more computers connected to the Internet and the increasing availability of information on how to write or acquire viruses, every user is potentially at risk.

Since viruses are a constantly moving target, installing an anti-virus program does not guarantee 100 per cent protection – but what is certain is that without one, your PC will almost definitely get infected sooner rather than later. You also need to use common sense and avoid the temptation to click that official-looking file attachment.

For this test of eight personal anti-virus products, we've scored the scan speed, running costs, features and ease of use – testing the ability to detect current viruses is a cat-and-mouse game and not a particularly meaningful exercise given the rapidity with which new viruses appear. Keep anti-virus updates current, set the scanning options to 'paranoid' and you're as well protected as you can be.





The battle against viruses

The IT industry is locked in a constant battle against virus makers. Anti-virus software is highly sophisticated, but, like the perpetual battle doctors face against new and more deadly human infections, those who wish to provide a cure are usually one step behind every new outbreak.

Unfortunately, as is the case in conventional medicine, a subject must first contract a virus in order for an appropriate treatment or vaccination to be developed. In the world of computers, this usually means a virus must first infect a computer and spread its payload among any connected devices before an appropriate inoculation can be developed.

Once anti-virus software vendors receive a sample of the virus, they can develop what is essentially a vaccine to enable easy diagnosis and (in most cases) treatment of a virus. In the world of computing, these vaccinations are known as signature or definitions files. These are databases of known viruses along with the signature string that uniquely identifies each one.

Anti-virus programs use a variety of techniques in order to detect whether a computer is infected. The most common method is scanning. Anti-virus scanners search through all files on a disk, in memory, and in the computer's boot sector (the place that specifies boot information) for any signature strings contained in the active definitions file.

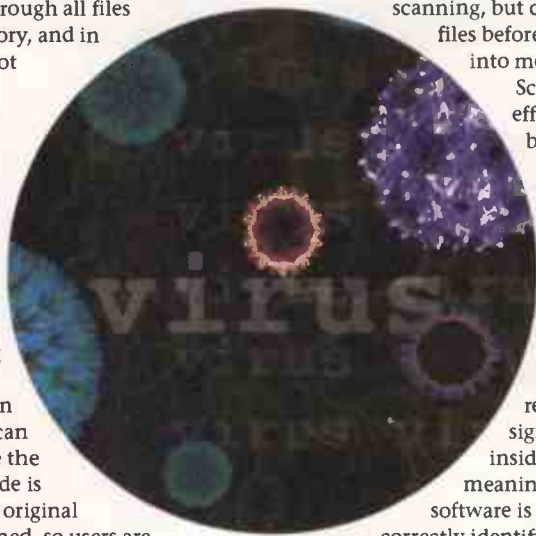
If a matching string is found, that file is identified as being infected and one of three actions can be taken. The file can be repaired (where the offending virus code is removed from the original code); or quarantined, so users are denied access or deleted entirely.

Specifically, on-demand scanning has the advantage of being able to detect viruses that

have not yet been executed. On-access scanning, a more aggressive technique, offers all the benefits of on-demand scanning, but can also scan files before they are loaded into memory.

Scanning is a very effective technique, but can only be relied upon to find viruses that have already been identified in the definitions file. Unfortunately, it doesn't take much for virus creators to rewrite the signature string inside a virus, meaning the anti-virus software is unable to correctly identify the infection.

The fact that these scanning methods are unable to detect brand new viruses that aren't part of the existing definitions



Other malicious software

Viruses are not the only type of malicious software we have to contend with. Other increasingly common threats include adware and spyware. Adware does not infect your computer in the same way as viruses, but its presence on your computer can be incredibly annoying. Its primary function is to display pop-up adverts and redirect you to unwanted websites. In many cases it can change your home page or default search pages, and even redirect you to websites with offensive content.

A more dangerous type of program is spyware. These surreptitiously capture information about you and your computing habits and send the information to third parties. Many well-known programs include spyware as a matter of course, but there are numerous ways in which you can become infected, such as through file-sharing applications, which are typically plagued by unwanted extras.

Clicking the wrong website link or granting permission for an ActiveX control can also lead to infestations, which can be difficult to eliminate without an appropriate spyware/adware removal tool. Many anti-virus programs contain this functionality, but they face the same difficulties in removing and inoculating your PC against these threats as they do with viruses.

New forms of adware and spyware are constantly appearing, the likes of which may not be part of your anti-virus program's database of known threats. As a result, this database must constantly be updated in order to stay abreast of the latest releases. To circumvent this, spyware makers are developing more devious methods of avoiding detection. Many of them now incorporate legitimate code from well-known programs, which acts as a sort of digital camouflage.

In a sense, keeping adware and spyware at bay is a far more difficult task than keeping your PC free of viruses. Fortunately these programs pose a smaller threat, so discovering an infestation on your PC is more of an annoyance than a disaster.

database is a significant threat to the security of your PC.

One method of identifying unknown viruses is heuristic scanning. Over time, anti-virus software makers have developed a set of rules (incorporated in an algorithm) that allow their programs to distinguish harmless software from viruses. If a program acts abnormally, it is tagged as a virus and can be dealt with in a number of ways. This method of scanning theoretically allows for detection of brand new viruses without the need for constant updates, but there are few anti-virus programs that rely entirely on this technique due to its unreliability.

Virus writers are now so advanced that they can create viruses that don't follow traditional rules, which makes identification near impossible. In order to cope with any new rules, new rule definitions must be downloaded, giving them the same disadvantage as traditional scanners. The possibility of false alarms is also greater with heuristic scanning, due to the potential misidentification of a normal, harmless piece of code imitating virus-like behaviour.

Types of virus

If you've been using PCs for a long time, you'll almost certainly have been infected by a virus at one time or another. Viruses have come a long way since the Form virus appeared in the early 1990s, creating bad sectors on floppy disks. More deadly strains now attempt to defeat anti-virus software before infecting a PC.

Because anti-virus software often uses a checksum (the sum of all the bits in a file) to identify threats, virus makers use polymorphic viruses that dynamically alter their checksum every time they infect a new PC, while keeping the dangerous virus code intact.

Tunnelling viruses, another intelligent strain, attempt to load themselves close to the hardware. These can gain access to interrupt handlers and, inevitably, the operating system below the virus scanner. Stealth viruses, meanwhile, load themselves before the anti-virus software, usually in the boot sector of a system or in an early-execution system file.

Other, smarter viruses use all these techniques and more to make life difficult for anti-virus software. One of the most underhanded techniques is for viruses to block access to anti-virus vendors' websites, so a user is unable to retrieve new definition files.



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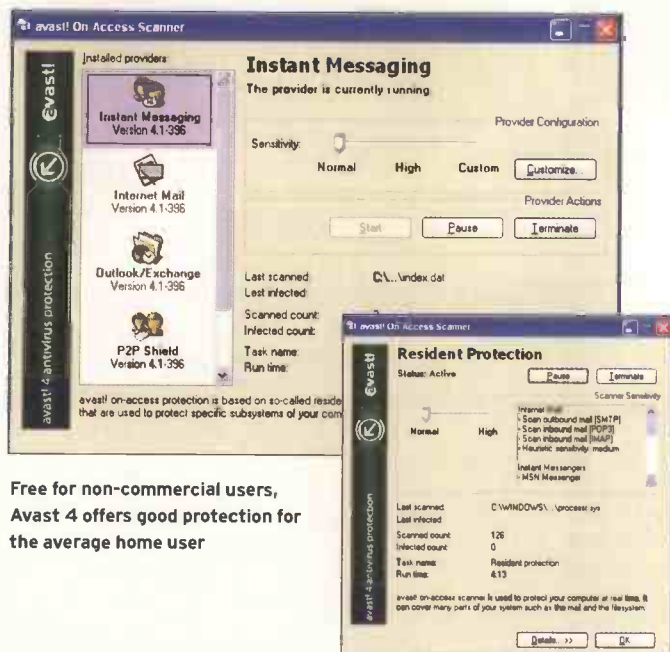
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Free for non-commercial users, Avast 4 offers good protection for the average home user

Avast 4 Home Edition

Avast 4 Home Edition is a free anti-virus package for non-commercial users. Unlike more well-known applications such as Norton, this can be downloaded for personal use from the Avast website, with an activation key supplied via email after registering.

The 7MB setup program won't cause broadband users any problems, but if you're on a 56K dial-up connection a download will take around 18 minutes. Unless you buy the professional version (\$39.95 (£21.98) for a single one-year licence), you can't have the software posted.

The program is very well-featured. It is capable of both standard and heuristic scanning and has a generic scanner for Pop3 email clients.

Our main criticism is the design of the user interface. The program has a 'contemporary' menu system that employs user-definable skins to alter its appearance. Menu buttons aren't labelled, so you'll have to manually hover the cursor over each one before a pop-up box identifies its function, which can be slightly tedious if you just want to get on with things.

Avast was one of the fastest scanners in the group, taking just under a minute to scan our directory of 1,854 infected files. However, the latest update we could obtain was eight days

older than the newest files in our test directory, although Avast claims to issue updates at least twice a week.

There are some useful options you might not expect in a free scanner, including peer-to-peer, instant messaging and Outlook/Exchange virus protection. Although it's free to register for non-commercial use, you need to reregister after 14 months.

This is a comprehensive product, but usability isn't its strong point – there are just too many confusing menus in a variety of styles, giving it a less than professional look and feel. But it does the job and is worth trying out.

DETAILS

RRP Free PRODUCT INFORMATION

Avast
0870 990 5844
www.avast.com

SYSTEM REQUIREMENTS

Windows 95/98/ME/NT4/2000/XP
• 486 class processor or higher •
32MB of Ram • 50MB of free hard disk space

PROS Free; email scanning

CONS User interface

VERDICT

Useful, full-featured application that offers good protection

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



This is a solid solution if you want more protection while you use the Internet

F-Secure Internet Security 2004

F-Secure Internet Security 2004 has arguably the most visually appealing front end of the group. You're unlikely to get confused at first glance as its main menu has only four primary sections. Dig a little deeper, and you'll find it one of the most difficult to navigate.

Performing a scan in AVG Anti-Virus Free Edition requires a single button click, but F-Secure Internet Security requires at least three to perform the same task. It makes relatively little use of graphic icons, which can make finding the right button tedious.

One of the program's most notable features is its ability to limit the number of applications that have access to the Internet. This is useful as it allows you to restrict the use of programs that increase the likelihood of your PC becoming infected by a virus. Peer-to-peer applications such as Kazaa are major culprits in this area, so preventing such programs from downloading unverified software is very useful.

Considering that it's only about £8 more expensive than the basic F-Secure Anti-Virus 2004 package (and uses the same scanning engine), there's little point in not buying this version unless you already have a hardware or software firewall.

Our only real criticism was the program's comparatively slow scanning speed, but this was

offset against very low usage of system resources. You may have to spend minutes waiting for a scan to complete, but you can use your PC simultaneously without a major performance hit.

Getting access to new updates can be expensive. A single licence costs £34.99, which gives you access to new definitions for a year, but the £34.99 renewal cost is nearly three times more than you'd pay to renew Norton Antivirus. This is offset against some of the other benefits it provides, including a personal firewall, so if you're looking for an anti-virus program with a few extra features, F-Secure Internet Security 2004 should fit the bill.

DETAILS

RRP £34.99 (£29.78 ex VAT) BEST PRICE

www.pcw.co.uk/bestprices
PRODUCT INFORMATION
F-Secure 0870 240 8321
www.f-secure.co.uk

SYSTEM REQUIREMENTS

Pentium II class processor or higher •
Windows 98/ME/2000/XP • 128MB of
Ram • 150MB of free hard disk space

PROS Resource use; email scanning

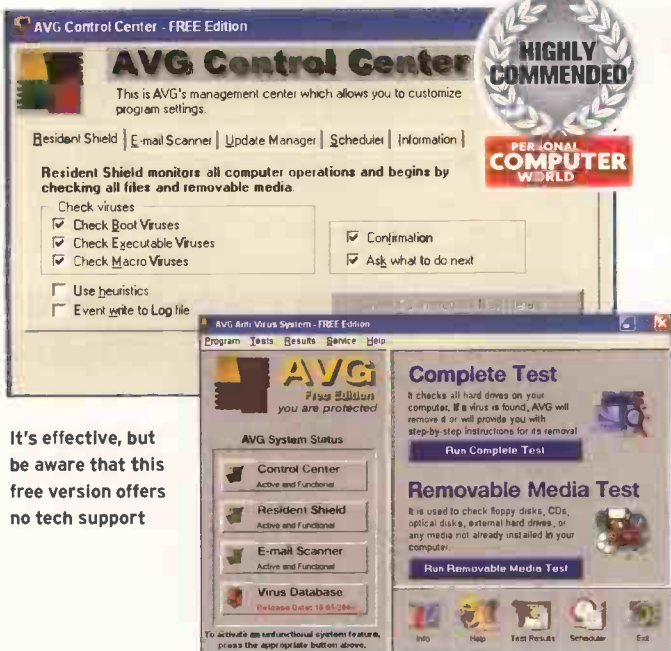
CONS User interface

VERDICT

Pricy for anti-virus abilities, but good for Internet protection

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

Group test >> Anti-virus software



It's effective, but be aware that this free version offers no tech support

Grisoft AVG Free Edition

AVG is one of the most well-known freeware anti-virus applications. It features an on-demand scanner, heuristic testing and an email plug-in. After a painless setup, you are presented with a somewhat basic front end. The full version has an advanced menu that allows more intricate tweaking of the program's settings, but this edition is fairly limited in terms of customisation.

You can perform full system scans on local hard drives and removable media, and create a bootable rescue disk, but there is no allowance for advanced scheduling and creation of your own custom tests. We were also disappointed that the method for manually updating definitions from a local drive is poorly documented. AVG downloads definitions and program updates from the Grisoft FTP site, but if for some reason your Internet connection is unavailable, new signature files obtained by other means (via another PC, for example) need to be copied into the AVG application folder.

When you next start the program, the update is automatically applied.

The email plug-in works only with Outlook/Outlook Express version 5 and above, but it works well. Detected viruses are

automatically quarantined into the Virus Vault – a hidden folder on your hard drive – where you can then either delete files or try to heal them using the Virus Vault window.

It's not the fastest in the group, but it uses a relatively low amount of CPU resources, so you can carry on working in the background.

The full Professional version can be bought direct from Grisoft for \$33 (£18.15).

AVG Free Edition is a solid performer. It may not offer as many bells and whistles as its more expensive rivals, but it is effective enough to keep the average user protected.

DETAILS

RRP Free	★★★★★
PRODUCT INFORMATION	★★★★★
Grisoft	★★★★★
01636 701 832	★★★★★
www.grisoft.com	★★★★★
SYSTEM REQUIREMENTS	★★★★★
Windows 95/98/ME/NT4/2000/XP	★★★★★
• 486 class CPU or higher • 32MB of	★★★★★
Ram • 15MB of free disk space	★★★★★
PROS Effective scanner	★★★★★
CONS Fine-tuning;	★★★★★
no tech support	★★★★★
VERDICT	★★★★★
Ideal for the average home user,	★★★★★
but it lacks technical support	★★★★★
FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



An easy-to-use package that gives more established applications a run for their money

Kaspersky Anti-Virus Personal 5

Founded in 1997, Kaspersky Labs is relatively new in the anti-virus world. It has ascended quickly, though, earning Microsoft's Gold Certified Partner status for security solutions, and supplier to large multinational companies. Kaspersky Anti-Virus Personal 5 is the latest addition to its portfolio, featuring incoming and outgoing mail protection, adware and spyware protection and support for mobile devices such as PDAs.

Kaspersky prides itself on the speed of its definition file releases. The company claims to add new files that defend against the latest threats every three hours. This will, of course, vary depending on the number of new viruses that appear, but in our tests, the program performed well. One benefit of frequent updates is that the file sizes are kept down – the largest we could find was just 1MB.

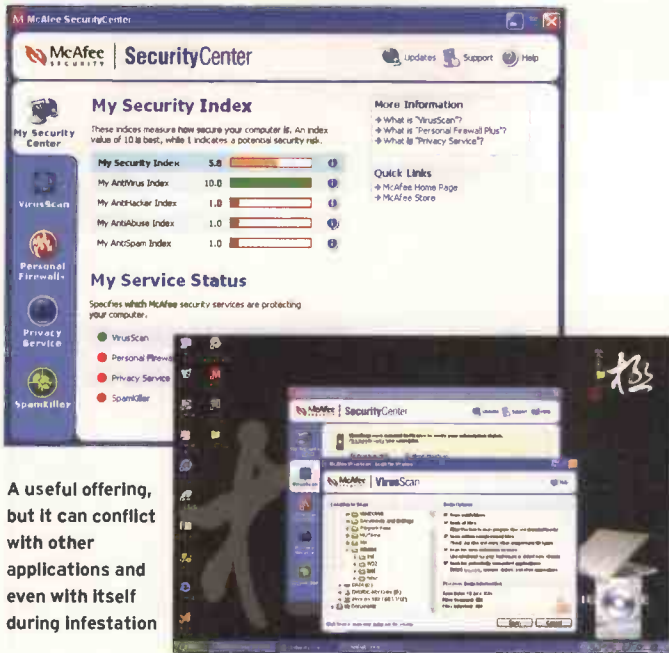
It wasn't the quickest scanner here, but at just over three minutes to scan our test directory, it certainly wasn't the slowest by a long margin.

Keeping it up to speed with the latest viruses in subsequent years will cost you £16.76 a year. This isn't a lot of money, but some users may be put off by the fact that Symantec charges almost £3 less per year for the

more widely known Norton Antivirus. The extra outlay makes sense if you want features such as PDA protection, but users with basic needs may find it excessive. However, Kaspersky has delivered an excellent product. It is easy to use and has most of the functionality you'd expect to find in a modern anti-virus application. It protects email accounts and instant messaging clients, scans against spyware and adware and protects your wireless devices. On the whole, it is intelligent, effective and gives more established applications a run for their money, and wins a Highly Commended award.

DETAILS

RRP £23.95 (£20.21 ex VAT)	★★★★★
BEST PRICE	★★★★★
www.pcw.co.uk/bestprices	★★★★★
PRODUCT INFORMATION	★★★★★
Kaspersky Labs 0870 011 3461	★★★★★
www.kaspersky.com	★★★★★
SYSTEM REQUIREMENTS	★★★★★
Windows 95/98/ME/NT4/2000/XP •	★★★★★
150MHz Pentium or higher • 32MB of	★★★★★
Ram • 50MB of free hard disk space	★★★★★
PROS Ease of use; good scanning	★★★★★
CONS Slower than others	★★★★★
VERDICT	★★★★★
Offers flexibility and protection	★★★★★
from multiple types of attack	★★★★★
FEATURES	★★★★★
PERFORMANCE	★★★★★
VALUE FOR MONEY	★★★★★
OVERALL	★★★★★



A useful offering, but it can conflict with other applications and even with itself during infestation

McAfee Internet Security 6

Along with Norton Antivirus, McAfee's anti-virus range is among the most well-known software of its kind. Internet Security 6 brings with it the promise of excellent virus detection capabilities and, according to a study conducted by the University of Hamburg's Virus Test Center, perfect reliability, meaning no false alarms with heuristic scanning.

Our experience with the product was generally good. It was easy to use, with intuitive menus laid out in a logical way. The program includes functions such as scan scheduling, so you can set it to perform a virus sweep in your absence or at regular intervals. A new feature is anti-spyware technology that detects web diallers and adware.

The suite in fact comprises four separate products integrated into a single user interface. Apart from the virus scanner there's Personal Firewall Plus, Spamkiller and McAfee's Privacy Service. This latter module incorporates a browser pop-up blocker, password management, a file shredder and parental controls. Most of the controls can be configured for multiple users, making this ideal for a family PC. You can also monitor multiple email accounts for spam and viruses.

We also came across some problems with the design of the

software. The main scanning program would frequently clash with the on-access scan reporter in the system tray when dealing with a large number of viruses. It was as if two separate virus scanners were fighting one another for your attention. It would let us know a virus had been found and recommend a full scan, but while this scan was being performed the program constantly told us about more viruses and prompt for another full scan.

On the whole, McAfee Internet Security is a useful and powerful application, but this edition has several issues that reduce its appeal.

DETAILS

RRP £49.98 (£41.23 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Network Associates 020 7949 0107

www.networkassociates.com

SYSTEM REQUIREMENTS

Windows 98/ME/2000/XP • Pentium 100MHz or higher • 32MB of Ram • 71MB of free hard disk space

PROS Interface; flexible options

CONS Conflicts when scanning

VERDICT

Detects many viruses but can conflict with other applications

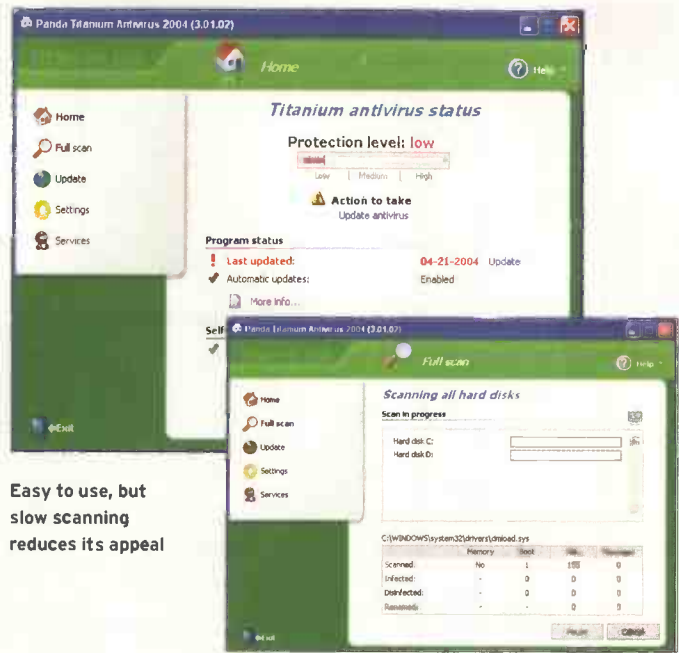
FEATURES

PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★



Easy to use, but slow scanning reduces its appeal

Panda Titanium 2004

Panda claims to be the first anti-virus firm to incorporate automatic installation and updating protection to computers on a network. Titanium Antivirus 2004, features self-diagnosis to help ensure worms do not tamper with or disable anti-virus protection.

One of the company's most bullish claims is the speed at which it updates its virus definitions. Other vendors have been known to wait up to a week to release new updates, but Panda regularly provides new definitions by the day. It is not easy to manually replace definition files, since the software downloads them from the Internet, which could be disastrous if a virus has disabled your connection. We were able to install a manual update but only through an MS-Dos mode command line; inexperienced users may find this daunting.

The interface is refreshingly clean and uncluttered, making Panda's claim of 'install and forget' almost believable. There's also a useful free daily email security bulletin and virus alert service, available both to users and non-users of the software.

Scanning our collection of viruses was tedious. Even when using the most basic options, it took 10 minutes, 31 seconds to complete the task. A full system

scan of a large hard drive would take longer.

Aside from the free products, Titanium Antivirus 2004 is the lowest-priced in the test. For £23.95 you get a range of features including script blocking, instant messaging protection and email scanning compatibility with Microsoft clients. There is also a facility preventing spyware and adware infestation – an increasingly prevalent problem. The cost of keeping the software up to date is £21.39 per year (inc VAT) which isn't high compared to other applications, but Panda doesn't provide a customer loyalty discount, so you'll have to pay full price for following years.

DETAILS

RRP £28.99 (£24.67 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Panda Software 0870 444 5640

www.pandasoftware.com

SYSTEM REQUIREMENTS

Windows 95/98/ME/NT4/2000/XP • Pentium 90MHz or higher • 64MB of Ram • 30MB of free hard disk space

PROS Very easy to use

CONS Slow scanning

VERDICT

Its performance will improve with new definitions

FEATURES

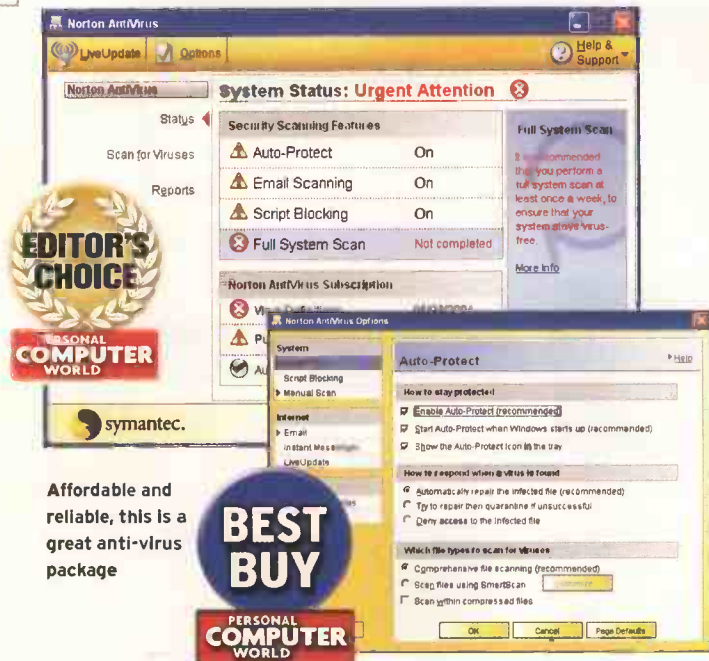
PERFORMANCE

VALUE FOR MONEY

OVERALL

★★★★★
★★★★★
★★★★★
★★★★★

Group test >> Anti-virus software



Affordable and reliable, this is a great anti-virus package

Symantec Norton Antivirus 2004

Norton is one of the most well-known anti-virus vendors in the world and Antivirus 2004, is as well designed as its predecessors. The main menu is clearly laid out, with three main sections that display scanning options, virus reports, or the status of your PC.

The System Status box gives information without being overwhelming. This provides graphical indications of whether automatic protection, email scanning (except for AOL or webmail) and script blocking features are enabled, as well as the state of your definitions files and whether they need updating.

Customising the type of scan you want to perform is easy since most options can be tweaked using logically arranged check boxes. Email and instant messaging options can be configured in the same manner. Once you have the settings you require, the software can be left to operate in the background.

There's no built-in firewall – Symantec sells this as a separate product, or you can buy the Internet Security package that incorporates a firewall, privacy controls and a spam filter for an extra £10.

In our tests, the only drawback was that it took eight and a half minutes to complete, with some fairly heavy CPU usage, so you may want to implement the

scheduling facility to run the program at times when you are unlikely to be using your PC.

Other useful features include anti-spyware protection and scanning against key-logging programs that try to record your keyboard inputs. Instant messaging virus protection is also incorporated.

Keeping Antivirus 2004 up to date is not expensive: a year's subscription costs £13.81, making this more affordable than many of its rivals. Coupled with the fact that it outperformed every other product in the group, this makes Norton Antivirus 2004 the recipient of our Editor's Choice award.

DETAILS

RRP £34.99 (£29.78 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Symantec 0800 389 7030

www.symantec.com

SYSTEM REQUIREMENTS

Windows 98/ME/2000/XP • Pentium

150MHz or higher • 32MB of Ram •

125MB of free hard disk space

PROS Thorough; easy to operate and configure

CONS Slow scanning

VERDICT

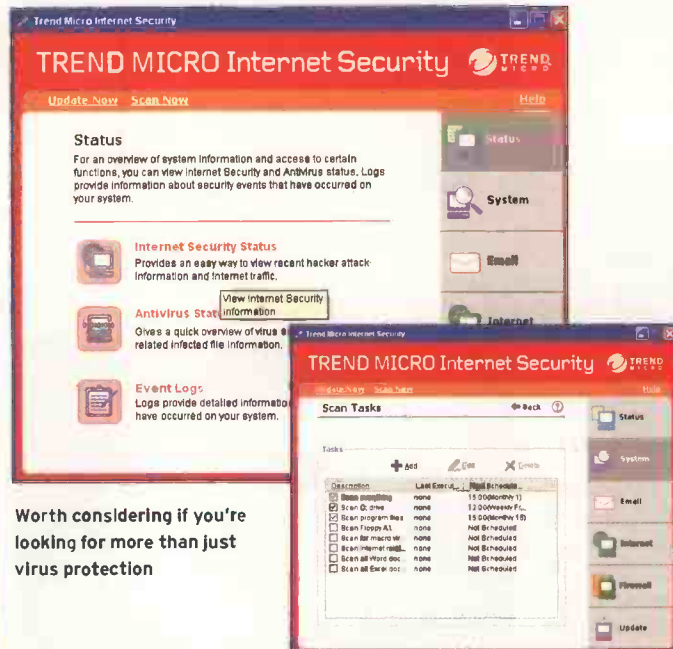
Outstanding results and value

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



Worth considering if you're looking for more than just virus protection

PC-Cillin Internet Security 11

PC-Cillin is one of the longest serving anti-virus programs on the market. Along with normal and heuristic virus scanners, Version 11 features spyware scanning and privacy protection, as well as anti-spam filtering. As a result, it is more expensive than dedicated anti-virus products.

It's got a very fast scanner, as we discovered when scanning our test directory containing 1,854 infected files. Using the default 'scan all files' option it only took 45 seconds and put little strain on system resources. Using the most advanced security settings, including six-layer archive checking required an extra 25 seconds of scanning time, which is still much faster than most of its rivals.

To its credit, Internet Security 11 is user friendly. It is logically arranged into five main sections, the first of which is the status menu: this lets you view any history of hacker attacks, including the source IP address, destination port and type of attack. The rest of the interface is as informative as it is intuitive, with easy access to controls for virus checking in email services such as MSN and Yahoo.

The program has an Outbreak Alert feature that acts as an early-warning system for viruses. This lets you know if a virus is

spreading rapidly or otherwise posing a threat to your PC. It will also prompt you to update the software to ensure protection. PC-Cillin also includes a personal firewall, which reduces the chances of your computer being susceptible to hackers and makes it more difficult for worms to gain access.

Its versatility and extra features will appeal to new PC owners without an existing firewall, so if you're looking for more than just virus protection, PC-Cillin Internet Security 11 is worth considering. But for more advanced users, it doesn't prove as powerful as other programs in the group.

DETAILS

RRP £39.95 (£34 ex VAT)

BEST PRICE

www.pcw.co.uk/bestprices

PRODUCT INFORMATION

Trend Micro 01628 400 500

www.trendmicro.com

SYSTEM REQUIREMENTS

Windows 98/ME/NT4/2000/XP •

Pentium 166MHz or higher • 32MB of

Ram • 25MB of free hard disk space

PROS Interface; flexible options

CONS Poor scanning performance

VERDICT

Good if you want to keep your PC safe from more than viruses

FEATURES ★★★★★

PERFORMANCE ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★



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Tiny.com has become the UK's leading on-line PC Company by delivering the latest PC technology at amazingly low prices. We asked Tiny.com R&D Manager, Salim Hasan, how he keeps up-to-date with the latest technology.



Tiny.COM Evaluations Department



SALIM HASAN
Tiny.COM R&D Manager

Q. How big is your department?

SH: We have 18 engineers dedicated to new product development and evaluation in the UK and we also have staff in France and Hong Kong. There are three key

areas within the department; software development and compatibility testing; chassis and case design; and component selection.

Q. What are the main responsibilities of the Evaluations department?

SH: The main areas of work are to monitor emerging technologies from key industry leaders such as Intel, AMD, ATI, NVIDIA, VIA and Microsoft and incorporate them into an affordable practical solution. In addition to product design and component evaluation, our labs are authorised testing centres for major suppliers such as Microsoft.

Q. How does Tiny.COM get the latest technologies to market quicker than other major PC suppliers?

SH: Industry leaders like to work closely with Tiny.COM because we are in the unique position of having the internal resources and buying power of a large supplier, but with the flexibility of a smaller supplier. We can test and launch the latest technologies and get them to our customers quicker than other PC suppliers.

Q. What new products are coming within mainstream PCs in the near future?

SH: In terms of PC performance the biggest areas over the next few months are PCI Express Graphics bus and new Intel chipsets that maximize the potential of Intel's new "Prescott" core Pentium 4 Processors.

"We can test and launch the latest technologies and get them to our customers quicker than other PC suppliers"

In terms of mobility, we have seen demand for large screen notebooks and will shortly be introducing a larger range of wide screen 17" and 15.4" high performance desktop replacement ranges.

In multimedia terms, we see a higher percentage of systems incorporating digital tuners and double layer DVD technology.

Q. Several years ago Tiny systems were not renowned for high specifications, what has changed now?

SH: At that time Tiny was owned and run by OT Computers Ltd who went into administration. Tiny was bought by our Group and the new Tiny.COM is a completely new company. Our PCs are completely different and over the past few months alone we have won 17 Best Buy, Value and Editor's Choice Awards.

Q. How can Tiny.COM provide high spec leading technology systems at low prices?

SH: The business model used by Tiny.COM is to keep overheads and unnecessary costs to a minimum. We don't advertise on TV and we don't have retail stores (even though some of our PCs can be ordered via The Computer Shop stores). This way, we can use the money we save to provide much higher specification systems at the UK's lowest prices.

Q. What new areas will Tiny look at in the future?

SH: We are seeing high levels of interest in Linux and are looking at introducing a wider range of Linux based PC systems and Notebooks.

Tiny.COM see the Home Cinema market eventually merging with PC technology and have we are developing a complete range of Home Cinema products and Media Centres which will be launched in the next few months.

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Athlon 64-3200+, 1024 MB, 200GB, 256MB ATI Radeon, PC-TV, 8x DVD-Rw/CD-Rw, 16x DVD, 10 in 1 CR, 15" TFT, 2.1 Subwoofer system



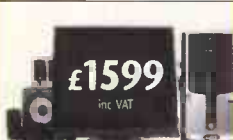
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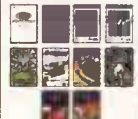
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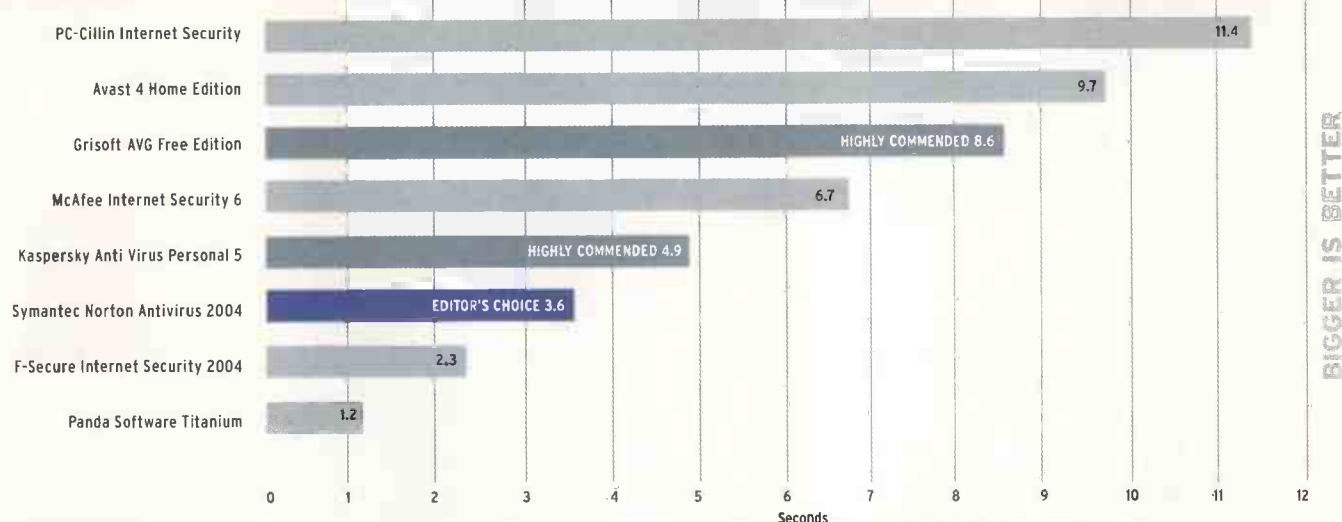
All Offers End 31st August



Lab results



Number of files scanned per second



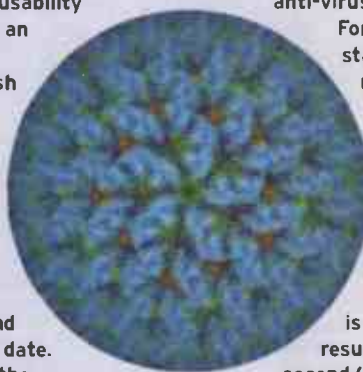
How we tested

We deliberately didn't attempt to measure the effectiveness of virus detection in these products, as in our view usability and scanning efficiency of the product is more of an issue for users – there's nothing more annoying than having to sit around for hours with a sluggish PC while a full disk scan takes place.

With the intense competition between software vendors and the potential damage to their reputations if the software can't detect known virus threats, you can pretty much take it as read that they will all trap existing known viruses. The ability to protect against new unknown viruses is very much a function of how speedily a vendor can respond with an update, and how diligent you are in keeping the product up to date. For this reason we made no attempt to measure the accuracy of virus detection – comprehensive tests on viruses are

done on a regular basis by organisations such as ICSA (see box below) as part of ongoing certification programs in which all the anti-virus software companies in this group test participate.

For our tests we measured the time taken to scan a standard directory containing 1,854 infected files – a mixture of viruses, trojans and other malicious files such as diallers supplied to us by email security specialist Messagelabs (www.messagelabs.com). Each anti-virus program has different default settings for file scans, so each scanned varying numbers of files. Some only scan executables, others may scan all files – the logic being that if a file isn't executable it's technically not a threat. We tested with the 'out of the box' settings as this is generally how they will be first used. From these results we calculated the number of files scanned per second (see graph above). Our testbed system was a Dell Dimension 8200 with a 2GHz P4 CPU and 256MB of Ram.



A brief history of virus detection

It's often forgotten that the first virus discovered 'in the wild' (that is, affecting normal users' systems) was an Apple II virus called Elk Cloner that appeared in 1981. However, it wasn't until the late 1980s that viruses started to become a real problem for PCs. Viruses such as (c)Brain, Jerusalem and Stoned (which are still around today) prompted a growth in companies making anti-virus software. In 1990, products were launched by Symantec, Central Point and a host of other smaller names to combat the perceived threat.

Of course, as soon as this happened, the marketing departments of the big vendors swung into action, claiming to offer the best solution. Independent verification of the claims was a problem as few people had access to the complete library of existing viruses (about 200 or so in 1990, but rapidly increasingly to over 1,000 a year later). And even if they did, there was heated debate about whether an anti-virus product needed to accurately identify a particular virus, or whether it was sufficient to detect that there was something wrong with the file.

For several years there was a lot of confusion for consumers. Anti-virus companies would jealously guard their libraries of known viruses, hoping to gain an edge in detection over their rivals. This made it almost impossible to get virus samples for testing, and, on the odd occasion that they were successful, the results were immediately denounced as being partial to whichever company supplied the viruses.

In the wake of this unsatisfactory situation, in 1993 anti-virus researcher Joe Wells decided to compile a list of viruses collected from real infection reports, and enlisted the help of other researchers to verify his list. Thus the 'Wildlist' was born (www.wildlist.org). It's viewed as the most authoritative virus listing in the world and is used by organisations such as Trusecure's ICSA Labs (www.iscalabs.com) which, among other things, independently certifies anti-virus products based on its ongoing detection of viruses in the latest Wildlist.

The Wildlist is available on the website and it only includes those viruses that have been verified by the worldwide network of over 70 Wildlist participants as being in general circulation.

Table of features

For the best anti-virus prices go to www.pcw.co.uk/bestprices

				
MANUFACTURER	AVAST	F-SECURE	GRISOFT	KASPERSKY LABS
PRODUCT	4 HOME EDITION	INTERNET SECURITY 2004	AVG FREE EDITION	ANTI-VIRUS PERSONAL 5
Price inc VAT (ex VAT)	Free	£34.99 (£29.78)	Free	£23.95 (£20.21)
Telephone	0870 990 5844	0870 240 8321	01636 701 832	0870 011 3461
URL	www.avast.com	www.f-secure.co.uk	www.grisoft.com	www.kaspersky.com
PLATFORM/COMMUNICATIONS SUPPORT				
Windows 95/98/ME/NT4/2000/XP	✓/✓/✓/✓/✓/✓	X/✓/✓/✓/✓/✓	✓/✓/✓/✓/✓/✓	✓/✓/✓/✓/✓/✓
Pop3/SMTP	✓/✓	✓/✓	✓/✓	✓/✓
Outlook Express	X	X	✓	✓
Instant messaging	X	X	X	✓
SCANNING/ OTHER				
Heuristic scanning	✓	✓	✓	✓
On-demand/on-access scanning	✓/✓	✓/✓	✓/✓	✓/✓
Scheduling/script blocking	X/X	✓/✓	✓/✓	✓/✓
Spyware/adware scanning	X	✓	X	✓
Incremental update	✓	✓	✓	✓
Renewal price	Free	\$48.95 (£26.95)	Free	£16.76
Misc	Skins support	Application control; firewall	N/A	PDA support
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall score	★★★★★	★★★★★	★★★★★	★★★★★

				
MANUFACTURER	MCAFFEE	PANDA	SYMANTEC	TREND MICRO
PRODUCT	INTERNET SECURITY 6	TITANIUM 2004	NORTON ANTIVIRUS 2004	PC-CILLIN INTERNET SECURITY 11
Price inc VAT (ex VAT)	£49.98 (£41.23)	£28.99 (£24.67)	£34.99 (£29.78)	£39.95 (£34)
Telephone	020 7949 0107	0870 444 5640	0800 389 7030	01628 400 500
URL	www.networkassociates.com	www.pandasoftware.com	www.symantec.com	www.trendmicro.com
PLATFORM/COMMUNICATIONS SUPPORT				
Windows 95/98/ME/NT4/2000/XP	X/✓/✓/✓/✓/✓	✓/✓/✓/✓/✓/✓	X/✓/✓/✓/✓/✓	X/✓/✓/✓/✓/✓
Pop3/SMTP	✓/✓	✓/✓	✓/✓	✓/✓
Outlook Express	✓	✓	✓	✓
Instant messaging	✓	✓	✓	✓
SCANNING/OTHER				
Heuristic scanning	✓	✓	✓	✓
On-demand/on-access scanning	✓/✓	✓/✓	✓/✓	✓/✓
Scheduling	✓	✓	✓	✓
Script blocking	✓	✓	✓	✓
Spyware/adware scanning	✓	✓	✓	✓
Incremental update	✓	✓	✓	✓
Renewal price	£24.99	£21.39	£13.81	£19.95
Misc	Content filter; ad blocker	Firewall	N/A	ActiveX/Java blocking
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall score	★★★★★	★★★★★	★★★★★	★★★★★

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- Customise and listen to your favourite music with BT Yahoo Broadband's Internet radio service and choose from the largest collection of free videos on the web.

Editor's Choice

After June's look at corporate anti-virus software, we thought it was important to see what sort of protection is available to the ordinary home user. We saw a good range of offerings, including dedicated scan and repair packages and more complex Internet security suites.

The regularity of virus definition updates is important for any product, as is the speed of response to new threats. Most of the software here offers daily or even hourly updates, but that's of little use if you've disabled automatic updating. It's very much a case of pot luck if you happen to be one of the first to be infected by a new virus, but once a threat has been identified you should be safe if your updates are current. All the products here have admirable track records of new updates – even the free packages. Whereas one company may have the most

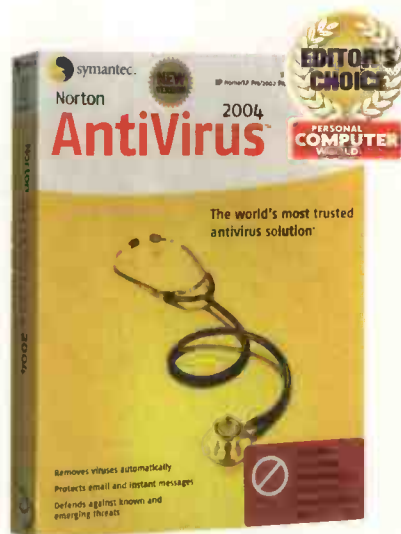
'For keeping your PC free of viruses, Norton is the best choice'

recent virus signatures on one occasion, there is no guarantee of that being the case on another.

Our tests put particular emphasis on usability and scanning speed, but it's worth pointing out the merits of having software that also protects against other Internet threats. If you have children who use peer-to-peer file-sharing applications, you're probably also aware of the potentially dangerous content that can be downloaded. Panda's Titanium Antivirus 2004 and F-Secure both offer advanced features, such as the ability to stop individual applications from connecting to the Internet. These products also act as a firewall, which increases your level of protection against the threat of hackers, worms, and so on.

The winners

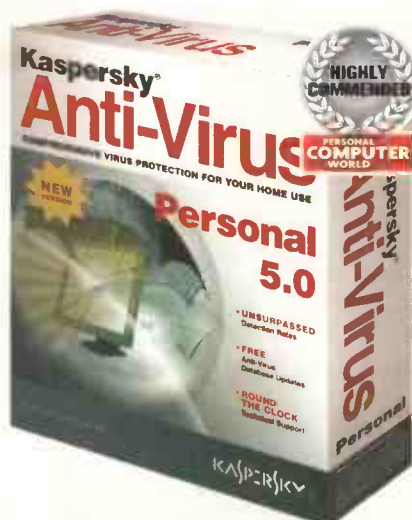
Our first **Highly Commended** award goes to **Grisoft's AVG Free Edition**. There is much to be said for the fact that it can be downloaded free and has no annual renewal charge. It's a fairly basic package compared to some of the paid-for products here, but it's competent and tries to keep things as simple as possible, a sentiment we applaud. The software provides a good level of



Symantec Norton Antivirus 2004



Grisoft AVG Free Edition



Kaspersky Labs Anti Virus Personal 5

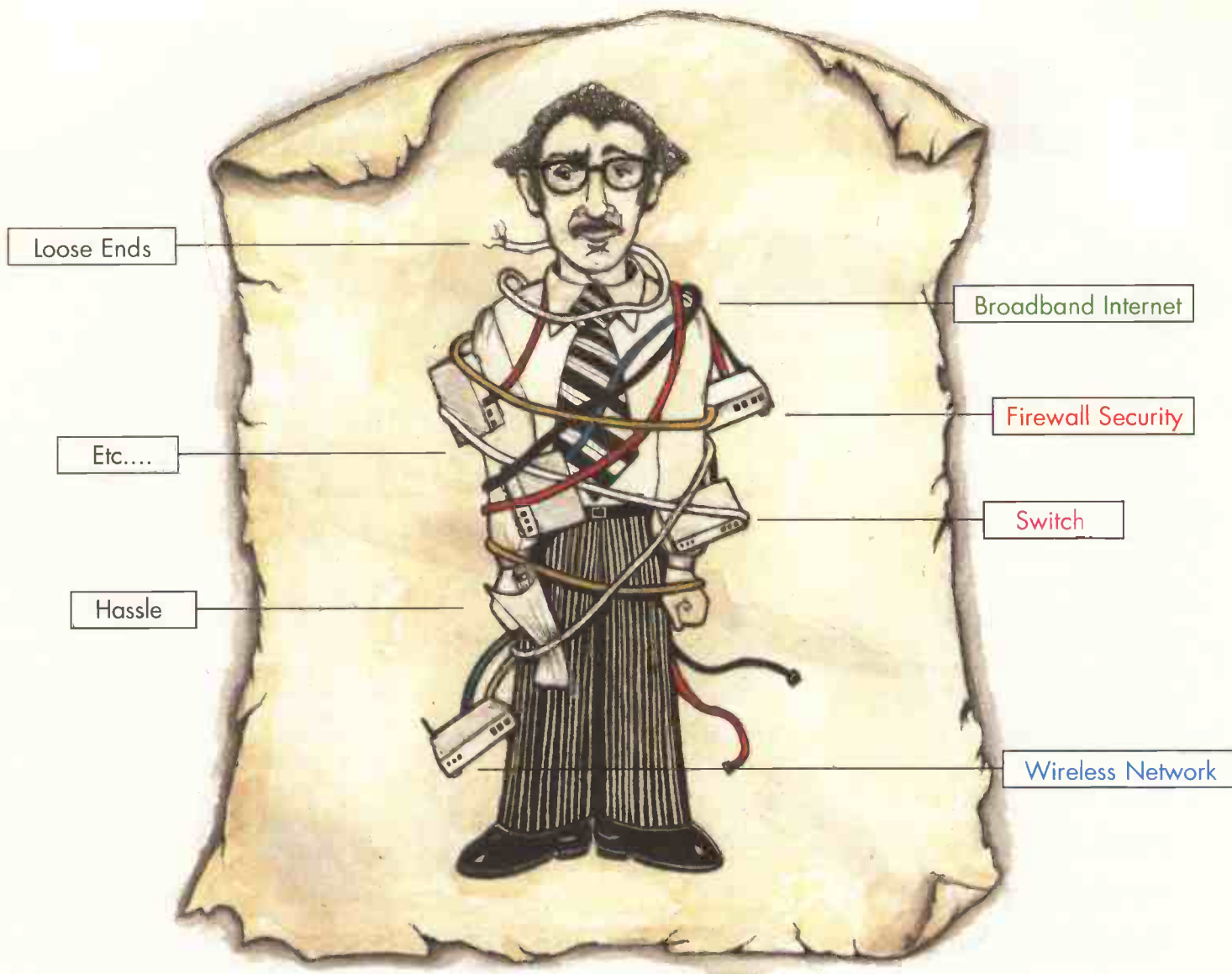
protection against the most common types of viruses ordinary users are likely to encounter.

AVG Free Edition has a very basic menu system that offers a minimum of options. You can configure the types of files you want to scan and the method in which you do this, but advanced features such as spyware or adware removal and protection from viruses that spread via instant messaging clients aren't available. AVG makes no claims that its package is a catch-all suite, and in our opinion it's all the better for it. If you want a good, fast, reliable virus scanner it's one of the best. And if you want the comfort of technical support and more advanced features, the commercial version doesn't cost an arm or a leg.

Our second **Highly Commended** award goes to **Kaspersky Labs Anti Virus Personal 5**. This low-cost package incorporates many features you'd expect to find in a complete Internet security package. As well as on-demand, on-access and heuristic scanning, there's a personal firewall and mail protection options, and it will even keep your PDA free from viruses. With Kaspersky's three-hourly updates, the likelihood of it missing a new outbreak is greatly reduced, plus there's the benefit that individual updates don't have to be massive.

Our **Editor's Choice** award goes to **Symantec Norton Antivirus 2004**. Symantec has put together an excellent list of features in this software, which incorporates protection against common non-virus threats such as keystroke loggers and spyware, plus good protection against more specific threats such as rogue scripts and worms. Email protection is good, although our only complaint is the lack of specific protection for webmail accounts. AOL users aren't catered for, either. But apart from these caveats, we were impressed with the product's capabilities. Norton Antivirus 2004 is also very easy to use. All its menus are clearly laid out, despite the sophistication of what goes on behind the scenes, all options are easy to apply, and there is comprehensive online help and technical support available.

Norton also provides the best value for money of all the dedicated anti-virus software in the group. It initially costs £34.99 to buy, which is more than F-Secure Internet Security 2004, but F-Secure's yearly renewal is \$48.95 (£26.95), and updating Norton costs just £13.81 per year. If you want supreme control of your Internet security and settings, F-Secure has a definite advantage, but for keeping your PC free of viruses, Norton is the best choice.



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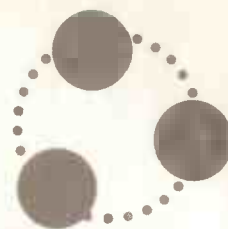
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WRITTEN BY ALAN STEVENS

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Nokia revamp

Nokia plans to introduce two new smartphones, a range of business accessories and network security products in an attempt to make its enterprise solutions division profitable by the end of 2005. It also launched Secure Access System 2, a new version of its SSL IP VPN remote access product, to introduce new configuration replication and single sign-on tools.

www.pcw.co.uk/News/1155884

Sun powers up new pay-per-use model

Sun has developed a metered pay-per-use model for network storage. Initially aimed at high-end data centres, Sun plans similar services for low and mid-range storage systems based on Sun's Storedge Power Units, which include hardware, software and other services, support and licences.

www.pcw.co.uk/News/1155855

Telcos push line convergence

A group of global telcos has teamed up to develop next-generation voice services to cut corporate call costs by routing traffic between fixed-line and mobile infrastructures. The Fixed-to-Mobile Convergence Alliance believes it can start the convergence of mobile and fixed-line services, giving cheaper calls.

www.pcw.co.uk/News/1155878

This month, we road test multimode wireless access points and review a server, switch and network management tool

HP introduces new network portfolio

HP's Procurve networking arm has released a series of new products for wired and wireless networks.

The additions to the Procurve portfolio include improved control software, gigabit switches, with accompanying modules, as well as Wifi access points and antennas.

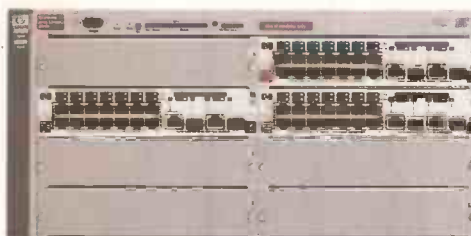
The products are largely aimed at reinforcing HP's Edge strategy – pushing network functions away from a central core processor towards the edge of the network.

'What we are creating is something very different to what's on the market from Cisco,' said HP's Procurve business manager Jon Wetherall.

HP's Procurve Manager and Manager Plus network control software has also been upgraded.

Better access point management has been added, along with email and SMS alerts about problems for administrators, and data sampling software that can be

The Procurve 5308 switch is part of HP's new network range



used to monitor performance.

Software updates have been made to the Secure Access 700wl module to

make security configuration easier, and the company's 9300m series of switches has had IP security upgraded.

A 16-port gigabit switch expands the existing range, with two add-on modules giving 28- or 48-port extensions.

Power over Ethernet (PoE) has been added, with an external power supply to give 15.4w per port, in line with the 802.3AF PoE standard.

HP also released six new Wifi antennas for the 420 and 520WL wireless access points, with a mixture of internal and external, omnidirectional or directional antennas. An 11-channel

radio card has been added to the 520WL range.

According to HP, the latest addition to its blade server family, the Proliant BL30p (see www.pcw.co.uk/News/1155829), is its densest ever two-way processor blade server. It is available with the AMD Opteron and Intel Itanium chipsets.

Priced from £1,290, the server is aimed at customers who are looking to consolidate a distributed server system of towers or racks, not only on the hardware side, but in order to run more applications per server.

Iain Thomson

Nortel raises awareness of SIP

Nortel is pushing for enterprises to adopt the Session Initiation Protocol (SIP).

The protocol sets up communication sessions using a choice of technologies, with the choice for the medium depending on their availability. Technologies that can support SIP include Internet telephones, mobile phones, instant messaging and video messaging.

SIP also allows for presence awareness, informing an employee who is seeking to contact a co-worker if they are available, travelling, on the phone or in a meeting.

Nortel currently offers several products supporting SIP, including its Multimedia Communication Servers and a SIP Multimedia client that runs on a desktop computer through a web browser, or on a PDA.

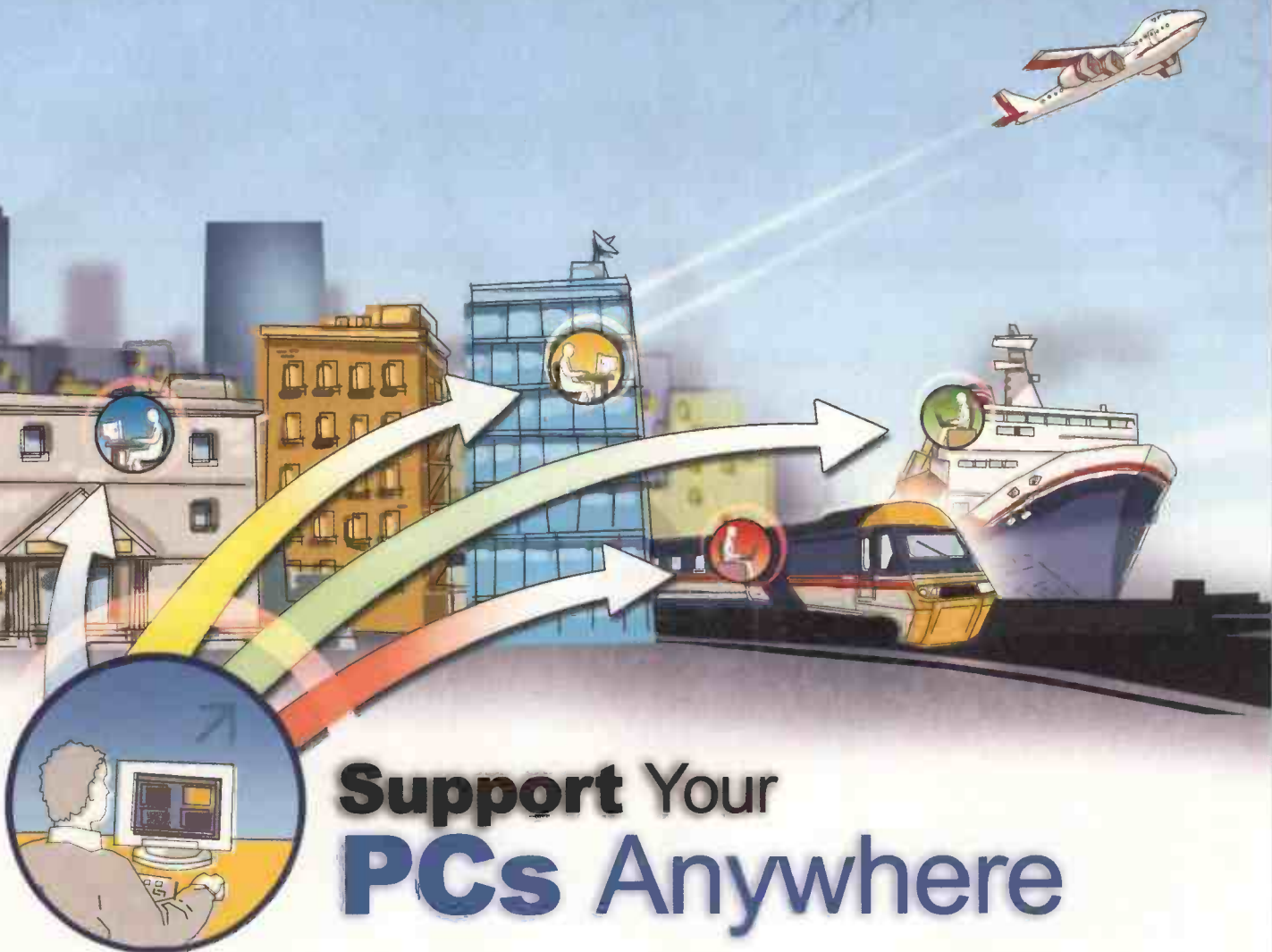
Within a year, the company plans to add SIP support to its full line of Communication Servers, as well as IP devices such as phones and conferencing appliances.

'We are seeking hyper-interactivity,' said Peter Finter, Nortel's head of enterprise solutions for EMEA.

Nortel is also pushing the protocol with its Preferred Software Membership programme, which launched in early June. This lets users upgrade their software to the latest version at a fixed rate. By giving them easy access to the latest features, Nortel is betting that users will automatically start using them.

This way, Finter hopes to deal with the lack of awareness that is holding back SIP. He also sees Internet telephony as a key technology in next-generation networks.

Tom Sanders



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VOIP transforms the telecoms trade

Services such as Skype are leading the VOIP revolution, but Alan Stevens worries how the big phone operators will react

'Skype uniquely combines VOIP with peer-to-peer networking technology'

BT has announced ambitious plans to convert its entire PSTN network to an IP-based infrastructure (see page 20). Dubbed the 21st Century Network (21CN), trials start in October and, said BT, the whole network will be IP-based by 2009, making it the most radical switchover anywhere in the world (see www.pcw.co.uk/News/1155765).

A major reason for this move is to cut costs. The use of voice over IP (VOIP) technology will enable BT to save around £1b per year on exchange hardware and staff. However, time is not on BT's side, as a number of rival public VOIP services are already popping up to take advantage of the spread of broadband. Among them is Skype, which combines VOIP with the peer-to-peer (P2P) networking technology popularised by file-sharing services such as Napster.

Services that let you make calls using IP and the Internet have been around for a while, but Skype stands out for several reasons. It's easy to use and, at the moment, free. All you have to do is download the software and register as a subscriber. You can then make and receive voice calls from your PC and even make conference calls. All calls are encrypted for privacy, and a global directory makes it easy to locate and contact other subscribers.

Another distinguishing factor is call quality, which is incredibly high. Also, you don't need an

expensive VOIP handset, just a microphone, speakers, cheap headset or USB phone. There's even a version for use on Pocket PC. And although always-on broadband makes it easier to receive incoming calls, it's not essential. Voice doesn't use much bandwidth and, even on dial-up and low-bandwidth wireless connections, Skype's software means you'd never know you were using IP.

Lastly, because it uses the same peer-to-peer networking technology as music-sharing services, Skype is able to work across most firewalls and gateways employing Network Address Translation (Nat). That's an important advantage, since most Internet users are located behind such defences, and this can cause real headaches when deploying more conventional VOIP products.

With over 14 million downloads to date, Skype's software is proving highly popular, and not just with home users wanting to call relatives abroad. Companies are using Skype to connect branch offices and to communicate with remote and mobile workers without racking up huge phone bills.

The only cloud on the horizon is likely to be the reaction of the big phone operators. As BT's 21CN announcement shows, all the telecoms companies are looking to increase their investment in IP, and threats to their monopolies from services like Skype are unlikely to be viewed in a favourable light. www.skype.com

Seagate makes move with new disks

Hard disk maker Seagate Technology has released a range of drives to meet business demands for faster access to more data storage space on servers, desktop and notebook PCs and handheld devices.

Analysts estimate the global market for disk drives will grow from 261 million units shipped in 2003 to 380 million in 2006.

Seagate's NL35 series is a Fibre Channel component providing 500GB (0.5TB) of data storage.

It is designed for enterprise storage area networks (Sans) and data centres where high capacity and performance,

virtual storage management and disk/tape-based backup/recovery applications are key.

'Data centres face a growing set of challenges, including satisfying bulk storage requirements, simplifying data management, meeting service levels of high I/O transaction processing applications, managing within existing space constraints and minimising data centre cost per square foot,' said Dave Reinsel, programme director of storage research at IDC.

The Cheetah 15K.4 has a spin speed of 15,000rpm

Aimed at desktop PCs and local area network (Lan) servers, the Cheetah 15K.4 focuses on fast data access and reliability with a spin speed of 15,000rpm and quoted mean time between failure rating of 1.4m hours, with three capacity options of 73, 147 and 300GB.



It will initially be offered with Fibre Channel or Ultra320 SCSI interfaces, with a faster serial attached SCSI (SAS) device offering 3Gbits/sec data transfer speeds following before the end of the year.

Roaming workers should start to see notebook manufacturers integrating the two-disk 100GB Momentus 5400.2 into systems, while the Momentus 7200.1 is Seagate's first portable drive with a 7,200rpm spin speed.

Seagate has also upgraded its external hard disk to provide 400GB capacity.

www.seagate.com

Martin Courtney

NETWORK SERVER

NEC Express 5800 TM700

A well-built device with specs and a price to suit a small business



For those of you tempted to press an old desktop PC into use as a file server it's worth looking at some of the alternatives first. In particular, many low-cost entry-level servers currently available are designed with the small business in mind. This includes the NEC Express 5800 TM700, which, despite its desktop-like price, is a remarkably well-specified and capable solution.

You can buy a TM700 server for as little as £499 ex VAT and still get quite a decent specification. For that money the processor will be a 2.8GHz Pentium 4 with 512MB of ECC memory and an 80GB Serial ATA (Sata) hard disk. This isn't particularly exciting, admittedly, but good enough for file and print sharing duties and, if you need them, faster processors, additional

memory and extra disks can all be specified.

The server we tested, for example, had the same 2.8GHz P4 chip but with 1MB of cache compared to 512KB on the base system. It also had a second 80GB disk fitted. All of which bumps up the price with a pre-install of Windows Server 2003 pushing it further still, although the review system still managed to dip under the £1,000 barrier – just.

The two drives also came configured as a mirrored pair (Raid 1), where data on one disk is automatically replicated on the other. If one disk fails the other can still carry on, although you only get half the theoretical capacity as a result. Alternatively it's possible to use the full capacity of the two disks by specifying a Raid 0 configuration using the Bios-resident **setup** utility provided.

Priced the same as a desktop PC, the Express 5800 TM700 is proper little server with Sata storage and built-in Raid protection

Additionally 120GB and 250GB drives are available for those requiring the maximum amount of space.

You can also specify faster processors, up to 3.2GHz with an 800MHz front-side bus (FSB) at present, and expand the memory to a whopping 4GB should the need arise. However, that's only likely to be for large databases where a more capable dual or quad processor server might be a better choice. We would, though, recommend 1GB or more of Ram on systems used as web or email servers.

Along with the specification we were particularly impressed with the build quality of the NEC server. As with all Express 5800 models, the TM700 is housed in a substantial metal case with plenty of room inside for expansion. An Asus motherboard is used with an Intel 875P chipset and four Dimm slots for all that memory, NEC using PC3200 Ram here. Network attachment is via an integrated Intel Gigabit Ethernet controller with an Adaptec Sata/Raid controller, similarly, built-in as standard.

The Sata disks make for much neater cabling while the onboard controllers leave plenty of free adapter slots, the only exception being the video interface.

The review system came with an ATI RageXL card fitted in one of the five 32bit/33MHz PCI connectors which, with 8MB of video memory, is more than adequate for server use. However, an AGP slot is also provided so you could, in theory, fit something more capable and use the TM700 as graphics workstation.

Indeed NEC offers a choice of optional Nvidia Quadro cards, added to which you get six USB ports, a DVD-Rom drive and

reasonable audio facilities as standard.

In most cases, though, the TM700 will be used as a small business server with a choice of Red Hat Linux or Windows Server 2003 pre-installed at the factory. Norton Anti-virus software is also included along with ESMPRO server management software from NEC itself, plus its Expressbuilder utility to rebuild/recover the operating system should the need arise. A three-year on-site warranty is included, with a range of optional extensions available to improve on the basic next-day response.

Of course some compromises have been made to keep the price low. The disks for example are 7,200rpm devices and you'd need to add an extra controller to handle more than two. You're also limited to just a single processor and a monitor costs extra. But those are all small quibbles about a server ideally suited to life on a small business network and which has a lot to offer at a desktop price.

DETAILS

PRICE £1,173.83 (£999 ex VAT) (monitor extra)

CONTACT NEC 0870 010 6328
www.nec-online.co.uk

SPECIFICATIONS

2.8GHz Intel Pentium 4 • Intel 875P chipset with 800MHz FSB support • 512MB ECC DDR400 memory • Integrated Sata-150 controller with Raid 0/1 support • Two 80GB 7,200rpm Sata hard disks • Integrated Gigabit Ethernet network interface • 5 x 32bit/33MHz PCI slots • Windows Server 2003
PROS Sata storage with hardware Raid 0/1 protection; up to 4GB of ECC memory; can be configured as a high-end workstation

CONS Limited storage expansion; competition from other vendors

VERDICT

A well-built and specified server

PERFORMANCE

★★★★★

FEATURES

★★★★★

ENTERPRISE VALUE

★★★★★

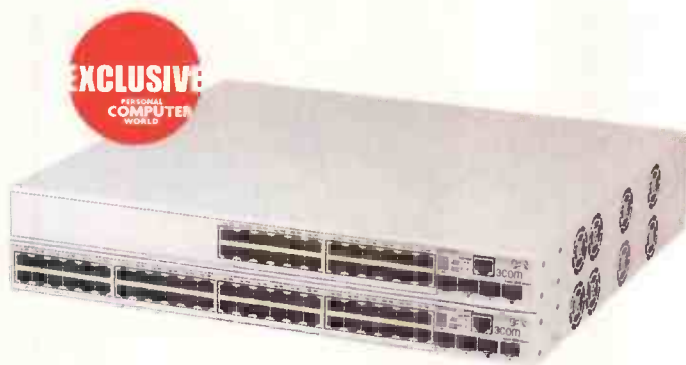
OVERALL

★★★★★

NETWORK SWITCH

3Com Superstack 3870

Gigabit Ethernet moves to the desktop



Superstack 3870 switch's now support Gigabit to the desktop, with 10Gbits/sec uplinks to come soon

With the release of the Superstack Switch 3870, 3Com is hoping companies will start to look seriously at deploying Gigabit Ethernet to the desktop. To this end the new switches come with either 24 or 48 auto-sensing 10/100/1,000Mbps/sec copper ports making it easy to upgrade – simply by changing the Lan adapter at the workstation or server end. Four of the ports also support fibre connections, added to which the 3870 is the first modular switch to include 10Gbits/sec upgrade facilities.

The 3870 has three 10Gbits/sec interfaces, two of which are used to stack switches together. Up to eight can be stacked, supporting up to 384 ports, managed via a single IP address. And, because the links are full duplex, a total of 40Gbits/sec is available across the stacking backplane. The third interface is then connected to an expansion slot and can be used to uplink to a high-speed backbone. Modules to support this are expected later in the year. With a switching capacity of 108Gbits/sec (156Gbits/sec on the 48-port model) the 3870 is primarily a Layer 2 device but it does have Layer 3 capabilities.

There's support too for 802.1Q Virtual Lans, link aggregation

and Layer 3 address filtering. It's conceivable that 3Com could upgrade the firmware to provide greater Layer 3 functionality in the future.

A web interface provides for straightforward management of all the supported features with SNMP and Rmon (remote monitoring) capabilities also built in. Redundant power is another option and, like all 3Com networking products, 3870 switches are covered by a lifetime warranty.

DETAILS

PRICE 24-port £1,821.25 (£1,550 ex VAT); 48-port £2,731.88 (£2,325 ex VAT)

CONTACT 3Com 01442 438 000
www.3com.com

SPECIFICATIONS

24 x 10/100/1,000Mbps/sec UTP ports • 4 fibre-capable ports • Dual full duplex 10Gbits/sec stacking interfaces • Stackable to 8 units • 10Gbits/sec expansion slot • SNMP management plus web interface
PROS Auto-sensing ports; high-speed stacking interface
CONS Price; no Power over Ethernet

VERDICT

Good for growing networks or those with bandwidth problems

PERFORMANCE	★★★★★
FEATURES	★★★★★
ENTERPRISE VALUE	★★★★★
OVERALL	★★★★★



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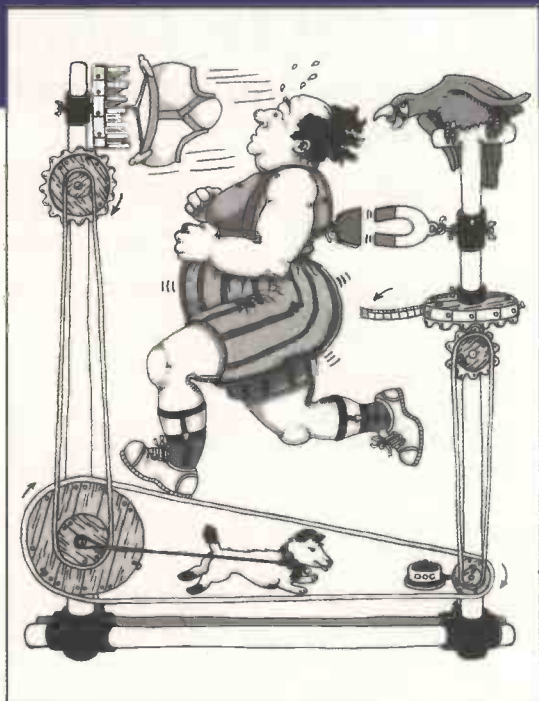
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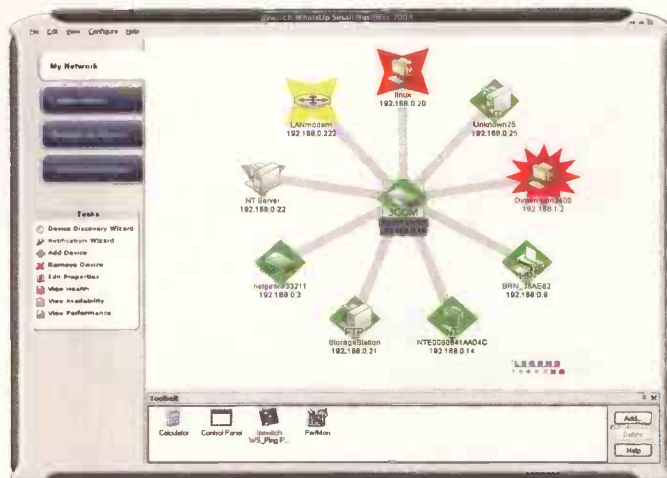


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NETWORK MANAGEMENT

Ipswitch Whatsup SB 2004

Network management made easy



You can only monitor 10 devices with Whatsup Small Business, but that's more than adequate on most small networks

With Whatsup Small Business, developer Ipswitch is aiming to break the mould of expensive and complex network management solutions. Costing just £172 ex VAT, the Ipswitch software is affordable and tightly focused on the needs of the small network manager, providing a good mix of basic health check monitoring plus simple reporting and alerting facilities.

The software can be installed on any network PC running Windows 2000 or later. Installation takes about five minutes after which a wizard guides you through setup, including the detection of existing servers, workstations, switches, routers and other devices on the network. You can then choose 10 of these to be monitored, specifying how you want to be notified when their status changes.

Ten devices may not seem that much, but in practice you only need to monitor critical devices. Also, with a limit of 10 the interface is uncluttered and easy to understand, with the main console showing a map of the devices chosen for monitoring. This map can then be customised both in terms of how the icons are displayed and

what's being monitored. Simple network pings, for example, are the default for checking on availability, but there's SNMP support if required and you can also opt for HTTP, DNS, SMTP, POP3 and other more specific service monitors.

It's very simple, as auto-discovery works out most things for itself with only minimal tweaking required. Health, availability and performance reports can also be run in this well-presented and easy-to-use network management package.

DETAILS

PRICE £202.10 (£172 ex VAT)
CONTACT Unipalm 0870 443 2812
www.unipalm.com

SPECIFICATIONS

Network-enabled PC running Windows 2000, Windows XP or Windows Server 2003
PROS Simple and straightforward interface; good auto-detection facilities; email alerting
CONS May be too simple for the growing small network
VERDICT
By cutting out unwanted functionality this package really does make network management easy

PERFORMANCE ★★★★★
EASE OF USE ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★

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WORDS: ALAN STEVENS

Tuning into wireless work

Setting up a wireless network for a small business can be a nightmare, but identifying the pros and cons of the technologies give you an advantage

Setting up a home wireless network is easy – all you need are a couple of adapters and, typically, a wireless-enabled router to connect the Lan to the Internet. For a growing small business, however, there are one or two extra complications to take into consideration.

To start with, there are a lot more users to cope with and they may not all be using the same hardware or conform to the same wireless standards. Interference can be an issue too, especially in serviced accommodation, with security a major concern that has to be addressed up front rather than at a later date – or never, as often happens on home networks.

Extra users may not sound like much of a problem but they are, as wireless bandwidth is shared not switched. As such, the more users you have connected to a single

wireless gateway, the less bandwidth each will get and the slower the network as a whole will seem. Range can be an issue too, especially in the larger organisation with offices spread across several floors, and the only way around these problems is to install multiple access points, to enable wireless users to connect to the wired Lan in lots of places.

On the plus side, installing extra access points is a straightforward task with lots of very affordable products to choose from, including the 12 we've tested, all of which are listed in the table at the end of this group test. However, some care is needed to make sure you deploy the right technology for the job, and that means understanding the pros and cons of the different wireless technologies, and planning for deployment rather than taking a piecemeal approach.



Wireless G

The first consideration has to be wireless interoperability standards. Fortunately the next big jump in bandwidth (up to 100Mbps/sec) isn't expected for a couple of years and the three existing standards are all tried and tested.

The oldest is 802.11b, which has been around for several years, with lots of very cheap products available as a result. Most notebooks now come with 802.11b wireless capabilities built in, most notably those based on the Intel Centrino chipset. However, there's little point in buying 802.11b access points to build a business Lan, as technology bandwidth is limited to a theoretical 11Mbps/sec (in practice with any of the wireless standards you'll get up to about half the manufacturer's stated bandwidth) and there are much faster products available.

The most popular will be based on the 802.11g wireless standard. This offers almost five times the theoretical bandwidth (54Mbps/sec), but because it uses the same 2.4GHz radio waveband as 802.11b you get a degree of backwards compatibility with the slower products. That means you can build your wireless Lan using fast 802.11g access points but still accommodate guests and others with slower 802.11b equipment. However, slower users tend to degrade the overall performance of a wireless Lan such that many companies don't allow 802.11b access.

When deploying multiple access points you need to space them well away from each other and configure adjoining access points to use different wireless channels to avoid interference. There are, ostensibly, 14 channels to choose from with 802.11b/g but only three are totally separate (non-overlapping), which can be a problem, not just on your Lan but with neighbours too. If you're in a shared building, for example, ceiling-mounted access points on the floor below could present a stronger signal than those on your Lan.

Dual-mode access points

There are lots of dual-mode 802.11b/g access points costing less than £50 ex VAT. We tested eight and found they offer broadly similar levels of performance. Peak throughput came in at around 14-15Mbps/sec, well below the claimed 54Mbps/sec, but that didn't come as a surprise as the claimed rates don't account for the way networks really work. The results are a lot better than the 4-5Mbps/sec typically obtained using 802.11b.

There wasn't much difference when it came to security. All let you disable SSID broadcasts, which is a simple way of 'hiding' a wireless Lan from eavesdroppers. Similarly, all can be configured to only allow clients with known MAC addresses to connect; another crude but effective solution. There's across-the-board support for Wep (Wired Equivalent Privacy) encryption which is currently the most effective way of protecting a small business wireless Lan.

Interestingly not all of the products were from established networking companies, with submissions from Gigabyte and MSI, vendors better known for motherboards. Not that this makes them inferior – far from it, the Gigabyte and MSI access points are well specified and perform as well as any. They're also very affordable, with the MSI product, for example, retailing at

a remarkable £42.54 ex VAT. However, as relatively new additions, neither is widely available and support could be an issue when it comes to business deployment.

Such concerns don't apply to products from more established networking vendors such as Linksys (now a part of Cisco), Netgear, SMC and US Robotics. Unfortunately the SMC access point (SMC2870W) was not quite as fast as the others and the competitively priced Linksys WAP54G lacked range. Both would be fine for home use but for an office Lan there are better products available. Similarly, although we liked the stylish Netgear WG602, it was pretty basic and lacked configuration choices when it came to security. The US Robotics Model 5450 was better specified in this respect, but is relatively expensive and the much-vaunted turbo mode doesn't live up to expectation.

We selected the **Belkin 54g Wireless Access Point** for our **Editor's Choice**. Plus we've given a **PCW Highly Commended** award to the **Buffalo Airstation G54**, both of which are reviewed opposite.

Wireless A

We also tested four access points that support the third wireless standard – 802.11a. This supports the same 54Mbps/sec bandwidth of 802.11g, but because the standard operates in the less crowded 5GHz radio spectrum, such networks are less prone to interference. The technology supports 12 non-overlapping channels making it, in theory, a better choice for use in larger offices where lots of access points are required.

On the downside there's no backwards compatibility to 802.11b, so you have to upgrade all your users to get the extra speed, making it costly. You can't accommodate guests and others using older technology, which is why most vendors now offer 802.11a, on tri-mode products that also support 802.11b/g. These are a lot more expensive than dual-mode implementations but, because they're typically aimed at mid-sized to large business rather than home or small office use, you get more security options and other features.

One feature is support for Power over Ethernet (PoE), which enables access points to be positioned more easily without the need for a separate AC supply. Three of the four tri-mode access points on test had PoE support. The exception being the D-Link DWL-700AP which at £235 ex VAT is roughly half the price of the other three, from 3Com, Enterasys and Proxim.

Although easy to configure, D-Link's access point also lacked some of the options expected on the more expensive products. The 3Com 8750 was better here with, for example, Vlan capabilities and SNMP management. However, it was the slowest here and is bulky, which could be a problem when looking for suitable locations to put it.

In terms of performance the 802.11a radios all gave better results compared to both the 802.11b/g radios in the tri-mode access points and the dual-mode 802.11b/g products. There was little in it between the top three and we selected our **Editor's Choice**, the **Proxim Orinoco AP4000** on functionality, with the **Enterasys Roamabout AP3000** winning a **Highly Commended** award. See full reviews of these two products later.

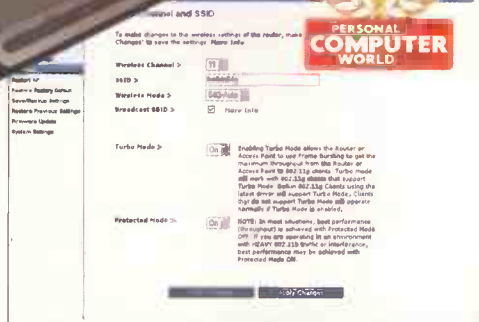


DUAL-MODE 802.11b/g ACCESS POINTS

Like other Belkin products its 54g Wireless Network Access Point is a remarkably affordable, yet still very capable, solution



The browser-based interface on the Belkin access point is simple and straightforward to navigate

**Belkin 54g Wireless AP**

Belkin has a well-founded reputation for selling quality networking products at commodity-level prices. Given that background it wasn't at all surprising to find that the 54g Wireless Network Access Point was almost embarrassingly cheap, beaten only by the MSI product in this respect. The Belkin is a very capable solution and, unlike the MSI offering, widely available from online and catalogue vendors, many offering additional levels of support.

There's not much to worry about when it comes to deployment of the Belkin access point, which features a very simple browser interface. This makes it easy to configure the various options, all of which worked smoothly, all helping ensure the Belkin 54g performed very well in all our tests. So well in fact that we couldn't come up with an adequate reason for choosing a more expensive solution, either in terms of throughput or basic security options.

On the downside the Belkin 54g lacks some of the bells and whistles of more expensive solutions, but you have to pay a lot more to get anything better. Essential security features such as Wep (Wired Equivalent Privacy) encryption, MAC address filtering and support for

the latest WPA (Wifi Protected Access) are all there if you look in the right places.

Physical size could be an issue as the casing is quite large, although it's lightweight and has holes for wall/ceiling mounting. There's no Power over Ethernet (PoE) support, but there rarely is in this price bracket and few small businesses have the necessary PoE switches anyway. Likewise, although Belkin quotes 32 as the maximum number of users, at this price, you can simply install more as user numbers rise.

A lifetime warranty is another bonus you get with the Belkin access point, which makes building an effective wireless Lan easy and affordable.

DETAILS

PRICE £54.99 (£46.80 ex VAT)

CONTACT Belkin
00 800 223 55 460
www.belkin.co.uk

PROS Price; warranty; easy to deploy; performance

CONS Lacks advanced encryption and authentication options

VERDICT

Cheap and works well with all the basic security options

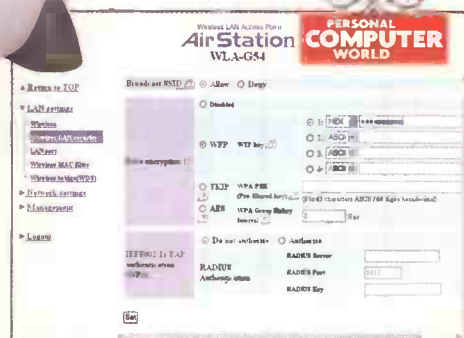
PERFORMANCE ★★★★★
FEATURES ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★



The freestanding Buffalo access point can be wall mounted, but this adds to the price



We found the G54 easy to configure with, for example, a simple choice of Ascii or hexadecimal shared Wep keys

**Buffalo Airstation G54 WLA**

Although we found little difference in performance terms between the various dual-mode access points, the Buffalo Airstation G54 did have a slight edge. It also comes with an integrated four-port 10/100Mbps/sec Ethernet switch rather than a single Ethernet port, unlike the others on test. This is a feature worth having on a small network, if not of great value on larger Lans.

The Buffalo access point is well made and specified but is more expensive than our Editor's Choice and, as delivered, is designed to be freestanding rather than wall or ceiling mounted. A separate wall-mount kit is available but, that adds to the price (around £24 ex VAT). Also available are external aerials to further extend the range of the built-in antenna albeit, again, adding to the price.

Initial setup and day-to-day management are done using a straightforward browser interface with a good selection of security options. Among these you get Wep encryption to 128bit with support for TKIP (Temporal Key Integrity Protocol) and WPA, which together address many of the issues related to Wep. There's support too for the AES

(Advanced Encryption Standard) algorithm with MAC address filtering another option. You can also disable SSID broadcasts.

We found most of these options easy enough to configure with, for example, a choice of Ascii or hexadecimal shared key input, unlike on some of the others we looked at in this group test.

Another advantage of the Buffalo access point is that it can also be used as a wireless bridge, to join a wired sub-net or single Ethernet-enabled device to the wireless Lan. The hardware is also readily available, guaranteed for two years, and well supported by Buffalo, third-party vendors and specialist support sites.

DETAILS

PRICE £88.12 (£74.99 ex VAT)

CONTACT Buffalo 01753 555 000
www.buffalo-technology.com

PROS Good performer; easy setup; integrated 4-port switch

CONS Wall-mount kit and external antennae add to price

VERDICT

Not the cheapest, but a good access point from a respected vendor with a lot to commend it

PERFORMANCE ★★★★★
FEATURES ★★★★★
ENTERPRISE VALUE ★★★★★
OVERALL ★★★★★



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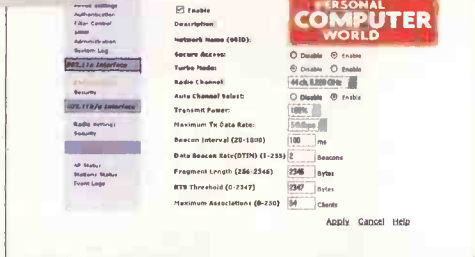
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TRI-MODE 802.11b/g/a ACCESS POINTS

Not as small as some, the Roamabout AP3000 can be wall or ceiling mounted and draw its power over the network



Individual management can be achieved via a browser or Telnet with SNMP management

**Enterasys Roamabout AP3000**

Although it doesn't quite match the Proxim access point in terms of functionality, the Enterasys Roamabout AP3000 is a well-featured device and a good deal cheaper than the Orinoco solution. It can also be purchased without the 5GHz radio interface, for £343 ex VAT, if you don't need the extra waveband and want to save money. However, if it's then compared to alternative dual-mode 802.11b/g access points, it's not such good value.

The Enterasys hardware is quite large but very robust and it can be wall or ceiling mounted to maximise range. You also get that all-important PoE support as standard, enabling power to be sent down the UTP network cable rather than having to install a separate AC point. No additional aerials are available, but the two external antennae provided give good coverage.

As well as browser and Telnet management, there's support for SNMPv3 allowing for remote management using Enterasys Netsight and other SNMP packages. We used the browser interface, which was clear and easy to use, although we did have to reboot a few times when making changes.

On the security front, there's the usual Wep encryption (up to

128bit) with support for the AES algorithm also built in. WPA technology is, likewise, included as standard and the access point is described as 802.11i ready – that's the forthcoming IEEE replacement for WPA. 802.1x user authentication is yet another option, and it's possible to configure up to 64 VLANs on the Roamabout AP3000.

On the performance front, the Enterasys access point did very well. It didn't quite match the Proxim AP-4000, but was good enough nonetheless to be given our Highly Commended award. It's also a very solid and well-supported solution, and is well suited to small to medium-sized business deployment.

DETAILS

PRICE £538.15 (£458 ex VAT)

CONTACT Enterasys
01635 580 000

www.enterasys.com

PROS Optional 802.11a radio; PoE support

CONS Configuration not the easiest

VERDICT

A good solution for companies looking to maximise their wireless investment

PERFORMANCE ★★★★★

FEATURES ★★★★★

ENTERPRISE VALUE ★★★★★

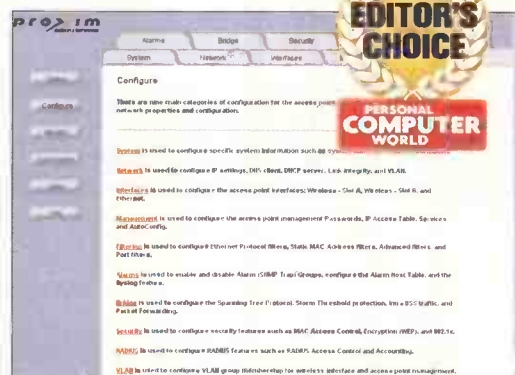
OVERALL ★★★★★



The Proxim AP-4000 – small on the outside but inside it's very well equipped



There's the usual browser interface for management of the Proxim access point plus SNMPv3 support

**Proxim Orinoco AP-4000**

Proxim's Orinoco AP-4000 is relatively small compared to the other three tri-mode products. Despite that, it's a big company solution with lots of features beyond basic wireless networking.

To start with the 2.4GHz and 5GHz radios can be used simultaneously to support a large number of users, with built-in bridging facilities to enable subnets to be joined wirelessly. You also get PoE support, doing away with the need for a separate AC adapter and making it a lot easier to site the AP-4000 for maximum range. And here the internal antennae are as good as the external aerials on cheaper products with optional high-gain external add-ons available.

As well as the usual browser-based interface the AP-4000 can be centrally managed alongside other Orinoco products on a large network, with SNMPv3 and secure HTTPS support as standard. You also get a comprehensive set of security features including 152bit Wep encryption, WPA support and the ability to configure up to 16 Virtual LANS (Vlans) per radio. You can also define security settings on a group basis. Advanced port, protocol and address filtering facilities are provided, together with 802.1x and Radius authentication.

Another key differentiator with the AP-4000 is its ability to detect rogue access points not sanctioned by the network manager. It does this by scanning both the 2.4GHz and 5GHz wavebands for other access points in the background while continuing to handle foreground traffic as normal. Optional Wavelink Mobile Manager software can then be used to point up and identify the non-authorized traffic.

With so many options the Proxim access point is a lot harder to configure than the others in this group test. However, it matches them all on performance terms and as a business network solution is hard to beat.

DETAILS

PRICE £645.08 (£549 ex VAT)

CONTACT Proxim 01234 262 390
www.proxim.com

PROS Small with PoE for easy deployment; rogue access point detection; multiple Vlan support

CONS Configuration not the easiest

VERDICT

Not cheap, but the price reflects its dual-band capabilities and impressive security features

PERFORMANCE ★★★★★

FEATURES ★★★★★

ENTERPRISE VALUE ★★★★★

OVERALL ★★★★★

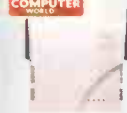
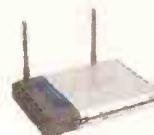


Table of features

	DUAL-MODE ACCESS POINTS					
						
	BELKIN	BUFFALO	GIGABYTE	LINKSYS	MSI	
	54G WIRELESS NETWORK ACCESS POINT	AIRSTATION G54 WLA-G54	GN-A17GU	WIRELESS G ACCESS POINT WAP54G	WIRELESS ACCESS POINT AP54G	
Price inc VAT (ex VAT)	£54.99 (£46.80)	£88.12 (£74.99)	£76.97 (£65.50)	£63.45 (£54)	£49.99 (£42.54)	
Telephone	00 800 223 55 460	01753 555 000	0800 093 9995	0870 739 3939	020 8813 6608	
URL	www.belkin.co.uk	www.buffalo-technology.com	www.leapfrogcomputers.co.uk	www.linksys.com	www.msi.com.tw	
Warranty (years)	Lifetime	2	1	2	1	
PHYSICAL						
Antennae	2	Internal	1	2	1	
Additional antennae available	X	✓	X	X	X	
Wired Ethernet ports	1	4-port switch	1	1	1	
Serial port	X	X	X	X	X	
Wall/ceiling mount	✓	Optional	✓	✓	✓	
PoE support	X	X	X	X	X	
WIRELESS STANDARDS						
802.11b (11Mbps/sec)	✓	✓	✓	✓	✓	
802.11g (54Mbps/sec)	✓	✓	✓	✓	✓	
802.11a (54Mbps/sec)	X	X	X	X	X	
MANAGEMENT						
Custom GUI	X	X	✓	X	X	
Browser GUI	✓	✓	X	✓	✓	
SNMP	X	X	✓	✓	X	
SECURITY FEATURES						
Disable SSID broadcast	✓	✓	✓	✓	✓	
Wep 64bit	✓	✓	✓	✓	✓	
Wep 128bit	✓	✓	✓	✓	✓	
Wep 152bit	X	X	✓	X	X	
Wep 256bit	X	X	X	X	X	
Wifi protected access	✓	✓	✓	✓	✓	
802.1x authentication	X	✓	✓	X	✓	
Radius user authentication	✓	✓	✓	✓	X	
MAC address filter	✓	✓	✓	✓	✓	
VLANs	X	X	X	X	X	
Rogue AP detection	X	X	X	X	X	
DHCP SUPPORT						
DHCP server	X	X	✓	X	X	
DHCP client	X	✓	✓	✓	✓	
SCORES						
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	
Enterprise value	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	

For the best multimode access point prices go to www.pcw.co.uk/bestprices

TRI-MODE ACCESS POINTS



NETGEAR

SMC

US ROBOTICS

3COM

D-LINK

ENTERASYS

PROXIM

WG602

EZ CONNECT G
SMC2870W

WIRELESS TURBO
MULTI-FUNCTION
ACCESS POINT -
MODEL 5450

WIRELESS LAN
ACCESS POINT
8750

AIR XPERT
WIRELESS ACCESS
POINT -
DWL-7000AP

ROAMABOUT
AP3000

ORINOCO ACCESS
POINT AP-4000

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www.netgear.co.uk

www.smc-europe.com

www.usr.com

www.3com.com

www.dlink.co.uk

www.enterasys.com

www.proxim.com

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Hands on



EDITED BY NIGEL WHITFIELD

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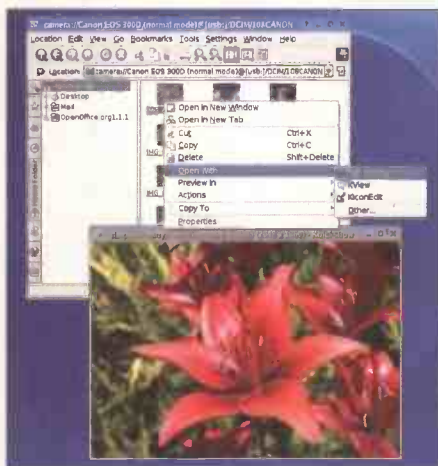
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News on Microsoft's Team System, and using ASP.Net to provide secure logins



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Learn how to equip your PC with infra-red remote control facilities in our Hardware column



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The Linux/Unix column shows you how to use Konqueror to access images



PAGE 186

See Digital imaging and video to find out how to digitise old transparencies and negatives

Perhaps it's the summer and the prospect of all those holiday snaps that makes photos a popular topic with Hands on writers; this month, Barry Shilliday explains how you can manage photos and digital cameras graphically under Linux, while in Digital imaging, Ken McMahon explores the possibilities for converting those old shoe boxes full of prints and negatives into digital formats; he also looks at the Windows version of Linux graphics program Gimp. On a different creative theme, Niall Magennis explains the ins, outs and pass-throughs of Midi in the Sound column.

Over in the Hardware corner, Gordon Laing looks at remote control options to make your PC more like a piece of home electronics, and the various ways in which you can watch TV pictures on a computer monitor. In the second of his Overclocking columns, meanwhile, we find out just how far you can push a 2.4GHz chip before it complains.

In the rather more sedate world of office applications, Mark Whitehorn explains how to make standalone files with Access, and Tim Nott has a range of tips and tricks for managing problems with Word's Normal.dot template. And Stephen Wells' 10th anniversary spreadsheet column takes a look at Pivot tables, and finds they're really not as scary as you might have imagined.

Visual programmers can find out how to use ASP.Net to provide secure logins to a website, and read the latest on Microsoft's lifecycle tools, while in Web development we've a look at some of the handy features in Opera, and how you can use them to help visitors make the most of your site.

As ever, Tim Nott and Terence Green are on hand with help and advice for users of all the Windows operating systems. We've tips on hard disk errors, recovering files from Chkdsk, hidden features in help, the mysterious case of the missing icons and why Windows update problems could have helped the Sasser worm.

To round it all off, Alan Stevens is here to explain how to set up Windows XP as a VPN (virtual private network) server in Networks, and there's a look at net telephony in the Mobile computing column – not forgetting, of course, four pages of problems solved in Question time.

So, if the summer heat's getting to you or your PC, settle down with Hands on, or write in to let us know how we can help.

Nigel Whitfield





Advice from our experts

Our Hands on experts answer your questions and solve your problems

Databases

Q I produce multiple reports that contain identical data but sorted in different ways. Is there a quick method of altering the way in which data is sorted; quicker, that is, than going back to the drawing board and designing the report again from scratch?

Carl Wade

A There certainly is – the Sorting and Grouping button sounds like it's just what you need. With a report open in Design mode, locate the button with an icon that looks like a two-pin electrical plug (what this has to do with the task in hand is anyone's guess). A Sorting and Grouping dialogue opens. Here you can select the field or expression to sort upon and specify whether the sort order is to be ascending or descending. Several levels of sorting can be applied, and you can change the order of sorts by clicking and dragging. In screenshot 1 CD records are sorted, firstly by artist and then by title.

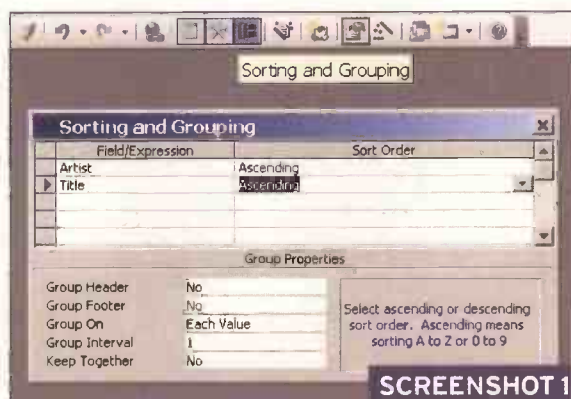
The Sorting and Grouping dialogue repays further experimentation because you can also set up group properties to further alter the display: adding a Group Header, for instance, puts an extra band into the report above each group of sorted records.

Digital imaging

Q I need to create a CD of pictures for viewing on a TV. I have worked out that the best size for these images is 720 x 576. I would like to add a small amount of sharpening to all the pictures, as experimentation shows this gives the best TV picture, however I cannot find any way of doing a Batch Resharpen using preset Unsharp Mask parameters. Can you advise on how this might be done and with what software – preferably free or low-cost?

Lastly I am not sure of the best way to create the CD for maximum picture quality. Currently I simply write the files to disc which my DVD player reads OK and allows individual or slideshow presentation. Would another CD or DVD format give better pictures, ie VCD, SVCD or even creating a movie in mpeg and burning a DVD video?

Ron Killick



The Sorting and Grouping dialogue with two ascending sorts in place for a report

A To carry out a batch unsharp mask on a folder of images you'll need an image editor that supports scripting. Photoshop can do this kind of thing very easily, but it isn't what you'd call a low-cost option. Less expensive applications that support scripting and should be able to do what you require are Jasc Paint Shop Pro 8 and The Gimp, which you can find out more about in this month's Hands on Digital imaging section (page 186).

If your DVD player can display jpegs, there's little point in changing the format as you will see no quality improvement. In fact, with VCD and SVCD, it's likely to be worse. The only advantage in creating an mpeg-2 video of the slideshow would be wider compatibility with domestic DVD players – if you plan to give copies to other people.

You can create DVD slideshows using Windows Movie Maker 2 which is free from the Microsoft website. Another advantage of doing it this way is that you can include pan, zoom and transition effects as well as a soundtrack.

Hardware

Q I have an old Primax scanner I'd like to use on a new Windows XP system, but it only came with drivers for Windows 98. After searching Google I found drivers for Windows XP, but when I try and install them I receive a warning saying they've not been verified for XP compatibility. Are they safe to install?

Sue Smith

A Most likely. Microsoft has a Windows logo testing policy where drivers can be tested for full

compatibility with Windows XP, after which they're 'digitally signed'. These signed drivers will then install without a hitch, but unsigned ones will present the warning you received. This doesn't mean there's anything wrong with the drivers, just that the company hasn't put them through the logo certification process. Indeed, normally only the largest hardware manufacturers bother with this process and, even then, their latest driver versions may not yet be signed.

Our advice is to click the button to 'Continue anyway' with the driver installation. If they don't work you can always uninstall them or update them with different ones. Finally, if Microsoft's persistent warning is beginning to grate, you can disable it by opening your System Properties, clicking Driver Signing under the Hardware tab, then checking 'Ignore'.

Q I'd like to upgrade an old P133 system with 16MB of Ram and a 1.2GB hard disk. I was hoping to fit a 40GB disk, 256MB of Ram and 1.3GHz processor. Is this possible?

Simon Johnston

A The degree to which these components can be upgraded (in any computer) is almost entirely down to the capabilities of your motherboard and its Bios software. So your first step should be to visit your motherboard manufacturer's website to download and install the latest Bios available, and check what processors and disks it will support.

Unfortunately electrical and physical socket differences will limit your upgrades more than anything else. The fastest chip Intel made which will fit in your motherboard socket ran at 233MHz, and is almost impossible to buy even second-hand. While 256MB of modern memory is cheap, the modules that fit your old motherboard almost certainly won't be. You should have better luck with a bigger disk though, so long as your Bios supports it and you're running Windows 95 or later.

In order to use modern processors and memory, you'll simply need to buy a new motherboard, although you'll probably also need to upgrade your power supply to a modern ATX



model. In short, you'll need to gut most of your PC to upgrade it to the level you're after.

Spreadsheets

Q I am a winemaker trying to organise the colour of capsules on different bottles of wine. Can an Excel Combo box, listing the colours, be used to change the background colour of a selected cell? If so, how? And how do I construct an array formula that will count the number of bottles by their colour capsules?

Rob Hemphill

A Rather than a Combo box I suggest you use the built-in Styles box. Click the Toolbar Options arrow on the right-hand side of any toolbar and choose Customize. Go to the Commands tab, and then Categories, and choose Format. From the right-hand box drag the Style dropdown box up onto the Format menu. This becomes your selection box. Close the Customize dialogue box. Choose Style on the Format menu and specify the font and background Style you want for each colour. Later you can hold down Ctrl and click on the cells you want to be red and choose Red in the Styles box.

First, make a sample list of wines in the range A2:A10 with the number of bottles in stock of each wine in B2:B10. In C2:C10 enter the appropriate capsule colour for each wine. Name the range B2:B10, Bottles. Name C2:C10, Colour. If you list all the required colours in E2:E7 as a key you can enter the bottles totalling formulas beside them in F2:F7. The array formula you need in F2 is:

```
=SUM(IF(Colour="Green",  
Bottles,0))
```

(Key: ✓ code string continues)

and in F3 is:

```
=SUM(IF(Colour="Red",  
Bottles,0))
```

and so on, entering each formula with Ctrl & Shift & Enter (see screenshot 2).

Q On an Excel worksheet I have a large total of worked hours and minutes. How can I get the cell to display this in days, hours, and minutes?

Liz Gaskell

A Supposing the cell is C20, that it is currently formatted [h]:mm, and displays the total 100:15. Use the following Custom format instead: d "days," h "hrs," m "mins". The cell will now show: 4 days, 4 hrs, 15 mins.

Q Is there an elegant way to convert and display degrees expressed as decimals, like 137.567, to degrees, minutes and seconds, as in: 137° 34' 1".

Cliff Hamer

A This isn't elegant but it works. Enter 137.567 in cell A2. In any cell, temporarily choose Symbol on the Insert and enter a degree sign. Then, using Alt & C and Alt & V, copy and paste that sign into this formula entered in B2:

```
=TEXT(INT(A2),0)&"°"
```

In C2 enter:

```
=INT(MOD(A2,INT(A2))*60)
```

and by copying and pasting the right symbol give this cell the Custom Format, 0""". In C3 enter:

```
=MOD(INT(A2),C2)
```

and similarly Custom format this cell: 0""".

This little trick gets around the limitations of Custom formatting (see screenshot 3).

Q Is it possible to put a Comment in an Excel cell which a user can't remove by right-clicking and choosing Delete Comment?

Clem Pavey

A I suggest you use Data Validation on the Data menu. Choose the Input Message tab and tick the box, Show input message when cell is selected. Then enter your comment in the Input message box.

Q I have a workbook containing 56 worksheets. How can I quickly find the worksheet name that I require without having to scan through them all manually?

Jim Leary

A Right-click on the arrows to the left of Sheet 1 and you'll see a shortcut menu of your worksheets.

Q When entering items in a list I often have to type in some of them numerous times. Is there some way of creating a pick list, without duplicates, from the existing entries?

Debbie Cowan

A In recent versions of Excel there is indeed a shortcut for doing this. Click on any cell in the same column and press Alt & Down Arrow. An edited list will appear, containing just one instance of each item in the column. You can pick from this list either with the mouse or by letting go of the Alt key and using the Up and Down Arrows. The

Red Arial 10 **SCREENSHOT 2**

	A	B	C	D	E	F
1	Vine	No. Bottles	Capsule Colour		Available Capsules	No. Capsules Required
2	Chardonnay	1,279	gold			578
3	Shiraz	2,887	red			12,641
4	Reisling	578	green		gold	2,059
5	Cabernet	3,559	red			
6	Bacchus	950	silver			765
7	Pinotage	1,695	red		silver	950
8	Sauvignon	4,500	red			
9	Pinot Blanc	780	gold			
10	Merlot	765				

Colouring cells and counting bottles in a cellar list

Microsoft Excel - degrees.xls **SCREENSHOT 3**

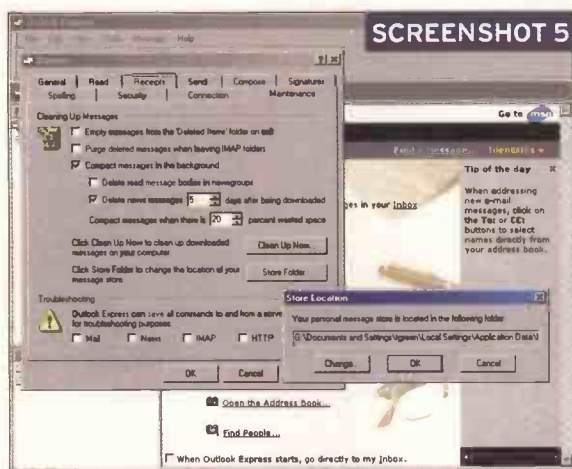
	A	B	C	D	E
2	137.567	137°	34'	1"	
3					

Displaying degree decimals as minutes and seconds

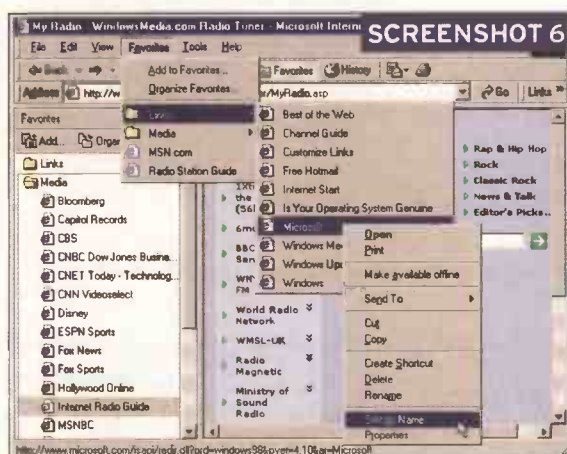
	A	B
1	Members	Subs
2	Charles	Paid
3	Debbie	Paid
4	Frank	Due
5	Iris	Comp
6	Ron	Due
7	David	Paid
8	Arthur	Comp
9	Poppy	
10	Gus	Comp
11	Candy	Due
12	Eric	Paid
13	Maisy	
14	Harry	

SCREENSHOT 4

A shortcut for creating a pick list from a column



Moving the Outlook Express message store



Getting those favourites in order



You can have any name and icon for a file type

list only displays text items but it should solve your particular problem (see screenshot 4).

Windows 2000

Q Every time I call up Outlook Express I see a red-flag warning that there has been a sharing violation and that it 'cannot delete ntuser.dat'. It goes away when closed. I have renamed all such files that I could find, without harm but with no cure.

Geoffrey Smith

A The fix for this problem is to create a new user identity in Outlook Express, following these steps in the exact order described. Start Outlook Express and use File/Switch Identity/Manage Identity to create a new identity. Switch to the new identity. Now, bring up Manage Identity again. Select the Main Identity and ensure that there is a tick in the selection box for 'Use this identity when starting a program'. Also ensure that the Main Identity is selected in both that entry box and the 'Use this identity when a program does not ask you to choose an identity' entry box.

Scott Atkins, a Microsoft employee, posted the above solution in the Microsoft public newsgroups. The warning can appear if the Outlook Express message store is moved or there is a problem saving the user profile. This might happen if files are damaged in a power cut, or if system-critical files in Documents and Settings have been moved, renamed, or deleted with Windows Explorer. There is a supported way to move Outlook Express files, through the Tools/Options/Maintenance/Store Folder. Click on Change to move the Outlook Express message store data to a new location. ntuser.dat is a critical system structure and should not be moved or deleted. It is the file in which the Current User portion of the Registry is stored. The data is continually updated and saved in the user profile folder. Each individual user account has its own copy along with a log file (see screenshot 5).

Windows

Q I recently decided to build my own computer and have had a number of problems. I've managed to solve all but one of these. I noticed during the partitioning stage that the partition size seemed smaller than I expected for my 160GB hard disk. It was saying: C: Partition 1 [New Raw] 131062MB (131061MB free on 131070MB Disk 0). When the XP Pro installation had finished I looked at the hard drive properties

and noticed that the computer was saying that I only had a 127GB hard disk. I installed Service Pack 1 and in Disk Management it now says that I've got 127.99GB and 21.05GB unallocated. I'm wondering where the remaining 10.96GB of disk space is?

Jason Williams

Q There are two issues here, and the missing 10.96GB is the easier to answer. The value of a gigabyte, to be blunt, depends on whether you are buying or selling. Traditionally, disk vendors define a gigabyte as 1,000 x 1,000 x 1,000 bytes. Windows defines a gigabyte as 1,024 x 1,024 x 1,024 bytes. If you do the sums, you'll find that this accounts for the 'missing' 10.96GB. The 'unallocated' 21.05GB simply hasn't been partitioned. You may be able to recover this using a third-party utility such as Partition Magic, or you may be able to extend the existing volume using the Diskpart utility from a command prompt. We don't have space to go into details on this but you'll find more information in XP Help and at the Microsoft Knowledgebase article 325590. Be sure to back up all your data before doing this.

Q I have Windows 98SE. How can you sort the Favourites in Internet Explorer? When you right-click there is no Sort option. It would save a lot of time having to drag them into position.

Keith Lambert

A This can be done, and the trick is to right-click in the Favourites menu (or sub-menus) where you'll see a 'Sort by name' option, rather than in the favourites Explorer bar at the left of the screen (see screenshot 6).

Q In Windows XP (Home) there appear to be two Registry Editors, Regedit.exe and Regedt32.exe. What is the difference between them, and which one should I use?

Graham Langer

A There's no functional difference: Regedt32.exe is just a 'stub' that loads Regedit.exe. The name is kept for compatibility with the Windows 2000 Registry editor (Regedt32.exe), which had the Favourites and Permissions features that weren't included in earlier versions of Regedit.exe. The XP (and 2003 server) version of Regedit.exe now includes these features.



Q I have just rebuilt my XP Home system and have a large number of wav and mp3 files. I mistakenly installed Creative Labs' Playcenter, which now thinks these files are all Playcenter types. I changed the association for wav and mp3 files, and the system now plays them using Adobe Audition. This is fine, but how do I change the icon for all these files, and how do I force XP to stop telling me the files are Playcenter type?

Geoff Tufnell

A This isn't difficult. Go to Explorer, Tools, Folder Options, File Types. Find mp3 in the list, highlight it and click the Advanced button. You'll then get the opportunity to change the name of the file type in the top box. Next, click on the Change Icon button, then browse to the icon of your choice. Leave all the 'Actions' below as they are, as you already have the files opening correctly. Repeat the process with the wav file type (see screenshot 7).

Q I am trying to follow the XP help to enable Internet Connection Sharing but I can't find the 'Network Tasks'. Where is it?

Sal Digby

A First, make sure you have 'Show common tasks...' selected in Explorer Tools, Folder Options, General. Then navigate to Control Panel, Network Connections. If you don't have 'Network Tasks' in the left pane, click on the Folders button on the Explorer toolbar. And if you don't have the toolbar visible, turn it on from View, Toolbars, Standard Buttons (see screenshot 8).

Word processing

Q I've been looking for some diary software. I'd like something where I can record events on a particular day and perhaps link photos or video to events. It would be great if I could then insert a keyword later – perhaps someone mentioned in a birthday party journal entry – and get a reference.

Mike Nunez

A Since you've written to the Hands on Word processing column, our answer is that any competent word processing application should be able to manage this. In Word, for example, you have the choice of inserting hyperlinks to pictures (or other media files) or displaying a linked picture within the

document, without having to store it in the document file. Keyword searches can be performed with Edit, Find, and it is a very simple business to record an Autoopen macro that puts the cursor at the end of the document each time it is opened, and then inserts the date.

Q Is there a way I can intercept Word commands and use them in my own VBA projects, modifying the code to suit my own ends?

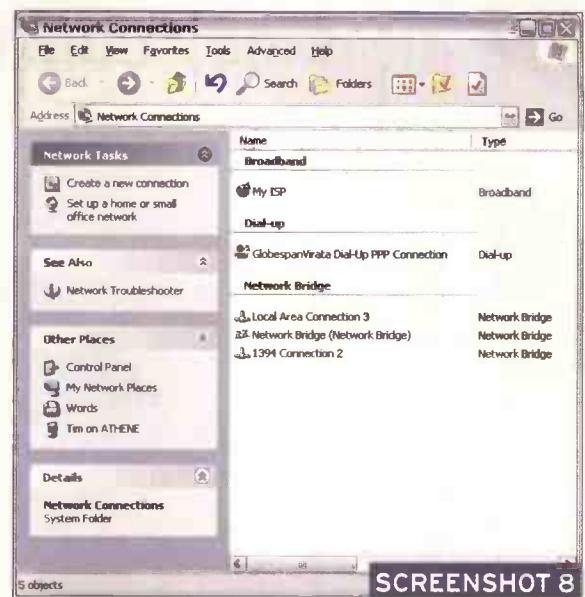
Gerard Lacey

A Yes, it just takes a simple, but cunning, bit of juggling. For simplicity's sake, let's assume you want to store the code in the current document, which is called Myproject.doc. Go to Tools, Macro, Macros, and from the Macros in: box, select 'Word commands'. Now select the command you want to use as the basis for your code – let's say it's FilePrint. When you highlight this, its name will appear in the Macro Name box at the top of the dialogue. Now comes the cunning bit. Without changing anything else, go back to the Macros in: box and select 'Myproject.doc' (see screenshot 9). Now hit the Create button, and the VBA editor will load with a copy of the FilePrint code loaded into a macro in your document.

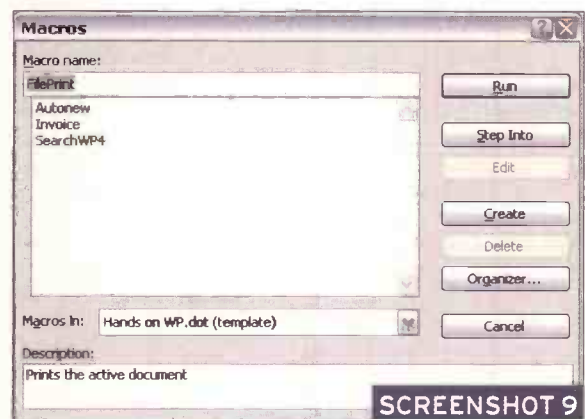
Q While editing a document in Microsoft Word 2000, I accidentally created a horizontal line right across the page. It doesn't seem possible to delete this or even select it – how can I get rid of it?

Nancy Barnes

A What you have there is a border belonging to some text, rather than a line in its own right. To get rid of it, place the insertion point in the paragraph immediately above or below the unwanted line (it helps to have paragraph markers made visible) and then Format, Borders and Shading, None. You can also do this from the toolbar border button – this has the advantage of being 'sticky' so once you've set it to No Border it will stay that way for future use. If you want to stop Word spontaneously adding borders, then go to Tools, Autocorrect, Autoformat As You Type. Deselect the Borders option. This will stop Word turning, for example, three or more dashes (followed by Enter) into a single-line, or three hashes into a triple line. To stop this on a one-off basis, type a space between the final dash and Enter, or Alt & Backspace immediately after the line appears.



Locating the 'Network Tasks'



Copying a Word command into your own VBA project

CONTACTS

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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

It's all under control

Access your PC by remote control, turn a monitor into a TV and fit a disk enclosure

Remote control is a fundamental aspect of any consumer appliance, yet one which continues to prove a challenge for PCs. As an increasing number of PCs are used to house media collections, though, the need for a standard remote solution is becoming essential.

Recognising the problem, many TV tuner and all-in-one graphics cards now come with remote controls, but these don't always interface with your other applications as well as you'd like. Microsoft offers a remote control with its Media Center PCs, but these are only available as pre-assembled systems and, therefore, are not a suitable option for existing machines.

One of the most popular solutions is Evation's IR-man receiver (around £25 from www.evation.com) which is natively supported by Winamp and the Showshifter front-end. For greater control, it also works well with utilities such as Girder (www.girder.nl) and IR-Assistant (www.irassistant.com), although you'll need to put aside some time to program them.

While some media cases are designed to internally house the IR-man receiver, it's really an external solution which normally sits on top of or beside your case. Even many Media Center PCs employ external infra-red receivers, which is hardly embracing the consumer-friendly dream. The receiver should be internal, just like a consumer appliance. After all, you wouldn't tolerate a dongle receiver sat on top of your TV or VCR.

It is frustrating that there's no standard internal remote receiver that works with Windows, but until Microsoft and the motherboard manufacturers agree on a solution, media PC enthusiasts will have to rely on third-party products. Mercifully, these are improving with each generation. One of the best I've tested recently is Soundgraph's Wireless Freedom Imon.

Soundgraph Imon

Soundgraph's Imon is available in two versions: an external USB receiver called the Imon Station, and an internal model called the



Soundgraph's Internal Imon unit fits into a drive bay to equip a PC with infra-red remote control facilities. This internal model can also connect to power headers on a motherboard, allowing it to switch on a PC by remote control

Imon Inside. The latter is available in black or silver and is designed to fit inside a 3.5in drive bay (see picture above). Soundgraph offers the receivers with a choice of two remote controls – the basic MM model or the more sophisticated RSC model, which sports a joystick for controlling the mouse pointer. For further information visit http://imon.soundgraph.com/index_e.html.

Quiet PC (www.quietpc.com) sells the Imon Inside with the MM or RSC remotes for £49 or £59 ex VAT respectively. The external Station receiver costs £39 or £49 ex VAT with the MM or RSC remotes. All models are supplied with Soundgraph's Multi-Median front-end software, which runs on Windows 98 or later.

While the external Imon Station has an attractive eye-like design, I was drawn to the Imon Inside model. Not only is it neater, but it boasts the unique ability to power-on your PC with just a press of the remote control.

The Imon Inside is a simple tray which fits into a spare 3.5in drive bay. It connects to any spare internal USB header, thereby eliminating the need to feed cables out the back of your case – something several internal IR solutions surprisingly demand. Where the internal Imon really scores, though, is its ability to intercept the power switch of your case.

Soundgraph offers the choice of two different remote controls with the Imon receiver. This is the Remote Stick Controller (RSC), which includes a joystick to control the mouse pointer. It comes with Soundgraph's 'Plus' bundles



In most PCs, the power button is connected to a two-pin header on the motherboard, usually next to the headers for the reset button and various case lights. The power button's lead should be disconnected from the motherboard and plugged into the back of the Imon Inside. Another lead then connects the Imon back to the previous motherboard power header.

This allows the Imon to power-up the PC by remote control, but to do so it must always have a current running through it. This is achieved using a fly-lead from a short extension cable to the motherboard's 20-pin ATX power lead. A small light on the Imon's front panel then remains illuminated, indicating that it's in standby mode, just like a television.

A supplied utility allows you to configure the unit for use with different applications, along with switching tasks or desktop resolutions. Soundgraph also includes its Multi-Median software, which delivers an attractive front-end user interface for navigating and viewing photos, music and video (see screenshots 1 and 2).

While it's not quite up to the standard of Microsoft's Media Center interface, Soundgraph's software is pretty slick nonetheless. More importantly, it is available to anyone building their own media PC. It's a good option for anyone wanting easy yet powerful infra-red remote control facilities for their PC.

Wifi remote control

Infra-red is, of course, not the only technology to deliver wireless remote control capabilities. Radio technology can also be used for remote controls and has the added benefits of not needing to be pointed at the unit, or even be in the same room. Such remotes are supplied with many all-in-one graphics cards and TV tuners.

Radio technology is also behind what's probably the neatest way to control a media PC remotely. If your PC is connected to a wireless network, you could control it with a Wifi-equipped PDA.

Several utilities are available that effectively turn Wifi PDAs into large touchscreen remote controls. They will work wherever your wireless network has coverage and, as a bidirectional



Left: The Multi-Median software supplied with Soundgraph's Imon offers a Media Center-style interface for navigating your PC's drives and viewing media

Below: The photo viewing and slideshow interface of the Multi-Median software



technology, can receive information from the PC. This allows the PDA to display the same artist, track and album artwork you'd normally see on your PC's media player.

One of the most popular utilities for achieving this is Netremote, which can be downloaded from www.netremote.org. The first step is to install the Netremote suite on the PC to be controlled, then install the client software on your wireless portable. Versions are available for PocketPC PDAs running 2000, 2002 or 2003 software, along with full Windows in case you'd prefer to use a notebook or Tablet PC. Numerous user interfaces have been designed for Netremote or you can create your own custom controls and macros.

While I personally believe the killer environment for Netremote is on a Wifi portable over a wireless network, it also supports line-of-sight operation for PDAs with consumer infra-red capabilities. This, in turn, could see it doubling up as a universal remote for traditional consumer appliances. Check the forums on the Netremote website for more information.

Remote controlling PCs can certainly be a challenge, but it's one that's worth cracking for anyone who uses their system as a media player. It's also something that is under constant development, so will be revisited in future hardware columns. In the meantime, though, I'd love to hear from anyone who's had any good or bad experiences with remote controls on their PC.

Use a monitor as a TV

A question which regularly crops up in the Hardware mailbox is whether it's possible to connect games consoles, DVD players, VCRs and the like to a PC display, or use it for watching TV without the aid of a PC. It's an understandable desire, given

that many people have spare displays or only have the room or budget for a single screen. It's even more tempting when you compare the price of 15in LCD monitors with similarly sized LCD TV sets.

Unfortunately, there are two main technical hurdles to overcome. First, and most obvious, are the actual inputs on the back of a monitor, which are typically either analogue, VGA or digital DVI. Unfortunately, the composite, S-video or RGB connections of most consumer appliances are not compatible. The closest match is consumer RGB on a Scart and analogue VGA, which would still require an adapter.

The second problem, though, is harder to overcome. The standard Pal or NTSC video signal generated by consumer appliances falls way below the range that a PC monitor can lock onto. So even if you built an RGB Scart-to-analogue VGA adapter, the PC monitor would still not be able to display the signal.

The Avermedia TV Box 9 allows you to connect a games console or watch TV shows on your monitor without the need for a PC. Great if you've got a spare display or fancy turning an affordable LCD monitor into a trendy TV set



Consequently, some kind of converter box is required to accept consumer inputs and up-convert their signal to something a PC monitor can lock onto. Several solutions exist, many also incorporating TV tuners and even remote controls.

Avermedia offers several options with its TV Box range. The TV Box 3 model (£99 inc VAT) has an analogue TV tuner, composite and S-video inputs, along with an infra-red remote control and VGA output to a PC monitor. The top-end TV Box 9 has similar features and can also scale to 1,280 x 1,024 resolution, support picture-in-picture and has a component video input for £129 inc VAT.

Avermedia has also recently launched a DVB-T digital terrestrial TV tuner box, which again features a VGA output for connection to a PC monitor. Sadly, though, it has no external inputs for composite or S-video sources. See www.avermedia.co.uk for more information and Media Atlantic at www.mediaatlantic.com for sales.

Disk enclosures

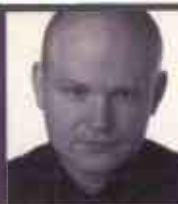
Finally, to wrap up this month's Hardware column, a quick word on another popular enquiry: storage and backup. Many people are fast realising that the only medium suitable for backing up large collections of photos, videos and music is another hard disk. External hard disks offer an ideal combination of capacity, speed and portability, but pre-assembled models are often quite expensive.

An affordable alternative is to buy a standard internal 3.5in IDE hard disk and fit it inside an enclosure box. These feature external connectivity such as USB2 and normally come with a power adapter.

While portable disk enclosures are most commonly found at various computer fairs, a number of specialist suppliers are now stocking them. Kustom PCs offers a USB2 hard disk enclosure for a reasonable £43.01 (inc VAT), which will accommodate any 3.5in IDE hard disk. It's ideal for those times when rewritable CDs or DVDs just don't have sufficient space for your needs. Visit www.kustompcs.co.uk for more information.

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

Take it to the limit

We've tackled the theory of overclocking, now we see how well it works in practice

In last month's column we looked at the theory behind overclocking processors and the various issues you should take into consideration. As a brief recap, most processors have fixed clock multipliers, so the easiest way to overclock them is to simply increase the motherboard's front-side bus (FSB) speed.

Take a 2.4GHz processor designed for a 100MHz FSB, for example. This processor employs a fixed 24-times clock multiplier. This means increasing its FSB to 105MHz would force it to run at 24 times 105 or 2.52GHz, giving you an extra 120MHz for free.

If this sounds easy, you're not far wrong but there are important limits you need to be aware of. For example, you can't just keep increasing the FSB and expect the processor to play ball. Beyond the FSB's impact on other components, all processors have their own limits, past which they'll become unstable or simply prevent the PC from starting at all.

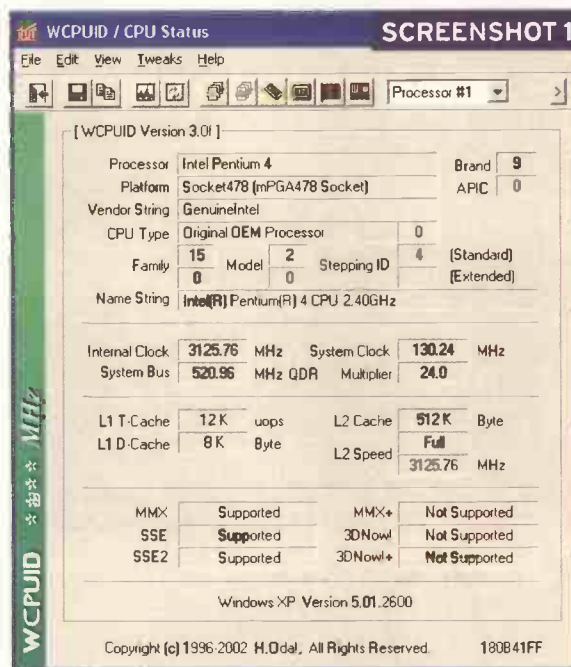
If this happens you'll need to return the FSB setting to the speed where the system last worked reliably. If the FSB adjustment is from the Bios setup page and you're locked out by a frozen system, you'll need to reset the CMOS settings and re-enter them as if the motherboard were brand new.

As we explained last month, slightly increasing the core voltage supply to the processor may allow it to run stably at higher frequencies, but there'll still be a limit beyond which it won't work. The ultimate question for overclockers, therefore, is how far can you push a processor?

Overclocking limits

The only way to know for sure how far your particular processor can be overclocked is to steadily push it until it becomes unstable. Some chips simply overclock better than others, even if they were made in the same factory with the same materials and techniques.

For a scientific estimate, though, you should find out what manufacturing process was used to produce your processor. This is measured in microns, or more recently nanometres. It can normally be found in datasheets on



Evidence of our 2.4GHz Pentium 4 overclocked to 3.125GHz using an FSB of 130MHz. The system ran stably when overclocked at a slightly lower speed of 3GHz

the chip manufacturer's website. Finer manufacturing processes support higher clock speeds but each has a limit for reliable operation. As clock speeds approach this limit, manufacturers switch to a finer process to produce faster chips.

Companies don't reveal the maximum reliable clock speed of each manufacturing process, but a conservative giveaway is the point at which one process is switched for a new one.

For example, Intel's 0.13micron process was introduced with the Pentium 2A running at 2GHz. At the time of writing this was being used to produce 3.4GHz processors. Revealingly, though, Intel's latest 90nanometre (0.09micron) process was introduced with new Pentium 4s running at 3.2GHz.

While a finer process crucially allows a manufacturer to increase its yield, I'd say this switch is an indication that the 0.13micron process is approaching its maximum reliable speed.

Admittedly, extreme enthusiasts have overclocked 0.13micron Pentium 4s beyond 4GHz but, under normal circumstances, 0.13micron processors running above 3GHz are close to their limits. Conversely, 0.13micron processors running at, say, 2.4GHz should have plenty of overclocking potential.

Put to the test

To test this theory we put together a system using a 2.4GHz Pentium 4 processor, an Asus P4B266-E motherboard and 256MB of DDR 2100 memory. The processor was the 2.4A model designed to run on a 100MHz FSB with a fixed clock-multiplier of 24-times.

Overclocking processors causes them to run hotter, especially if higher core voltages are applied for stability. Consequently, superior cooling is required. In future columns we'll look at the benefits of exotic liquid cooling systems, but for this experiment we simply used a high-quality Alpha heatsink and a Delta fan, both from Overclockers UK.

When clocked normally at 2.4GHz, the system scored 222 in Sysmark 2002. By increasing the FSB to 105MHz, the processor was forced to run at 2.52GHz, at which point it scored 230. Upping the FSB to 110MHz caused the system to become unstable until we increased the core voltage from 1.5v to 1.65v. With the extra juice, the processor clocked at 2.64GHz, scoring 238. This voltage also supported an FSB of 115MHz and a processor clock of 2.76GHz, although the Sysmark score didn't change.

Increasing the voltage to the motherboard's maximum of 1.75v allowed the chip to be clocked at 2.88GHz, scoring 245, then at 3GHz scoring 252. The fastest we managed to clock it was with an FSB of 130MHz and a clock of 3.125GHz (see screenshot 1), although Sysmark wouldn't run reliably.

Your own results may vary, but most 0.13micron processors officially clocked below 2.8GHz should support speeds at least 10 to 20 per cent faster with decent air-cooling. Models closer to 2GHz might even enjoy increases of 25 to 33 per cent.

As always, any overclocking is undertaken entirely at your own risk, but those willing to do so should enjoy at least a 10 per cent performance boost for free.

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

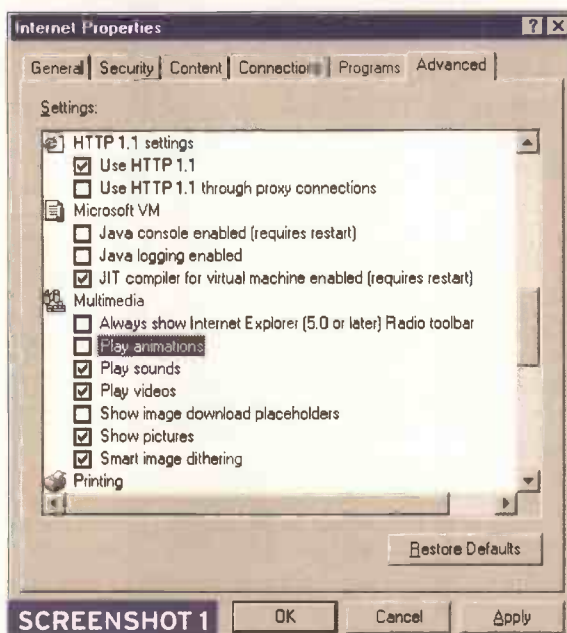
Readers to the rescue

A helpful hint on trashing Flash animations, a useful chk utility, nicknames and more

I'm as much a fan of animation as anyone. *Tom & Jerry*, *South Park* and *Shrek* all amuse my simple mind. What I'm not so keen on is animations on websites. Not, I hasten to add, the ones that have some informational purpose, such as showing the path of an eclipse or how things work, but the adverts and banners that cavort distractingly at you when you are trying to read a page of text. *The Guardian's* website is a particularly glaring offender – it's like having large insects crawling around the screen. Internet Explorer, like most browsers, has an option to disable the playing of animations – you'll find it under Tools, Internet Options, Advanced, Multimedia (see screenshot 1). However, this only works with gif animations: if the page contains Flash animations, these will continue to play. So, it was with great joy that I discovered Flash and Pics Control, from <http://unhsolutions.com/FPC>. This simple piece of freeware adds a button to the IE toolbar enabling you to turn off Flash animation, and/or all pictures. My eyeballs are already profoundly grateful, and if I could find a way to get the Opera browser to freeze Flash without disabling all plug-ins, I'd be even happier.

CHK, mate

I've always taken the view that the chk files recovered by Scandisk after a bad shutdown or other disk mishap are fairly useless. I have occasionally found some lost text in a chk file, but otherwise I've just deleted them to free up space. So I was interested to discover Eric Phelps' Unchk utility, which you'll find at www.ericphelps.com/uncheck. This is a model of simplicity. Drag the chk file on to the program's icon and it will try to make a copy of that file, and any other chk file in the same folder, with what it guesses to be the correct extension. Surprisingly enough it works – having tried it out on some leftover chk files it managed to turn two of them into fully functioning HTML. And as the originals must have been in my browser cache, I can now share with you the fact that DJ Irwin played Rabbit Hop by Moondog's Honking Geese on Radio WFMU on 18 February this

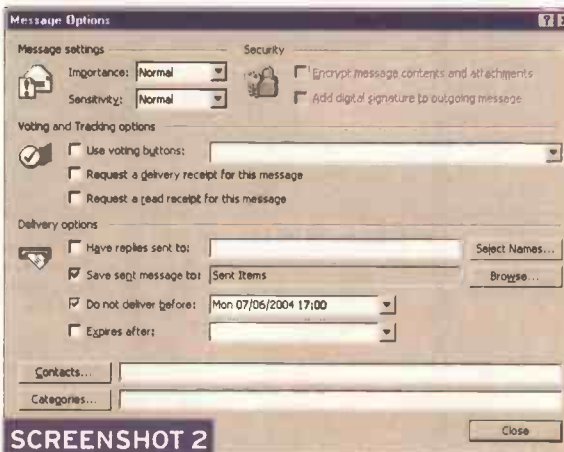
**SCREENSHOT 1**

Turn off those irritating animated gifs

year. Eric claims that Unchk will recover 27 file types 'out the box' and can be taught to recognise others. It can recover embedded files – such as images stored in a document – and can recover cross-linked files.

The web page contains some interesting observations on data recovery in general: 'If you can't see partial files and you have more than a few fragments in a file, you are on the wrong side of a big factorial. There will be nothing but neutrons and black holes in the universe by the time you get anything recovered.' Unchk is free, as is a rival utility, Filechk, which you can also download from Eric's site.

Send that message next week

**SCREENSHOT 2**

Preserved dates

In July's column, I threw out the challenge of preserving the creation dates of folders when copying them. Replies have poured in. Rob White suggested Winrar, which 'captures and recreates the whole hierarchy with dates, attributes, [and] everything.' You can get a trial version at www.rarlab.com. In much the same vein, David Shephard suggests Winzip 6.3.

Peter Grainge suggested Attribute Changer, which you can get from <http://webplaza.pt.lu/~rpetges>. This 'can be set to recurse subfolders as well. That would of course mean your entered date and time would apply to all folders and files with the selected attributes and that may not suit your needs'. Bill Martin, in an admirable piece of cheating, retained the original folder creation date by changing the system date to the folder date before copying it. This obviously won't be suitable if you have nested, differently dated folders and want to preserve all the dates.

Geoff Cooper recommends Total Commander from www.ghisler.com, which he describes as a 'a real one-disk wonder for less than £25'. Finally, joker of the pack Michael York suggested 'booting into Linux with a TOMSRTBT floppy and use the cp command with the -R -p options. Or is this the wrong answer for your column?' To which the answer is 'probably', but I'll mention it anyway.

Outlook nicknames

June's observations on Outlook produced a fair amount of feedback. Although unlike Outlook Express, Outlook isn't a part of Windows, there seems to be considerable reader interest and, as we don't have a Hands on column that explicitly covers Outlook, I'll devote a little space to it here. Both Ian Wall, who has been reading PCW for 'at least 20 years', and Simon Smillie point out that Microsoft has released a tool for repairing a corrupt nickname list for some versions of Outlook. If you look up Microsoft Knowledgebase article 242074 you'll find links to download this: there are separate versions for Outlook 2000 and Outlook 97/98.

Richard Quadling points out that you can address the other problem mentioned – that of colour-coding appointments by, for example, name

– by using the Automatic Formatting option in View, Current View, Customise Current View. Unfortunately to get this working properly you need Outlook 2003, which in turn requires Windows 2000 or XP, which in turn is definitely outside the scope of this column. With Outlook 2000 the Automatic Formatting option is not available for the normal calendar views, though you can use it to display different colour fonts in the ‘Active Appointments’ list and other views that are table-based.

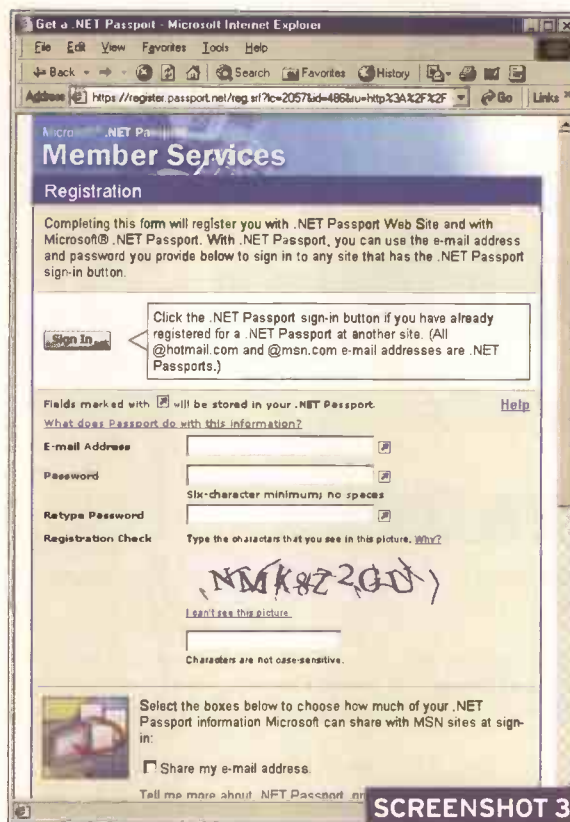
Regular correspondent Vivian Dunn wanted to know if it was possible to flag mail messages with different colours in Outlook 2000 or 2002. According to Vivian, this is possible in Outlook 97 and Outlook 2003, but 2000 and 2002 just offer red. In Outlook 2000 you can get a white flag by first flagging for follow-up, to get a red flag, then right-clicking and choosing 'Flag Complete'. The Automatic Formatting option, however, does work in mail folders, so you can change the font and colour of inbox items according to sender, subject and so on.

Ian Wilkins is a reader who plans ahead. He types a lot of emails that do not have to be sent for days or weeks in advance. These he stores in the Draft folder, which he then has to go through manually to see which have to be sent on that particular day. He asked if there is any way an email can be automatically transferred to the Outbox on the day it is due to be sent? Failing that is it possible to hold it in the Outbox with a delayed sending date attached?

The last is possible – in the window in which you are typing the message, click the Options button on the main toolbar. Here you'll see an option to 'Do not deliver before...'. You can select a date from a pop-up calendar, but if you want to specify a time other than the suggested one, you need to edit the latter manually. Close the options box. When you've finished the message, 'Send' will consign it to the Outbox, where it will remain until the appointed date and time (see screenshot 2).

Updates updated

In May's column, we dealt with keeping copies of Windows Updates to install (or reinstall) on other PCs and versions of Windows. There's another alternative which may be more attractive to those with slow Internet connections. If you ask nicely, Microsoft will send you a CD free of charge. On the plus side, this



SCREENSHOT 3

gives you security updates for Windows 98, ME, 2000 and XP. On the minus side, it only goes up to October 2003, so you'll still need to do some downloading. You'll need a .Net Passport (see below) and you'll find the ordering information at www.microsoft.com/uk/security/protect/update.mspx.

So, what is a .Net Passport? Is this part of Microsoft's battle for world domination? Will it, as with ID cards, become compulsory to have one? And does it involve giving Microsoft confidential information? The answer to the first question is yes – Microsoft wants you to have a .Net Passport for similar reasons that shops want you to have loyalty cards. However Microsoft has lowered its ambitions since the scheme was launched. Originally you could opt for a 'Passport Wallet' for making online purchases at participating sites, but this was discontinued in March 2003, and replaced by an 'MSN Wallet'. So, you can still have a Passport and you can still have a Wallet, but like any sensible traveller you don't have to keep them in the same place.

Last year, there were reported security problems with Passport and the scheme also fell foul of EU regulations. Microsoft has also discontinued its directory of participating sites without giving a reason, so we'll leave it up to the

Signing up for a .Net Passport

reader to wonder if it was because the list had become unmanageably large or embarrassingly small.

As for the second question – well, let's hope not. But as we see above, if you want, for example, the Security Update CD, you'll need a .Net Passport. And you'll be able to sign in at any participating site using the same username and password. So, how do you go about getting one? First, you may already have one. If you have an MSN or Hotmail email account, then your email address and password can be used to sign in at any Passport-demanding site. Failing that you can register at, or be redirected to, the .Net Passport website at www.passport.net/Consumer/Default.asp.

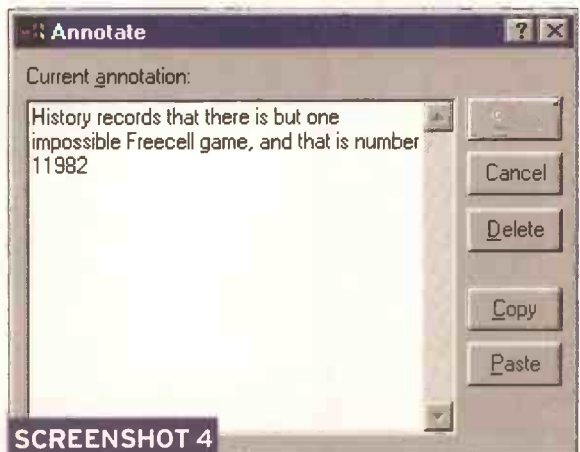
Which brings us neatly to the third question. To sign up, you need to supply a valid email address and choose a password. There's a check box to share your email address with MSN sites (optional) and that's it (see screenshot 3). You can then create a profile with your real (or imagined) name, sex and age, but this is entirely optional. And if you're really at a loose end you can read several pages of privacy statements.

Faves from the grave

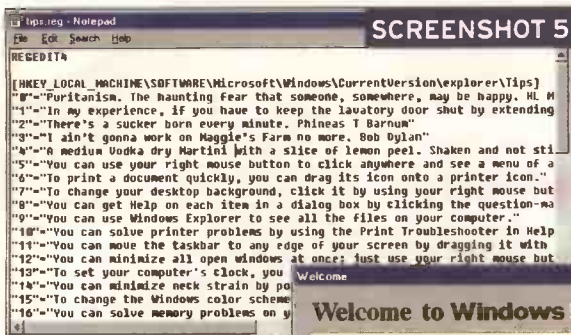
Is anyone out there still using Windows 95? If so, there are a couple of things you can do that are not possible in later versions. First, you can add your own annotations to the Help files. Right-click in the Help text (or go to the Options menu) then choose 'Annotate'. A box will appear ready for you to type in your own text – when you save this a marker appears in the Help text. Double-click on the marker to show the annotation. You can have one annotation per page of a help file, and they are stored in a file with the .ann extension (see screenshot 4).

The other fun thing you can do with Windows 95 is edit the tips that

One for Windows
95 users



SCREENSHOT 4



SCREENSHOT 5

appear in the Welcome screen. First, if you sent the Welcome screen packing long ago you can get it back with Start, Run, Welcome.exe. Then you will be able to tick the option to show the screen when Windows starts. As for customising the tips, this requires a little Registry editing. Rather than do this in situ, an easier way is to work on an exported Registry file. So Start, Run, Regedit.exe, and navigate to HKEY_LOCAL_MACHINE \SOFTWARE \Microsoft \Windows \CurrentVersion \explorer \Tips. With the Tips key selected go to the Registry menu and 'Export Registry File'. Save this with the name of your choice to the location of your choice, making sure that the 'Selected branch' option is checked. Close Regedit, then right-click on the .reg file you have just created and choose Edit. The file will open in Notepad, and you can substitute your own text for that between each pair of double quotes. Don't mess with the numbers or add any line breaks (see screenshot 5).

When you've finished, save and close the file, then right-click on its icon and choose Merge. This will save it back into the Registry, and you will see the new tips next time the Welcome screen appears (see screenshot 6). If you are testing your changes and want to jump to a particular tip number, you don't have to wade through them all. Go to the corresponding Tips key in the HKEY_CURRENT_USER branch of the Registry and change the 'Next' binary value to suit. Bear in mind that this is in hexadecimal.

Moving onward in time to Windows 98 Second Edition, which judging from your feedback is still very widely used, this has an even more bizarre Help feature, which you will also find in later versions. If you right-click in the Help text, you get an option to 'View Source'. This opens the current help page as HTML in Notepad. Why anyone would want to do this is a mystery, as the

immediately attractive idea of using this to annotate or edit the Help files is a non-starter. What you get in Notepad is an HTML file in the Temporary Internet Files folder. You can edit this to your heart's content, but it won't make any difference to the original Help file – these are in compiled HTML (.chm) format and

can't be edited by the end user. You can, of course, save the temporary HTML file elsewhere and edit the content, but it won't be linked to the rest of the help system. If you fancy having a go

at writing your own CHM help files, then you can download the Microsoft HTML Help Workshop from <http://go.microsoft.com/fwlink/?LinkId=14188>.

Another limit of Windows 98 and ME help is that you no longer have the option to change the font size. There is a workaround, of sorts, in that if you open Internet Explorer, then change the Text Size from the View menu, the change will trickle through the next time you open a help file. However, this only affects the right-hand pane – the indices and lists on the left stay the same size – and, of course, applies to IE browsing as well.

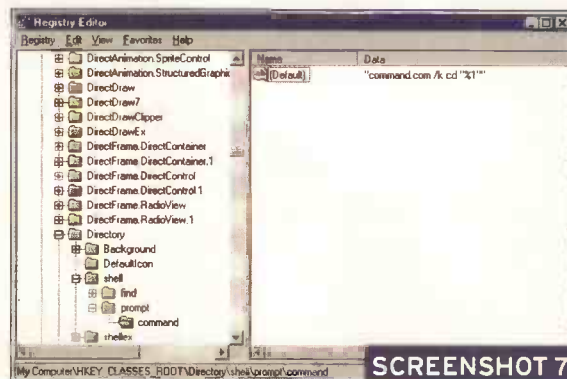
Helpful hints

Looking at help on a much smaller scale, there's a trick you can use to add a description to a folder – this will pop up when you hover the mouse pointer over it, or you'll see it in the preview area of Explorer in Web View, much as the standard Windows special folders. In the target folder, create a new text file and add the following two lines:

```
[.ShellClassInfo]
InfoTip=Whatever ever
you want to appear
```

(Key: ✓ code string continues)

Make your own Powertoy



SCREENSHOT 7

Save this as Desktop.ini. Now start a command prompt and navigate to the folder containing the target folder. Set the target's system attribute:

```
Attrib +s "My target
folder"
```

You'll only need the quotes if the folder name has spaces. Next time you open Explorer or the containing folder you should see your pop-up description.

Command prompt?

Having casually typed 'navigate to the folder' in that last paragraph, I remembered that the original set of Windows 95 Powertoys contained a useful gadget to let you open a command prompt directly 'in' a folder from a right-click. This obviates the tedious business of using the CD command and having to type your way down through long chains of folders. The star Powertoy, TweakUI, had its non-XP version updated and can be found at www.microsoft.com/networkstation/downloads/powertoys/networking/nttweakui.asp. However, the rest of the original Powertoys appear to have been thrown out of the pram. Some of these – such as the Cab viewer – have since become part of Windows, and others, such as the circular clock, have long lost their novelty value. But the 'Command Prompt Here' toy – which, incidentally, is available as an XP Powertoy – is sadly missed. It's not too hard to roll your own with a little Registry editing, though.

First, take the backup precautions appropriate to your version of Windows, then run Regedit and go to HKEY_CLASSES_ROOT \Directory \shell. Create a new key under this, and call it 'prompt'. Regedit will automatically create a blank Default string value. Double-click on it and type in the text you want to see in the right-click menu, for example, 'Open command prompt'. Next, create another key called 'command' under the 'prompt' key. Note that you can call the 'prompt' key by another name, but 'command' is mandatory. Set the default value of the 'command' key to 'command.com /k cd "%1"'. As usual, none of these names and values should include the single quotes, but you'll need the double quotes in that last value (see screenshot 7).

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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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

Starter's orders

How to adapt your XP Start Menu to suit your needs, and a Clipbook conundrum

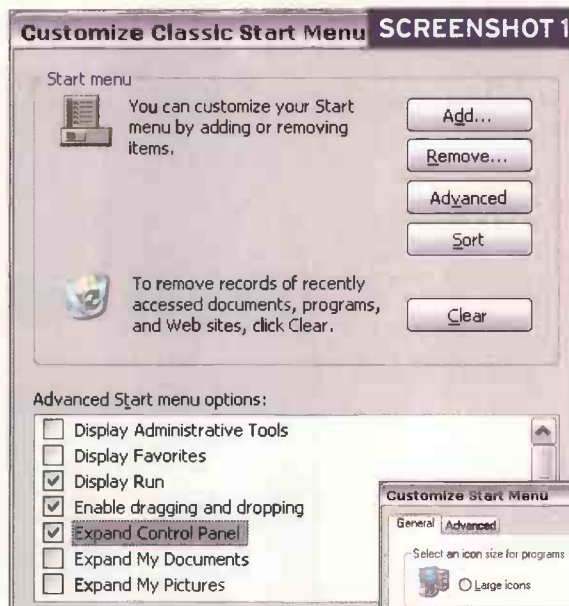
In recent columns we've dealt with paging files, the command prompt and multiple booting.

This month we're going to concentrate on something less esoteric. For many users the XP Start Menu is 'just there' but, with a little effort, you can get it just the way you want it. The first thing to do is get toolled up – there's quite a bit you can do with the basic options but, if you really want to hit the metal, you need TweakUI for XP. Point your browser at www.microsoft.com/windowsxp/pro/downloads/powertoys.asp and download TweakUI.exe. There are two versions – one for Itanium systems and another for the rest of us – so make sure you get the correct one.

Once downloaded, you'll have a file named TweakUIPowerToySetup.exe (or TweakUIPowerToySetup_x64.exe for the Itanium version). Make sure you have uninstalled any older (pre-XP) versions of TweakUI, then run the exe file to install the XP version. Unlike the earlier versions of TweakUI, this installs as a program in the Start Menu rather than an item in Control Panel. If you've got PCW's August 2003 XP column, you'll find full instructions for restoring TweakUI to its traditional seat in Control Panel.

Now we're ready to go. If you right-click on the Start button and choose Properties, you'll see you have a two-tab dialogue covering the Start menu and the Taskbar. Taking the former, you have two main options: (XP) Start menu or Classic Start menu. This choice is independent of whether you are using the XP visual themes – you can have a traditional Start Menu with the Luna (aka Teletubbies) theme or the 'classic' Windows look with the functionality of the XP Start menu.

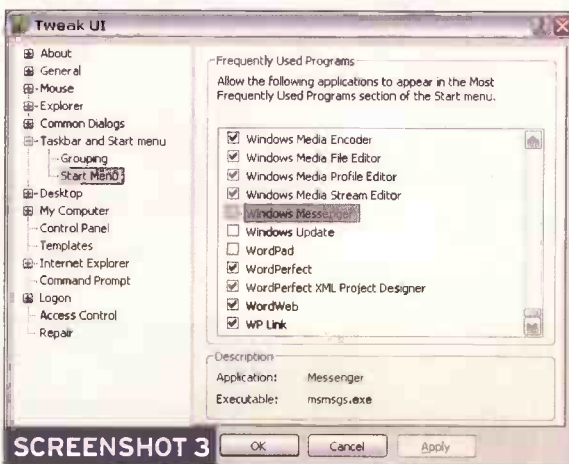
Each menu style has its own set of sub-options. Taking the classic style first, the Customize button lets you add and remove items, or go to 'Advanced', which is the same as opening the Start menu in Explorer. You have an button to clear the most recently used (MRU) lists in the Start menu, such as commands typed in the Run box, and the contents of the Documents list. Then you have a number of options to display or hide certain items, to enable dragging and dropping within the Start menu, and to expand certain items such as Control Panel and My Documents. If you elect to expand one of these it



Top: Show Control Panel as a menu on the classic start menu

Right: Setting the limit to the most frequently used list

Below: TweakUI bans programs from the MFU list



SCREENSHOT 3

you find both options annoying, you can rearrange the Start menu into subfolders containing fewer items. Show Small Icons is another Windows tradition. Tick this if you like Big Icons at the first level of the Start menu and the cool 1990s side-panel showing you the version of Windows. Finally, you have the Personalized Menus option. This hides Start menu shortcuts to programs on the basis of recent use, making it harder to find anything you haven't used for a while. Some people like this – but there's no accounting for taste. You can manage the Start menu better by rearranging it manually.

Having said this, the XP-style Start menu makes a far better stab at a smart start as, rather than hiding infrequently used programs, it promotes those frequently used. Unlike the classic Start menu, the XP menu is initially displayed in two columns. On the right is all the standard stuff – Search, Run, Documents, Help,

Settings and so on. As with the classic Start menu, you have the option to hide most of these and, where applicable, have them launch a sub-menu or open a separate folder. The log-off and turn-off commands are tucked away into their own panel at the bottom, and the left column is split into two sections. At the top is the normal A-list – as with Windows 95 onward, you can drag or create shortcuts here in Explorer or, with the drag-and-drop option active, drag shortcuts from lower down the menu. This can be tricky, and in XP there is a much easier way: right-click on any shortcut, anywhere, and choose 'Pin to start menu'.

Beneath this is the clever bit. Windows adds shortcuts to the most frequently used programs, promoting copies of shortcuts from deeper down the menus. You can set a limit to the number of items here, and when that is reached older items will be replaced by newer. You can have up to 30 shortcuts in the MFU list, though that many would rather miss the point. On the same dialogue (Start Menu, Start



SCREENSHOT 4

Menu, Customize, General), you get the option to put your choice of email and browser programs on the A-list, or clear the MFU list completely (see screenshot 2).

XP is fairly smart about what it adds to the list – it won't, for example, duplicate items that are already pinned above, or add items you've started from the Quicklaunch toolbar. You can remove individual shortcuts from the MFU list by right-clicking on them. But, of course, this won't stop them returning. And this is where TweakUI comes in. Under Taskbar and Start Menu – Start Menu, you'll find a list of all your programs. Unticking the box beside any program will ban it permanently from the MFU list (see screenshot 3).

Clips and tips

Further to July's Question time answer to the whereabouts of the XP Clipbook viewer, I've had a query from Ron Raine, who says he can't save the Clipboard contents to the Clipbook. 'The help contents tell me to click on the Window menu and then click Local Clipbook. My Window menu does not show a Local Clipbook item.' And, strangely enough, nor does mine. After asking around, this seems to be the rule. Not only that, but the Share and Connect commands on the File menu are greyed out, as are all items on the Security menu. The general opinion seems to be that this is how the XP Clipbook is – broken. If, by a long shot, anybody has got it to work, your input would be warmly welcomed (see screenshot 4).

Reader Rob Saville came up with 'something I discovered recently that had been bugging me for ages'. Start, Run, (or a shortcut to) devmgmt.msc gets straight to Device Manager

without all the clicking through System Properties. Further to our command prompt-athon in July's column, Matthew Wilson points out that the Doskey utility can, in fact, be used in Insert rather than Overtyping mode by invoking it with the '/insert' switch. Matthew reckons this works all the way back to MS-Dos 5, but I have only verified this back to Windows 3.1/MS-Dos 6.2.

Endnote

It never ceases to amaze me how badly things are designed. Remember LPs? Fragile and prone to dust and scratches though they might be, they came packaged in a sturdy cardboard sleeve, which had plenty of room for pictures and text about the performers. Then came cassettes. Pictures and sleeve notes were confined to a rapidly deteriorating slip of paper folded into the case. The case itself was designed on the 'one strike' principle. Drop it on the floor once and the hinges break off. CDs improved slightly on the sleeve space but refined the self-destructing aspects of both the paper insert and the casing hinge. And so it is with Windows. I returned from a recent trip

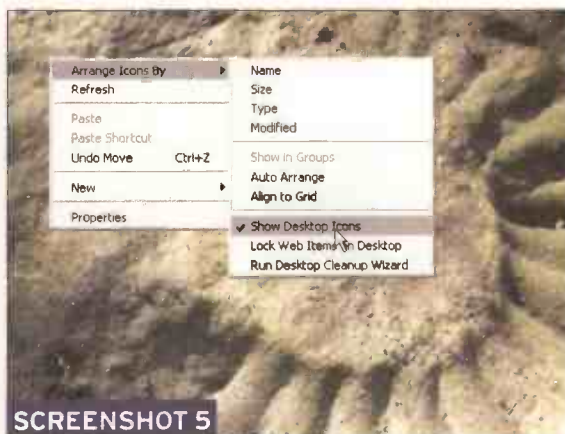
The XP Clipbook – is everybody's broken?

to find that I had no icons on my XP desktop. Normally, it's awash with them – mostly temporary stuff that needs some action on my part before deletion – but suddenly it was like one of those real rosewood but utterly empty desks that only the very rich and powerful have. Checking with Explorer revealed that all the familiar old tat was still in place, but hidden.

Somewhere a faint bell tolled the chimes of 'Active Desktop', and digging around in a Windows 98 installation revealed an option in Display Properties, Settings to 'Hide icons when the desktop is viewed as a web page'. Viewing the desktop as a web page is one of those things one does once, perhaps, before thinking 'why am I doing this?' Over the next half-hour or so, I got to know the XP Pro Display Properties intimately. I even found out how to make windows roll up into their own title bars – but no sign of hiding or showing desktop icons. I was now deranged enough to consider emailing myself at Hands on XP, when it occurred to me that Windows ME might provide a clue or missing link. Again, there was no 'Hide icons...' in Display Properties. But a right-click on the desktop gave me an 'Active Desktop' sub-menu containing three items. 'Customize my desktop' whisked me straight to the Display Properties, Web tab, wherein lies the option to 'Show web content'. 'New Desktop item' cut to the Display Properties, Web, New... dialogue. The last item, 'Show web content', did just that without further dialogue. It also changed its own menu, as a further right-click revealed, from 'Active Desktop' to 'Synchronise', 'Lock desktop items', and – eureka – 'Show desktop icons' (see screenshot 5).

This was a fine bit of bafflement. If the extra menu items were merely greyed out, that might at least give us poor saps a clue that we were getting close, but bad design on this level takes no prisoners. Anyway, heartened by this discovery I dug into the XP desktop menu. No sign of Active Desktop. But I did find the 'Show Desktop Icons' option. It's under 'Arrange Icons By'. Putting the option to arrange things up-menu of the option to see them at all is a shining example of Microsoft's continuing quest for innovation in obfuscation.

Logic takes a back seat



SCREENSHOT 5

CONTACTS

Tim Nott welcomes your comments on the Windows XP column. Email him at: xp@pcw.co.uk. Please do not send unsolicited file attachments.

**Terence Green**

has tussled with computers ever since starting as an IBM mainframe operator in 1979. Since 1981 he has documented the gap between what PCs claim to do and reality

Fighting corruption

Diagnosing and solving a system error, and the problem with security patches

Problem diagnosis in Windows is not always clear cut. It pays to approach it systematically, by a process of elimination. Sometimes the true source of a problem remains a mystery and we are forced to fall back on the traditional Windows problem-solving technique – a reinstall.

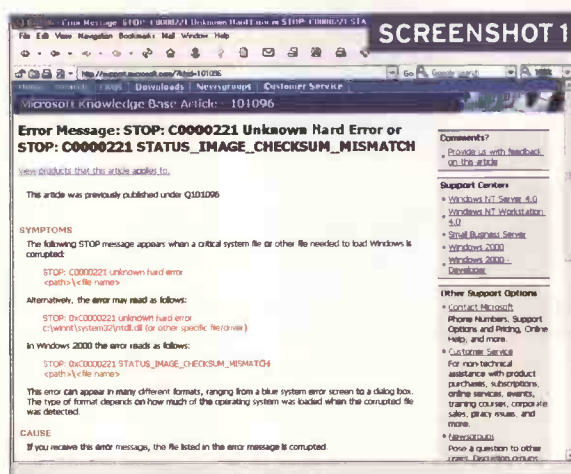
Neal Baldwick wrote to say that he recently started seeing 'Unknown Hard Error' messages after a few minutes on the web. Internet Explorer 6 freezes after the error is reported and Neal has to restart the computer. Upon restarting, CHKDSK runs and makes some alterations to the file system. Then matters proceed normally until the next time he uses Internet Explorer (see screenshot 1).

A Knowledgebase article at <http://support.microsoft.com/?kbid=101096> references this very problem. It ascribes the problem to a corrupted system file, which does fit the facts, but is not definitive because the article also says: 'This error message can be caused when you install an inappropriate driver for your hardware.' It gives a fairly wacky example of an inappropriate driver, but the point is that it raises the possibility that the error may not be due to file corruption or imminent hard drive failure.

In any event, a failing hard drive either fails catastrophically or fairly quickly. Neal reports a single unusable 8KB cluster on the hard disk, but a failing hard drive would report multiple errors and escalating problems over a fairly short period of time. Also, modern hard disks dynamically reallocate space independent of the operating system. It's unusual to even see such errors these days but we cannot be sure as we have no information on the drive, such as its make or age. The Windows 2000 partition is FAT32-formatted and this could be relevant, as NTFS is far more resistant to file corruption.

So, the best guess is that either the hard disk is going south, or a system file required by Internet Explorer has become corrupted. This being Windows, it could be something else entirely, but let's not go there.

Actually, let's, just for a moment. There is at least a possibility that Neal's problem is the result of a virus or worm. It's a possibility that needs



What to do with an Unknown Hard Error

to be taken seriously because the Internet today is literally flooded with malicious spam. We have a test email account that attracts a fair amount of spam each week. We have been counting the number of viruses and worms arriving in spam and it's running at roughly 100 a month. That's only a few per cent of the total spam, but it's a lot of viruses and worms being received month after month.

We're harping on about security again, but viruses, worms, trojans, backdoors and suchlike are relevant to Neal's problem. The error he sees is normally generated when system files are checked at boot time, according to the KB article. If something nasty has crept into the system file folder and is starting up when Windows boots or soon afterwards, that could explain the error message.

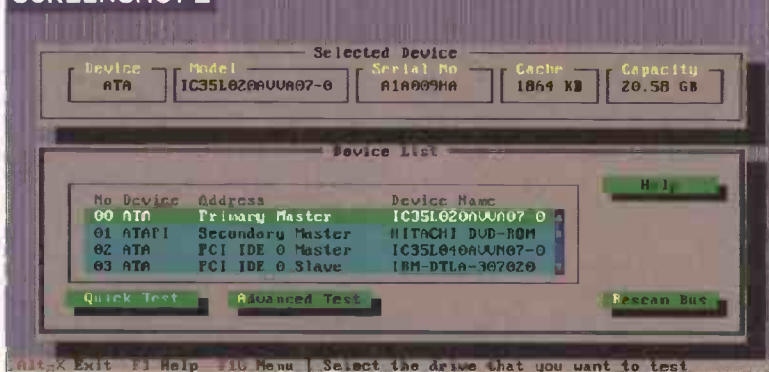
Nowadays the first step, when confronted with startup problems similar to Neal's, should be to check the system for viruses and spyware.

Also, because worms such as Sasser can insinuate themselves into Windows without any action on the user's part, it is not advisable to log on as an administrator for normal daily use of Windows. When you are logged on with administrator rights, any program that runs also has administrative rights, including worms and viruses. If you run as a standard user, the worm or virus can still run on the computer but its options for installing malicious components are limited by the rights of the user account.

Lots of people run as administrator because it's easier – and with some recalcitrant applications it is – but it's also quite a high-risk proposition these days. If you just have one or two programs that will only run under an administrator account, it is far safer to use a standard user account and set up the errant programs to ask for credentials with the 'Run As' command. This is easy to arrange. Create a shortcut to the program executable, right-click on the shortcut, select Properties, and on the Shortcut tab select 'Run as different user'. When you activate the shortcut you'll be presented with the 'Run as other user' password dialogue. Enter the administrator name and password.

Having established that the problem is not virus-related, what next? Neal's 'Unknown Hard Error' is a curious problem, because the symptoms he reports don't quite fit the facts in the KB article. A Google search on the error message is also inconclusive. There are only a few reports and none of them offer any promising alternative leads. In view of this, it is quite possible that the true source of the problem is buried in some obscure entry within the Registry.

SCREENSHOT 2



Testing the integrity of the hard drive



Disk diagnosis

So, we think the problem may be hardware related, such as a hard disk error resulting in a corrupted file, but there is also the possibility that it is a configuration glitch in the Registry. The obvious first step is to eliminate the hard disk as a potential problem source, as this is far easier than searching for a needle in the Registry haystack (see screenshot 2).

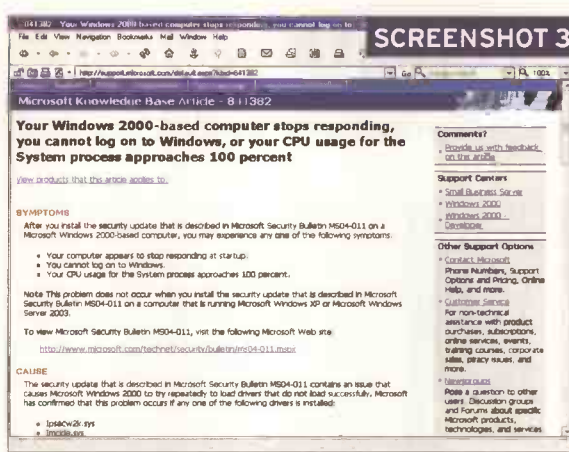
Most hard disk manufacturers provide drive diagnostic tools, which can be downloaded from their websites. If you don't know the make of the hard drive, open Computer Management by right-clicking on the My Computer desktop icon and selecting 'Manage'. Click on 'Device Manager' in the left-hand pane and then expand the Disk Drives entry, which should offer some help in identifying the drive. If you're lucky you'll see the make and model. You may only see the model number, in which case a Google search should provide more detail, enabling you to identify the maker.

If you have difficulty identifying the hard drive, or cannot find the vendor's test tools, download the Drive Fitness Test from Hitachi at www.hitachigst.com/hdd/support/download.htm. This is an excellent drive tester, originally supplied by IBM's hard drive business, which Hitachi bought a few years ago. The Drive Fitness Tester was designed for IBM drives, but is also able to provide basic generic drive testing on other manufacturers' drives.

It is likely that the hard drive, unless it is relatively old, will check out OK. It is also not uncommon for system messages such as 'Unknown Hard Error', which appear to indicate a physical drive problem, to reflect a software or configuration problem. The more common 'Delayed Write Failed' error is another example of a Windows 2000 error message which more often than not indicates a software issue rather than physical drive problems.

It's always worth searching for alternative solutions when faced with a potential hard drive problem. The simple reason for this is that hard drives tend to fail quite quickly with rapidly accumulating errors rather than throwing up one or two errors over an extended period. Incidentally, this is also a good reason to keep reliable backups.

Having established that the hard drive is not at fault, we can proceed to eliminate Internet Explorer, as this triggers the problem in Neal's case. The quickest way to do this is to install a different browser, such as



Opera or Mozilla Firefox. As these browsers do not rely on Internet Explorer code or components, they are a reliable indicator as to whether the problem is specific to Internet Explorer. If it is, it may reflect Registry corruption. This can often be repaired using the Internet Explorer repair process detailed in <http://support.microsoft.com/?id=194177> or the reinstall process described in <http://support.microsoft.com/?id=257249>. If necessary, the Opera or Mozilla Firefox browser can be used to download files.

If repairing Internet Explorer is not possible, or if the alternative browser test absolves IE of blame, the problem is most likely to be caused by a corrupt system file. If so, it may be repaired by installing the latest Service Pack, available on CD from Microsoft UK at www.microsoft.com/uk/windows/service-pack4.aspx. And if that doesn't work, then an In-Place Upgrade will.

File corruption is not uncommon when applications run amok, or when Windows is terminated by pulling the power cord instead of using the shutdown procedure, and worms and viruses often corrupt files too. It is significant that Neal's drive is formatted with the FAT32 file system. NTFS is highly recommended as it is far less likely to suffer from file corruption problems.

KB835732 and Sasser

Last month's column discussed problems with April's KB835732 critical security update, which caused many people to decide against installing it. Two weeks after KB835732 was released, the Sasser worm arrived, to exploit one of the 10 vulnerabilities that KB835732 was intended to fix. Many people had by this time either removed KB835732 or decided against installing it. This was unfortunate, as most of the problems caused by KB835732 were

unrelated to the specific fix for the vulnerability exploited by Sasser. Some of the problems caused by KB835732 have now been positively identified and are detailed in the Knowledgebase article at

<http://support.microsoft.com/?id=835732> (see screenshot 3).

Obviously, this situation may well happen again. Windows has more holes than you can shake a stick at, and patches are being bundled in ever larger 'packages' in an effort to reduce the number of updates that need to be applied.

This begs the question as to what we can do in a situation where a patch is urgently needed to fix a hole, but is known to derange some other unrelated activity. Fortunately, patches are not the only available preventative measures. Nearly all Microsoft security patches include a section detailing workarounds and, in most cases thus far, a properly configured firewall is an effective preventative measure.

Ideally, a firewall should be a separate device, often called a router or gateway, inserted between a computer or network and the Internet. Personal firewall software is an adequate defence – see the group test in the April issue of PCW or look at www.pcw.co.uk/Products/Software/1153293 – but a hardware box is better. The Firewall Guide at www.firewallguide.com/hardware.htm is a little out of date, but does explain the difference between software and hardware firewalls and has other useful information too. It's worth thinking about even if you only have a single computer to defend, as some budget routers cost less than £50.

One final observation arising from KB835732 is that some were unable to install it properly. This was because their Netmeeting folder either didn't exist or was not located in the default Program Files location. All of us, at one time or another, look for reasons to delete files that appear to be unnecessary. However, this isn't always a good idea. In this case, the absence of Netmeeting files, even though almost nobody uses them, affected the installation of a crucial security patch at a very critical time because the patch installer assumed the presence of certain files in a specific place.

CONTACTS

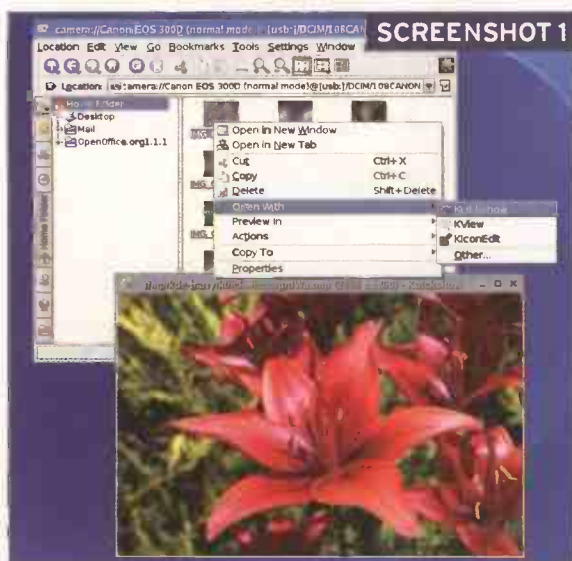
Terence Green welcomes your comments on the Windows 2000 column. Email him at: win2000@pcw.co.uk. Please do not send unsolicited file attachments.

**Barry Shilliday**

has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time prefers to travel the world – and snap it with his camera

Conquer your camera

Using Konqueror to access digital photos, and getting to grips with the startup procedure



Above: You can view, delete and copy the images like regular files

In last month's column we saw how to manipulate digital cameras using libphoto2, a back-end software library developed entirely for that purpose, and gphoto2, its command-line, front-end utility. Gphoto2 can download and delete images and thumbnails, as well as obtain useful information about the images stored on the camera. This front end is especially useful for quickly extracting all files from the camera, or checking that the camera is recognised and working correctly. For more day-to-day use, however, a graphical front end makes much more sense.

If you're using the KDE desktop, you probably have what you need to access the camera straight away. The KDE graphics package comes with a plug-in that enables Konqueror (the multipurpose KDE browser) to browse digital camera images just like a normal filesystem. This includes the ability to copy and delete images. It acts as just another front end to libphoto2, meaning the command-line utility isn't required (see screenshot 1).

Checking the camera is recognised by KDE is easy enough. Load up the Control Centre, go to the Peripherals tab and find the digital camera option (see screenshot 2). The applet shows an icon for the detected camera, and right-clicking on the icon brings up a menu of a few options. You can perform a simple test, change a few configuration

settings, and find out the power status, the amount of space on the camera's memory card, and so on. If the camera isn't present, check that libphoto2 is installed, and that the camera is, of course, switched on (and not in standby). Also, see last month's column for more troubleshooting possibilities provided by the gphoto2 command-line interface.

Accessing the camera's photos through Konqueror is just like accessing regular files. A new protocol called 'camera:' is used, and it works in the same way as the usual file:, ftp: and http: protocols you use all the time. Konqueror doesn't need to know that it's getting its files from a camera, and all the common actions, such as copying, deleting and viewing menus, work normally. Load up Konqueror (click on the Home icon or menu) and in the location bar enter 'camera:/' (see screenshot 3). Assuming everything is in order, a folder icon appears to represent the detected camera. Now just double-click to descend – you may have a couple of extra folders to go through, depending on the camera model (see screenshot 4).

If you only see default icons instead of thumbnail images, it's probably because Konqueror hasn't been set to show preview images on the camera: protocol, or the file size is too large – the default is to preview files below 1MB in size. It's easy to fix this. Go to the Settings menu and select 'Configure Konqueror'. Click on the 'Previews' icon and ensure that the camera: protocol is selected and the maximum file size is set appropriately; if the file size is too low, smaller images are previewed while larger ones are not

(see screenshot 5). Now you can easily download and delete pictures through Konqueror. Next month we'll look at a dedicated KDE application for digital cameras that offers more features and control.

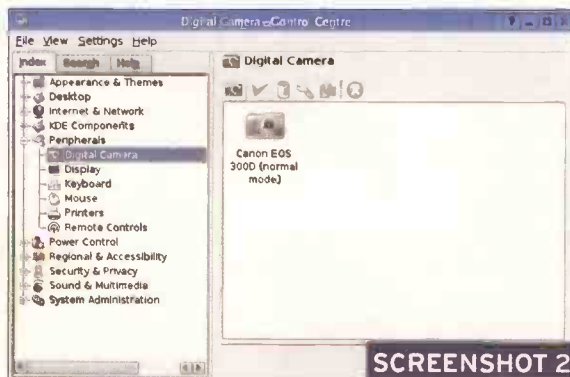
Starting up

What happens when you switch on your computer and boot into Linux? Quite a few things, obviously. There is no 'autoexec.bat' file; a multi-user operating system needs a bit more than that and, while it may be a little complicated, the startup procedure is incredibly flexible. It's possible to separate the startup into various main stages.

First up is everything that happens before the Linux kernel loads, and which is therefore the area outside the kernel's control. On a PC, it involves the system Bios selecting which hard drive to boot. The Bios then executes the code on the first block of data on the hard disk. This is known as the Master Boot Record (MBR), which contains information about the partitions on the disk and enough space for a small executable program. Here, you usually find a piece of code that simply looks for a partition on the drive marked as active and then boots it. Alternatively, you can find a boot loader like Lilo or Grub, which can locate the kernel and start it up. On installation of a Linux system, you're often asked if you want to install the boot loader on the MBR or on the boot sector of the root partition, and this is why. The boot loader can be run from either the MBR directly, or from a partition. It's even possible to load a boot loader from another boot loader – so-called chainloading.

Once the kernel's located, the boot loader starts it up and the CPU begins to execute the code. The kernel initialises just like a simple 16bit PC program – that's why you can boot a kernel straight from a floppy disk without a boot loader; until this point, the Bios has been running the PC. Once it's started, the first thing the kernel does on a PC is to switch into 32bit mode (or 64bit if you're lucky enough to have an AMD64 system) and begin setting itself up. From this point on, the kernel has full control over the PC.

Below: The Control Centre displays any detected digital cameras



SCREENSHOT 2



Kernel initialisation

This next stage involves the kernel detecting and initialising the hardware and preparing to get the system ready for use. On most distributions, lots of information scrolls past the screen as the kernel probes around looking for memory and disks and system buses. If you run the 'dmesg' command, you can see most of this information. The next important step is for the kernel to find and mount the root filesystem – without this available, there's no way to access any files on the disk. If the kernel can't find the root filesystem, or isn't able to mount it, the system freezes with an error – one you've probably seen if you've played a lot with Linux. You might wonder how the kernel knows how to find the root filesystem when it can't yet access any files. There are two methods. Firstly, the kernel has a built-in register of the root filesystem's partition. To change or see this setting, use the rdev command. For example, this command sets the kernel to mount the first primary partition (hda1) as the root filesystem:

```
# rdev /boot/bzImage ✓
/dev/hda1
```

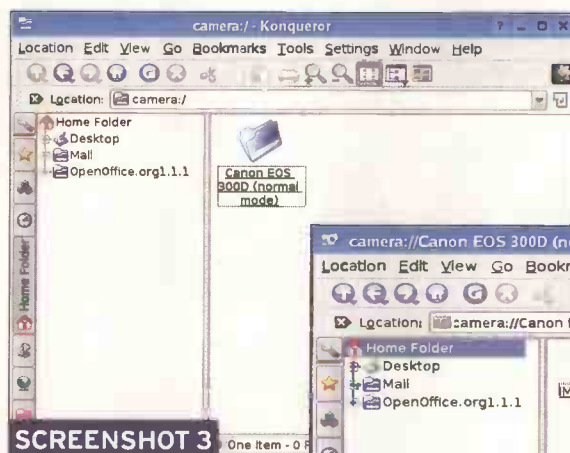
(Key: ✓ code string continues)

The alternative method overrides this setting and can be set on the kernel's command line when booting through Grub or Lilo. The option

'Init is capable of starting up programs directly, but the run-level scripts offer far more flexibility'

'root=/dev/hda3' would cause the kernel to try to mount hda3 as the root filesystem, whatever its own stored value says.

Once the root filesystem is mounted and available, the kernel is finally ready to hand over some control to user programs. Until this point, the system has been running entirely from the kernel itself. In order to start this transition, the kernel runs the 'init' program. If you've followed past Hands on columns, you'll remember the way processes work. As a quick reminder, every process has a unique identification number known as a PID (Process ID). These are allocated sequentially: when a program's run, the kernel allocates the next available PID to the process. When the process ends, the PID is freed up and may eventually be used again by another process. The init program, therefore, always has a PID of 1 and a PPID



(Parent Process ID) of 0; it is the parent of every process and is the one process guaranteed to be running from startup to shutdown.

Init stage

Init is the first process and it's responsible for starting up the system. As above, startup is quite a complex procedure, so init delegates most of the work. It does have a configuration file, however, located at /etc/inittab, and this introduces the concept of run levels.

Linux (as well as Unix) uses run levels to control the startup, shutdown and current state of the system. There are typically six run

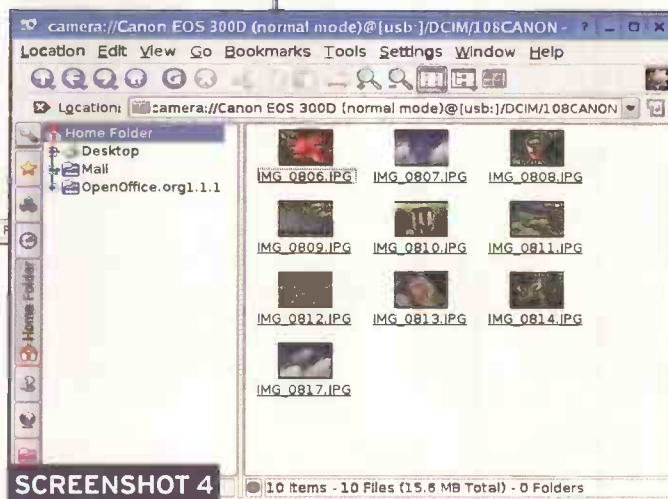
levels: 0 is for shutdown; 1 is single-user mode (an emergency shell access without any running programs or requirement to log in); 2 is a system without any network access; 3 is the fully operational normal state; 4 is user-defined; 5 is fully operational but with a graphical login; and 6 is for rebooting the system. It's the run level that determines which scripts are run from this point, and not the init program. See screenshot 6 for a typical example.

Each entry consists of a two-character identification, the run level the entry applies to and the program init should run. The first entry is a special one to set the default run level. To set this to 5, which is almost always the case for desktop systems, it would read 'id:5:initdefault:'.

The settings here let Konqueror show preview thumbnail images instead of default icons

Left: Browse digital camera files as you would a normal filesystem

Below: Thumbnail images are downloaded from the camera into Konqueror

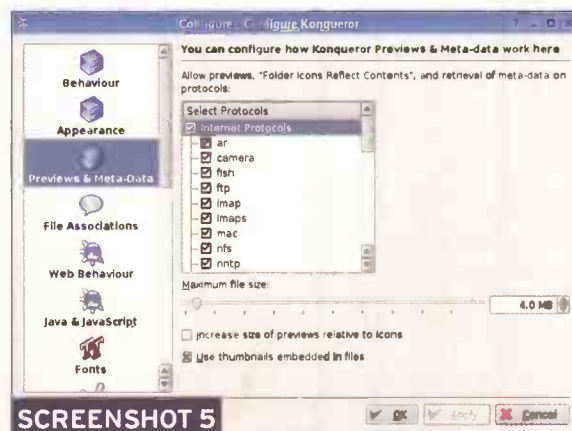


Another special entry reads 'ca:12345:ctrlaltdel:/sbin/shutdown -r now', or something similar. The entry here sets the behaviour on run levels one to five for the Ctrl-Alt-Del keyboard combination. In this instance, the shutdown command is run to reboot the computer immediately (which of course in turn changes the run level). An extra standard entry includes starting up getty processes to provide login shells. Without these, the system would continue to start up according to its run level, but there would be no way to log in. As you can see, init is capable of starting up programs directly, but the run-level scripts offer far more flexibility, and it's these that perform the final stage.

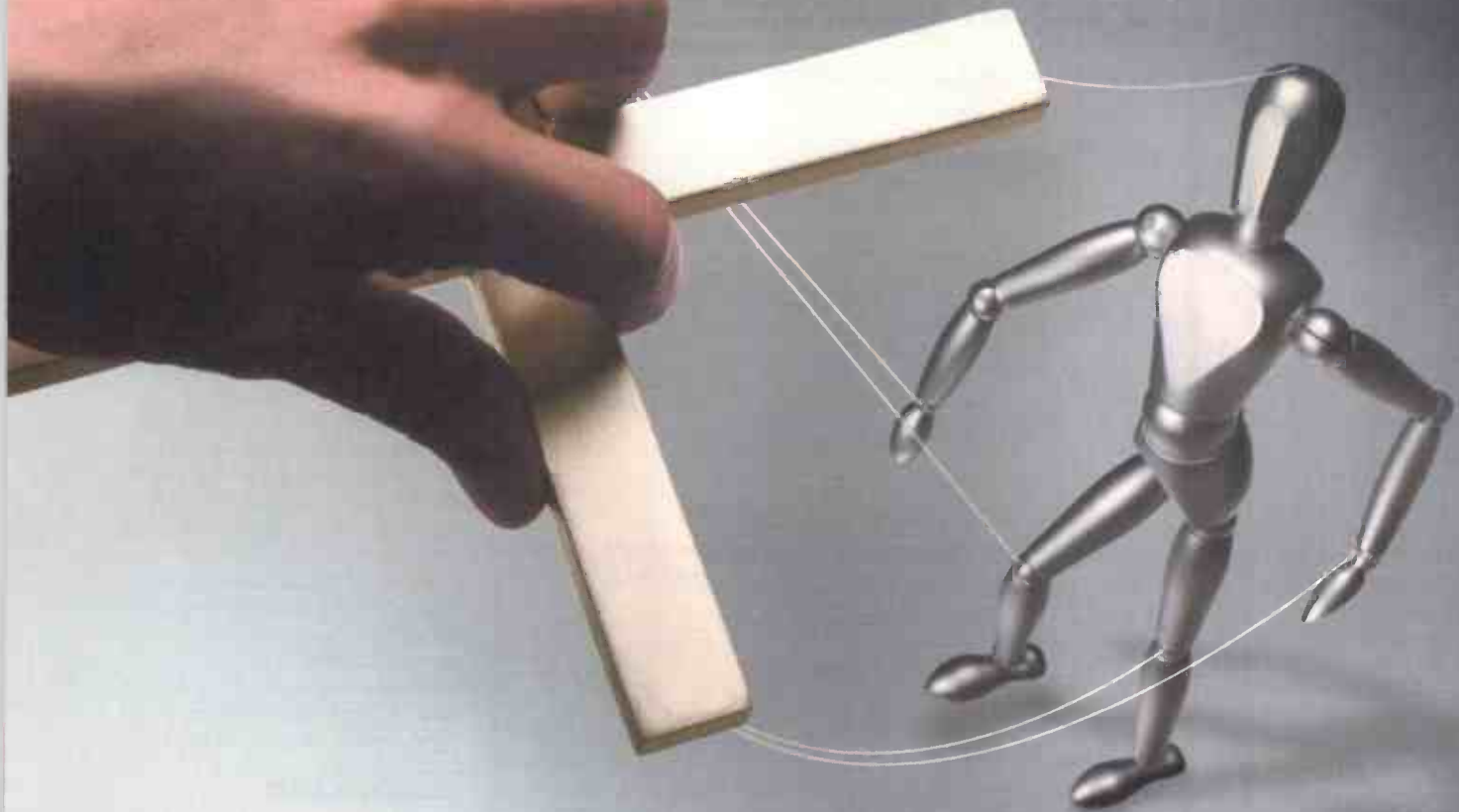
Run level stage

In the inittab there are entries for each run level that read something like:

```
15:5:wait:/etc/init.d/rc 5
```



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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

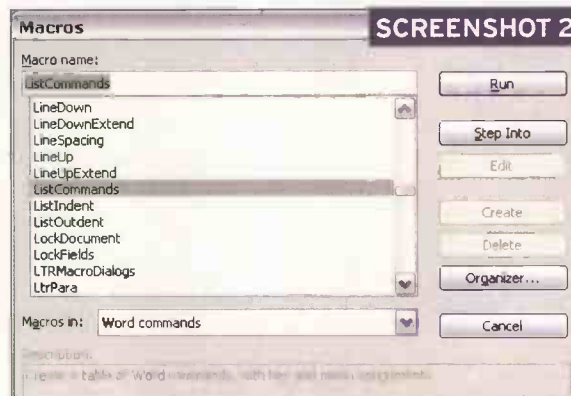
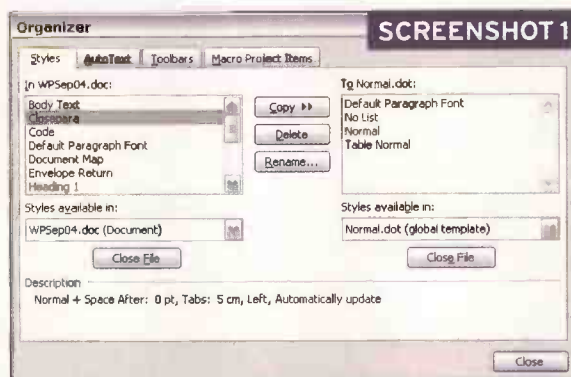
Customise to organise

Personalising the Organizer and key assignments, and a few facts about Julian dates

As Word users will know, the Global Template, Normal.dot, is the repository for the default styles, autotext entries and toolbars. A frequent 'quick-fix' for many Word problems is to close the program and rename Normal.dot to, say, Abnormal.dot. When Word is restarted it will create a new 'straight out of the box' copy of Normal.dot. This, of course, won't contain any custom styles, toolbars or autotext that you have created, nor will it have any macros. Some Word aficionados would argue that this is the way things should be – all customisation and macros should be kept in user templates rather than in Normal.dot. Personally, I wouldn't be so rigid. I have a few macros that I find universally useful, such as pasting as plain text and opening the folder containing the current document in Explorer. And I also like to get rid of some of the less useful Autotext entries, such as 'Dear Mom and Dad', and add others, such as 'Personal Computer World'.

There is a way of having the best of both worlds, which is why I suggested renaming Normal.dot rather than deleting it. There are several ways of getting at the Organizer, but the most consistent across Word versions is through Tools, Templates and Add-ins, then hitting the Organizer button. You'll see four tabs here: for styles, autotext, toolbars and macro projects. Each tab has two panes showing a list of the items available in the current document and Normal.dot, with buttons to copy, rename or delete items. You can choose other active templates or documents from the '...available in' boxes, or choose any template or document by hitting the Close File button. This will remove the current file from the Organizer (though it does not close the file in Word) and the label on the button will change to Open File. This will let you browse to any document or template – including a renamed Normal.dot (see screenshot 1).

There's another trick worth remembering with Normal.dot, and that's to tick the option to 'Prompt to save Normal template' in the Save tab of Tools, Options. If this option is unticked, then Word saves changes to the Normal template without



Top: Copy styles, macros, autotext and toolbars

Bottom: Get a table of all commands and keystrokes

asking. As it's all too easy to make inadvertent changes, then the prompt is quite a good idea. An even better idea would be if Word let you see and review the changes to Normal.dot, but that is not possible. This brings us on to another of Word's great mysteries. Sometimes you can swear blind that you haven't made any changes to Normal.dot, but the prompt still appears. The most likely suspect for this is an add-in or another global template. If you look under Tools, Templates and Add-ins, you can see – and remove – these. Usually they will be from third-party applications: optical character recognition software is a frequent culprit, as it will try to put buttons on the Word toolbars.

Keys – a bigger bunch

Our tip about printing Word key assignments ('A bunch of keys' in June's column) didn't impress reader Stephen Fletcher. 'All I got was "Global Key Assignments", which is a column of titles with the contents the same as the titles.' The key word is the third in the paragraph – 'custom'. If you have not made any custom key assignments, then you

won't get any printed. If, like Stephen, you want a list of useful standard Word keystrokes, then there is a way of doing this. Go to Tools, Macro, Macros, and in the 'Macros in' box, select 'Word commands'. Scroll down the list to 'ListCommands' (see screenshot 2). Select this and click 'Run'. You'll get a box asking you if you want a list of the current keyboard and menu assignments, or all commands, even those (such as ListCommands) that are not assigned to a keystroke or menu. When you press OK, you'll get a new document showing the commands, the modifiers (Alt, Shift and Ctrl), the keys and the menu locations. The list includes both Word's built-in assignments and your own customisations. Since this is a Word table, you can sort it any way you want, such as by menu or by key.

Caesar salad

I never cease to be impressed at the scholarship of this column's readers, and when I mentioned Julian dates in July's column, Alan O'Brien suspected that I meant a Gregorian date, as an Act of Parliament in 1752 changed England and Wales and the colonies from the Julian to the Gregorian calendar. The Julian calendar was devised by Sosigenes of Alexandria under the orders of Julius Caesar. By 1582, the Julian Calendar was 10 days adrift from the seasons and Pope Gregory XIII had the calendar overhauled. This information drove me to the last resort of a journalist – to look things up. And it turns out that a Julian date can mean two things, neither of which has much to do with Caesar's calendar. In accounting, a Julian date is expressed in figures by year and day number, so 2003365 is the 31 December 2003. In astronomy, and in the field codes mentioned in July, the Julian date is the number of days since 1 January 4713 BCE (Before Common Era). This system was invented by Joseph Scaliger in 1583, and possibly named after his father, Julius Caesar Scaliger.

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.



Analysing the accounts

How to tailor a PivotTable to suit your needs

David Cale has a sales ledger with over 2,000 entries. He wrote: 'I need to produce an analysis of customer numbers each month by offer type and by turnover, but cannot find an easy way to get an Excel PivotTable to work.'

A PivotTable can summarise all or part of a data table in many different ways, without changing the data on a worksheet. Our example contains 20 entries, but it works just as well with 200 or 2,000 records.

In a blank Excel worksheet, enter the headings Offer type, Turnover £, and Customer numbers in cells A1, B1 and C1. In the range A2 to A21 enter the letters A, B or C in random order. They represent the types of accounts David's company has on its books. In B2 to B21 enter random amounts between 10,000 and 1,000,000. These are the recorded turnovers of the customer in each ledger entry. In column C enter random customer reference numbers.

Click anywhere within the list and choose PivotTable on the Data menu. Click Next. The next step shows the data range you wish to use, which will be \$A\$1 to \$C\$21 in this example. Click Next and then the Layout button. Drag the Offer type button into the ROW rectangle. Drag the Turnover £ button into the COLUMN rectangle. Drag the Customer Number button into the DATA area. Click OK and Finish.

On the new PivotTable, right-click on the first entry under the Turnover subheading. Choose Group and Show Detail, Group. Uncheck the Auto boxes and enter 0 in the 'Starting at' box and 1000000 in the 'Ending at' box and 200000 in the 'By' box.

Right-click where it says Grand Total, choose Field settings and then Count Nums. You should have a PivotTable similar to screenshot 1.

The result shows how many accounts of each type, A, B and C, there are in the sales ledger, with totals for both the different Offer types and the steps in account size.

Look at it another way

Let's suppose that management asked for different information from the same ledger. Add another column to the original table headed Date. Enter on each row that has a record, any date between 1/1/04 and 31/12/04.

SCREENSHOT 1

	B	C	D	E	F	
2	Analysis of accounts					
3	Count of Customer Numbers	Turnover, £				
4	Offer type	0.199999	200000.399999	600000.799999	800000.1000000	Grand Total
5	A	3	1	2	1	7
6	B	2	2	1	2	7
7	C	3	1	1	1	6
8	Grand Total	8	4	4	4	20

SCREENSHOT 2

	B	C	D	E	F	
1	Offer type	B				
2						
3	Sum of Turnover, £	Date				
4	Customer Numbers	Qtr1	Qtr2	Qtr3	Qtr4	Grand Total
5	1213588	£675,888				£675,888
6	1213591		£95,889			£95,889
7	1213594			£989,562		£989,562
8	1213597				£899,752	£899,752
9	1213600	£111,222				£111,222
10	1213603		£210,000			£210,000
11	1216065			£250,000		£250,000
12	Grand Total	£787,110	£305,889	£1,239,562	£899,752	£3,232,313

Now, looking at it by Offer type, you can find the total of all the customer turnover figures by quarter.

Click anywhere within the list and choose PivotTable on the Data menu. Click Next. The next step shows the data range you wish to use, which will now be \$A\$1 to \$D\$21 because you've added a column. Click Next and then the Layout button. Drag the Offer type button into the PAGE rectangle. Drag the Date button into the COLUMN rectangle. Drag the Customer Number button into the ROW rectangle. Drag the Turnover button into the DATA area. Click OK and Finish.

On the new or revised PivotTable, right-click on the first entry under the Date subheading. Choose Group and Show Detail, Group. Check the Auto boxes to cover all the dates and choose Quarters in the 'By' box.

By default, the Grand Totals at the foot of the PivotTable will show the sum of the turnovers for each quarter for the selected Offer type, as shown in screenshot 2. You can select the Offer type to review in cell B1, or display all of them if you wish.

Further information

In a spreadsheet data table the columns hold fields and the rows hold records. With a record of club payments, the fields might include the club members' names, the dates payments are due, the dates the payments are made, and the

Top: You can analyse a large data list with a PivotTable

Bottom: A variety of information can be gleaned from one data list

amounts of the payments. A record would be all that information for one member.

A PivotTable is simply a built-in facility for summarising useful information from this list. Each column in your source data becomes a PivotTable field which summarises multiple rows, or records, of information.

It could total all the amounts due at present, or count how many members haven't yet paid. It could tell you how much income the club received from members during each month of the year. A PivotTable report is interactive with the data table, so you can change the view of the data to see more details or make different calculations.

There is a limit of 8,000 items in an Excel PivotTable, but the main restriction is the amount of available memory in your PC.

To access an external data table, choose the Import External Data option on the Data menu. The default connection method produces .odc (office data connection) files. These can return the data directly to a PivotTable, without running the PivotTable Wizard.

CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: spreadsheets@pcw.co.uk. Please do not send unsolicited file attachments.



Ken McMahon

Is a freelance journalist and graphic designer. His involvement with digital graphics began with a Commodore 64. He graduated to Macs and now works mostly with PCs. Draw your own conclusions

Pick and scan

If you have old transparencies and negatives that need digitising, here's how

In the rush to embrace digital photography, it's easy to forget that anyone over the age of 21 with more than a casual

interest in photography will have a large back catalogue of analogue images. For prints, a cheap flatbed scanner is the answer, but if the Hands on mailbox is anything to go by I am not the only one with a large collection of colour transparencies and black and white negatives that would benefit from being digitised.

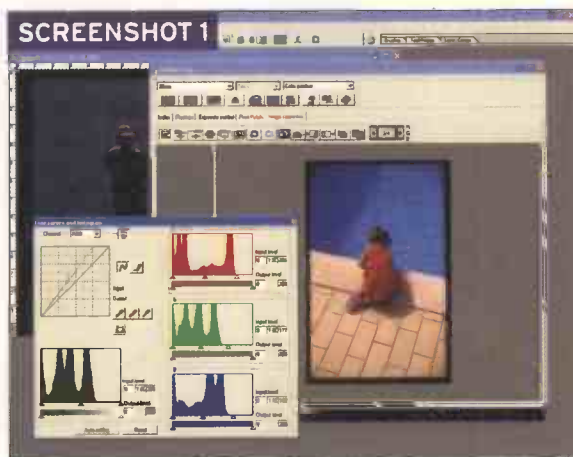
A tempting option if you're on a tight budget is to go for a flatbed scanner with a transparency hood. This route might seem to make economic sense if you already own a flatbed that offers a hood as an optional extra. The problem is, while they make an excellent job of reflective material and can give reasonably good results with black and white and colour negatives, flatbeds produce quite poor results with colour transparencies.

Apart from the fact that they lack sufficient optical resolution to make a decent-sized enlargement from a 35mm transparency, they also lack the ability to capture detail in the full tonal range, particularly in shadows.

Dedicated transparency scanners are providing a more affordable method of digitising transparency libraries. They don't provide the quality you'd get from a professional drum scanner but they are a huge improvement on what you can expect from a flatbed with a transparency hood, and they provide sufficiently high-quality images for all but the most demanding applications.

For the past month I've been using two scanners to digitise the collection of transparencies, and colour and black and white negatives that I've been accumulating for more years than I care to mention – the Minolta Dimage Scan Elite 5400 and Nikon's Coolscan V ED (also known as the LS 50 ED). I chose these two because they are similarly priced and, at around £500 inc VAT, are within the budget of professional image users looking for an alternative to drum scanning, as well as most serious amateurs.

Because you're dealing with very small originals, transparency scanner resolution is important as it determines the maximum reproduction size. The Minolta's



Minolta's Dimage Scan provides one-touch histogram adjustment for individual channels

maximum image size of 5,232 x 7,800 pixels produces a 17.25 x 26in image at 300ppi (pixels per inch); in other words, a good-quality inkjet or commercially printed image slightly bigger than A2. The Nikon Coolscan V ED's maximum image size is significantly smaller at 3,496 x 5,959 (using the SA-21 film strip adapter) and produces an 11.65 x 19.86 image at 300ppi – slightly bigger than A3.

The scanners are similarly sized – both slightly smaller than a shoebox with the Minolta being longer and thinner. Both are supplied with holders for mounted transparencies and film strips up to six images in length. But the Nikon accepts only single-mounted transparencies, whereas the Minolta's carrier accommodates up to four at a time. For batch scanning of transparencies with a Nikon scanner you'll need to look at the more expensive Super Coolscan 5000ED with the SF-210 slide feeder which takes 50 mounts.

With the Minolta, you load the plastic holder then feed it into the scanner's front drawer. The Nikon's MA-21 slide adapter and SA-21 film strip adapter slot into the front of the machine, and individual mounted transparencies or film strips are then fed directly into the scanner.

The other main external difference between the two scanners is that the Minolta has an IEEE 1394 (Firewire) interface in addition to the high-speed USB2 port. In performance terms this makes little difference;

How Ice works

Digital Ice is a suite of products developed by Applied Science Fiction and acquired by Kodak in May 2003. The Digital Ice³ (Ice cubed) suite comprises three technologies: Digital Ice (image correction and enhancement) removes dust and scratches, Digital Roc (reconstruction of colour) restores faded colours, and Digital Gem (grain equalisation and management) reduces grain.

Nikon's New film scanner range, including the Coolscan V ED, incorporates Digital Ice⁴ (Ice Quad) which, in addition to the Ice³ components, includes Digital DEE (dynamic exposure extender), which enhances shadow and highlight detail.

Ice uses a combination of hardware and software and is therefore only available as an option with scanner hardware. Nikon was the first film scanner manufacturer to incorporate Ice into its products, but you can now find it in Benq, Durst, Epson, Kodak, Minolta and Umax scanners, among others.

Roc and Gem don't rely on hardware and are available as Photoshop plug-ins from www.asf.com. There, you'll also find a plug-in called Digital SHO which appears to do a similar thing to the Digital DEE feature of Ice⁴.

Software methods of dust and scratch removal (other than manual retouching), such as dust and scratches despeckle and median filters work by blurring the image, but Ice manages to eradicate dirt, hairs and scratches with no softening.

It manages this by analysing image data in the infra-red part of the spectrum. The dyes used in colour negative and transparency films are transparent to infra-red light, but dirt and scratches are not, so an infra-red scan shows just the dirt and scratches. With this information from the scanner, all the software has to do is fill in the gaps by interpolating colour and tonal values from surrounding pixels.

The cold cathode fluorescent light source used in the Minolta Dimage Scan Elite 5400 emits sufficient infra-red light for Ice to work successfully. The Nikon Coolscan V ED which uses LED light sources includes a special infra-red LED purely for this purpose.

The dyes used in Kodachrome film can cause problems for Ice but, although my test material included a large quantity of Kodachrome slides, I didn't notice any obvious problems with either scanner.

Ice doesn't work on black and white negs, so those retouching skills may still be required.



quoted scanning times with the Firewire port are marginally slower than with the USB, but it does provide an alternative high-speed connection for those without a USB2 port.

Both scanners are supplied with applications that can be run in standalone mode or as Twain plug-ins from an image-editing application – both also come with a copy of Adobe Photoshop Elements 2.

I found Minolta's Dimage Scan 1.1 (see screenshot 1) the more straightforward of the two. It features a tabbed panel with sections for thumbnail 'index' previews, prescan previews and resolution control, exposure control and image correction. The index scan produces thumbnail previews of all four (or, in the case of the filmstrip holder, six) images and you can produce a final scan directly from this, but if you want to correct the image during scanning it's necessary to perform a prescan. You can then make adjustments to the tone curves and histogram. An Auto setting button makes separate adjustments to the red, green and blue histograms, and in most cases this was the only adjustment necessary to produce excellent scans.

Using Dimage Scan I very quickly adopted a routine of index scanning, prescanning adjusting, then final scanning images in batches of four, and this stage of the process was very quick. But the scanning speed of the Minolta could be a drawback if you have a lot of material to get through. Previewing and scanning without Ice dust and scratch removal (see boxout) is relatively swift, although it is slightly slower than the Nikon Coolscan V ED. 1. At 15 seconds for an index scan, 10 seconds for a prescan and under a minute for a final 1,744 x 2,600 final scan, things zip along fairly speedily. But turn on the Ice and things cool down pretty rapidly. Table 1 shows preview and scanning times for transparencies and mono and colour negatives.

To produce a final 1,744 x 2,600 scan from a colour transparency, with Ice dust and scratch removal turned on, took the Dimage Scan Elite 5400 four minutes and 20 seconds. With colour negs this increased to six minutes and 12 seconds. In practice this means that once everything is set up to scan four transparencies, you press the button and come back nearly 20 minutes later, or almost half an hour in the case of a strip of six colour negs.

By comparison, the Nikon Coolscan V ED can complete a final scan with Ice at the same resolution in under a minute and a half. It's

TABLE 1

MODEL	MINOLTA DIMAGE SCAN ELITE 5400	NIKON COOLSCAN V ED
Price inc VAT	£491.51*	£486.95*
Light source	Fluorescent tube	RGB and infra-red LEDs
Image sensor	Linear CCD	Linear CCD
Optical resolution	5,400ppi	4,000ppi
Max image size	5,232 x 7,800	3,946 x 5,782 (with MA-21) 3,496 x 5,959 (with SA-21)
Max bit depth	16bits per pixel	16bits per pixel
A/D conversion	16bits	14bits
Dynamic range	4.80	4.20
Interface	IEEE 1394 and USB 2.0	USB2
COLOUR TRANSPARENCY		
Index scan	15 seconds	14 seconds
Prescan	10 seconds	14 seconds
Full scan 1,744 x 2,600	55 secs	38 seconds
Full scan with Ice	Four minutes 20 seconds	One minute 26 seconds
COLOUR NEG		
Prescan	15 seconds	27 seconds
Full scan 1,744 x 2,600	60 seconds	43 seconds
Full scan with Ice	Six minutes 12 seconds	One minute 37 seconds
BW NEG		
Prescan	Nine seconds	15 seconds
Full scan 1,744 x 2,600	55 seconds	52 seconds
Full scan with Ice	N/A	N/A

* Prices from www.cameras2u.com

also quicker by several orders of magnitude on colour and black and white negs, though slower at prescanning. Although it scans much faster, the drawback with the Coolscan V ED, for mounted transparencies at least, is that you have to do them one at a time. From my experience with both methods, I'd say I prefer to set everything up and then do something else while waiting for four images, rather than having to do each one individually.

Of course, without the Ice enabled, the difference in scan times is much reduced. But unless your material is scrupulously clean I doubt you'd be able to get by without it.

Nikon Scan 4 provides a pre- and post-processing preview and extensive toolset



The Minolta's Ice is much more aggressive than the Nikon's and removes all but the largest specks of dirt. The Coolscan's Ice⁴ provides a normal and fine option, but even on the normal setting, larger dust specs, hairs and scratches got through the net.

The Minolta images are slightly softer than the Nikon's; this may be a consequence of the more effective Ice or it may be down to other characteristics of the scanner. Either way, I'd take this in preference to having to spend time retouching these blemishes later.

On the plus side for the Nikon, it also offers Gem and Roc image processing, which respectively remove grain and restore faded colours. Another useful tool in the Ice⁴ stable is digital DEE, which provides control over shadow density (see screenshot 2).

To assess the quality and performance of the scanners I scanned a large quantity of test material, including colour transparencies, colour negatives and mono negatives. A selection of these is included on the cover DVD.

Bring out the Gimp

The Gimp – GNU Image Manipulation Program – is something I've often heard about, but, not being a Unix person, never really



bothered with. It is an open-source (and therefore free) image-editing application that was developed in the mid-1990s by two students at Berkeley University, Spencer Kimball and Peter Mattis.

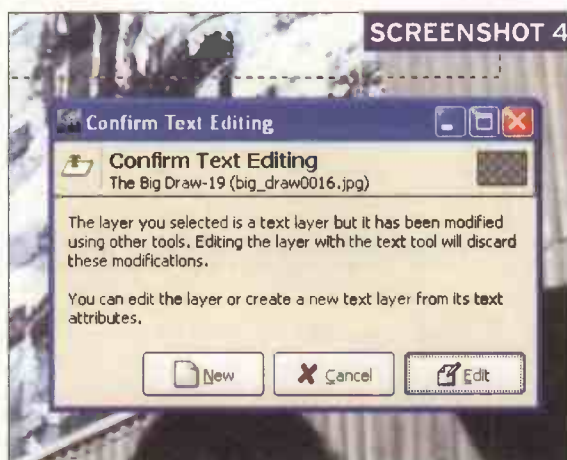
In the early days, the Gimp was pretty rudimentary and not the most stable of applications. But with the support of the open-source community, it has grown into quite an impressive program. While it may not quite rival Photoshop, it doesn't cost £600 either, and all the important features you'd expect to find in a decent image editor are there, including layers, multiple undo, colour and exposure correction, transform tools, scripting, a good range of selection tools and plug-in filters.

All this might be of academic interest to those for whom Unix is not the OS of choice, were it not for the fact that the Gimp is now available for Windows and Mac OSX. For more info on the Gimp go to www.gimp.org (or see July's DVD) and to download the Windows version go to <http://www2.arnes.si/~sopjsimo/gimp>. You can get the Gimp for Mac OSX from <http://gimp-app.sourceforge.net>. To run the Gimp on a Macintosh you also need Apple's X11 X windows environment which you can download from www.apple.com/macosx/features/x11.

Installing the Gimp on Windows XP was a lot more straightforward than I thought it was going to be. There are two installers, one for the GTK (Gimp Tool Kit) and another for the Gimp application, and these must be installed in the correct order. If you want to open Postscript and EPS files you'll also need the Ghostscript Postscript interpreter – another Gnu General Public Licence application – which you can download from www.cs.wisc.edu/~ghost.

I thought it would be interesting to see how the Gimp coped with some fairly routine image-editing tasks so I decided to spend some time using it in place of Photoshop to prepare images for the web. Typically, this involves opening the files, cropping, making any necessary levels and colour adjustments, unsharp masking, and finally downsampling and producing compressed jpegs.

The first time you run the Gimp you may have to wait a while for it to index all your fonts. As a regular Photoshop user who does the occasional bit of moonlighting in Paint Shop Pro, I found the Gimp



Top: The Gimp's interface is well organised with palette docks

Bottom: Gimp text transformations are lost if you decide to edit

interface quite familiar, although having menus on the toolbar takes a bit of getting used to, as does the way each window behaves independently of the others (see screenshot 3).

For example, clicking in the image window doesn't automatically bring the toolbox and Layers palette to the front. But the interface is well organised, with an options palette below the toolbox and configurable docks for the layers, channels, undo history, paths and other palettes.

The file open dialogue is also a bit of a pain, as it doesn't seem able to display a preview thumbnail of images unless they have been previously opened or are in the Gimp's .xcf format. But these are fairly minor details in what is generally an accomplished application.

The crop tool necessitated my first call on the F1 button, only to discover the help files were missing. These are available as a separate download and I'd recommend you install them. Even then, I couldn't get help to work from within the application, but by going to C:\Program Files\GIMP-2.0\share\gimp\2.0\help\en you can launch the HTML help index.

There's an extensive array of plug-

in filters including blur, noise, despeckle, unsharp mask, edge detection, 16 distortion filters, bump, displacement and other mapping variants, lighting effects including flare, and a channel mixer. Few of these provide a live preview, though some show a thumbnail preview in the filter dialogue. Unsharp mask isn't one of them, and this makes what should be a fairly routine operation pretty tedious as you have to apply the filter, check the results and, if necessary, undo and repeat the process with different settings.

One thing the Gimp does have over Photoshop is that, in addition to re-applying the last used filter, the filters menu provides an option to open the last used filter dialogue box, so you can apply it with revised settings.

Text is set in a dialogue box rather than on the image, but once it's in place you can reformat it from the text options palette. There's an auto-hinter for fonts that don't have built-in hinting and you can turn text into paths.

The Gimp has an interesting approach to editing text to which transformations or filters have been applied – it discards them, though it has the good manners to let you know in advance that this is going to happen (see screenshot 4).

The Gimp's approach to producing gif and jpeg images for the web is a little haphazard. Gif palette settings, dithering options and so on are determined when you make the mode change from RGB to indexed colour. My attempt to export an RGB image as a gif resulted in a crash.

The save as jpeg dialogue provides quality and smoothing sliders, subsampling options and you can choose to save exif data. You can also see a preview in the image window; if you want a before and after view, first duplicate the document by pressing Ctrl&D.

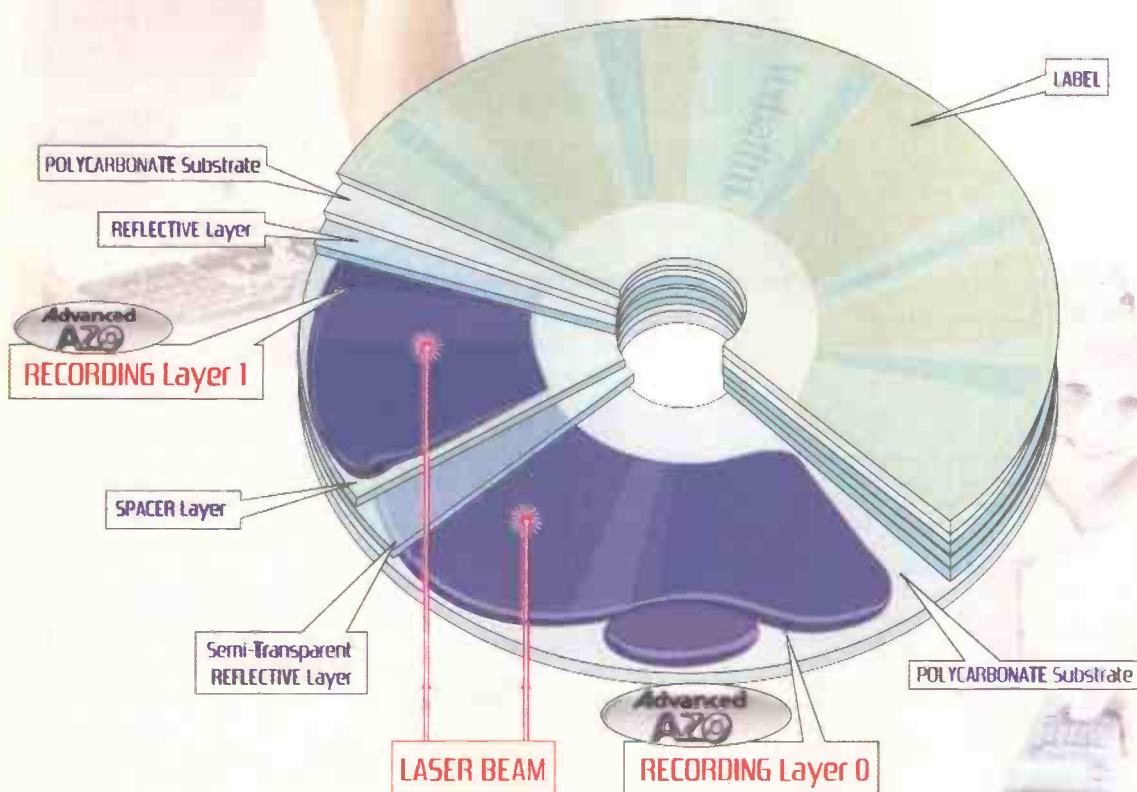
Although there are a lot of minor criticisms you can make of the Gimp, they mostly relate to the design of the interface rather than lack of features, and if you're prepared to live with these limitations the Gimp makes for an excellent and free alternative to commercial image editors.

CONTACTS

Ken McMahon welcomes your comments on the Digital imaging & video column. Email him at: digitalimaging@pcw.co.uk. Please do not send unsolicited file attachments.

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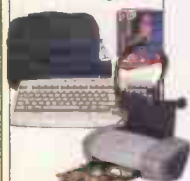
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Avoid the expense of overseas calls

What does mobile roaming do to your phone bill?

It's one of those horror moments after a holiday; the list of things that went wrong used to be headed by 'we forgot to arrange to have the garden watered' or 'perhaps we should have locked the back door, really' or even the classic: 'I thought you were going to cancel the milk?', but today, this is the one we all dread. It comes when you see just how much the phone company skimmed off you at 45p a minute for overseas calls. And incoming, too!

The easy answer for the bulk of calls is to use the Internet. You feed your voice into the digitiser (a notebook PC) and transmit the data stream that comes out of it over the Internet to someone who decodes the stream back into the sound of a voice. Easy, as I said. All you need, then, is a digitiser, and something to stream the data over the Internet.

Amazingly, there's a huge choice of things to use. The most discussed product in this year's gossip is Skype, which has been surprisingly popular, mainly because it is simple.

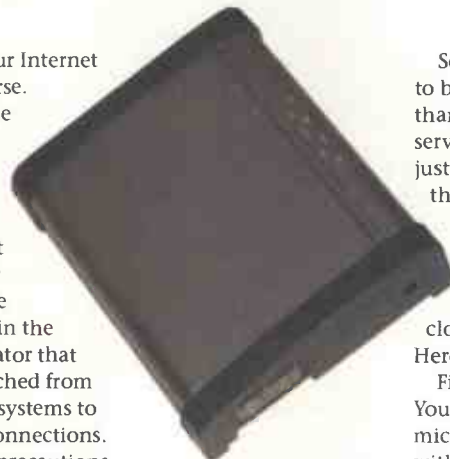
Astonishingly few people realise that the sort of network Skype provides already exists on their own PCs. You have to work very hard to find a PC that doesn't come with MSN Messenger on it, and the network that carries the instant messages will also carry voice, and even slow video. And it is free – apart

from paying for your Internet connection, of course.

Even fewer people realise that the ordinary phone in their home is, quite possibly, an Internet phone. But in fact, some 10 per cent of landlines are using the Internet, in the sense that the operator that runs them has switched from traditional routing systems to Internet Protocol connections. And with the right precautions (which we'll discuss in a bit) they could indeed use the public Internet.

In between the instant messaging applications and the Internet phone firms comes the new generation: the SIP networks. Session Initiation Protocol (SIP) sounds complex, but it is simple once you understand that it is just trying to avoid the complexity of normal Internet connections.

What has changed the landscape is the fact that SIP phone providers are suddenly proliferating – and unlike the IM/Skype opposition, they are linkable to the standard PSTN. So you can make a call (free) to any other SIP phone user anywhere in the world, but you can also receive a call on your SIP phone from people with ordinary landlines or mobile phones. And (for a small extra fee) you can also make calls to them.



A Sipura ATA box. Plug the ordinary phone into one end, and connect the other to the Ethernet Lan. The phone will work like any other phone

So every mobile PC user who plans to be away from the family for more than a day should install this sort of service, and the only real choice is just to decide which one. At least, that's the theory.

Normally, this column comes with a fairly enthusiastic 'Try this!' recommendation. With SIP phones, that endorsement is clouded with words of caution. Here's why.

First, you need new hardware. You need a headset with built-in microphone. In theory, anybody with a notebook PC already has a microphone and speakers. Echoes, whistles and awkward-sounding voice quality are almost always the result of trying to use these.

Alternatively, you could spend £50 on an ATA box (pictured left), which plugs into your Lan, and you can then plug an ordinary telephone into it. It will have dialtone and will ring for incoming calls.

Second, it's simple. Well, it ought to be. But, of course, in reality things don't always work. The SIP protocol assumes that the two PCs can easily connect to each other. In reality, there are several stages which all have to work, and any one of them can die at any moment. When that happens, it's really hard to find out which point has failed (see picture below).

You may have a firewall set up. It may see these incoming packets and, knowing nothing about the session which is set up, simply refuse to let them through. The SIP proxy works on a given port (typically, port 5060) but that's just where your computer sends the data. The firewall will let that out, almost certainly, but once the session is set up, data comes back

SIP explained

When a normal PC on the Internet goes browsing, it isn't connecting itself directly to the websites it's visiting. It is setting up sessions.

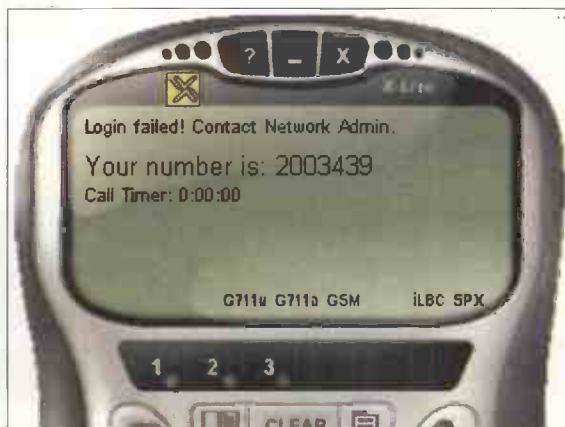
It has to be done like this, because an unprotected computer would be taken over by malicious hackers in minutes of connecting. So the sessions work by creating a temporary authorisation for the remote computer to contact you. You send your details, and if it responds quickly enough with the same session data, then a connection is made for this purpose, and only for this purpose.

SIP sets up a session exactly like this, for carrying voice in both directions. The trouble is, you can't just go to my computer and ask for a session, because my machine will ignore you. So SIP phone networks use a proxy to negotiate – a system very similar to the 'remote control' systems we discussed in an earlier column, like Laplink Everywhere and GotomyPC. Each machine registers a session with the proxy, which watches out for any attempt to contact another of its satellites.

When the call comes in (so to speak) it connects the two, and then SIP takes over and maintains the peer-to-peer session.

What makes SIP an important standard is the fact that it contains specifications not just for connecting two SIP phones, but also for connecting them to other services, such as a standard phone network handset.

The SIP phone client can frequently fail to connect, and good online support is essential





SCREENSHOT 1

on quite a different port or range of ports. Most SIP providers say this is no problem but they are exaggerating.

Another issue is that you're in the hands of your SIP provider. Of course, when you make a call, you're in the hands of BT or whatever telco is carrying the phone network to your phone. We've got used to the idea that you don't just lose dialtone for an hour or a day at a time with those folks. They're big, professional and have an image to maintain. By contrast, the typical SIP provider is small, experimenting constantly with new software, and working on a shoestring. It's not at all unusual for the thing to go down for a whole day, while some programmer tries to implement an 'improvement' to the service which, of course, kills the whole system stone dead.

Vulnerability is a problem. As soon as you open up a gateway between the Internet and the PSTN, you're making a leak in the dam that holds the financial resources of the PSTN back. It's big, big business, hacking these gateways. You can create a hole in one if you have the right skills and tools, and set up a link which is charged to the gateway account, and lets you create a 'local call' circuit from somewhere far away to somewhere else even further away. It may not be a problem for you, but it's a potential disaster for the gateway operator.

Finally, it's as user-friendly as a rattlesnake with a hangover

The list of features that need to be configured is confusing, and they can change themselves when you're not looking

It may not look like a phone... but it can work!

harnessed to a washing machine. The configuration of a SIP proxy server and the client has to be able to change, or bottlenecks occur. So the SIP provider will give you details of how to set up your PC, and you'll enter them correctly – and an hour later, your SIP client will make a routine call to the proxy, asking: 'What are the new settings?' and, if they're changed, will download them. Assuming the provider got them right, this won't cause any problems. How much of your own money would you like to put on a bet that they will get it right?

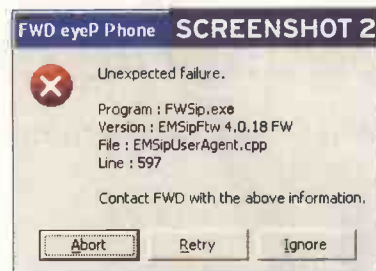
I've found my SIP settings changed so that the SIP proxy was different, the port used was different, the phone number shown was different, and several other parameters were changed, too (see screenshot 1). It was impossible to make it work, so I set it up from scratch. It worked for half an hour, and then, when it was time to check with the host, it downloaded the new, broken settings, and died.

Practical experience

Still keen? Here's how to get started. First, pick a SIP provider. The guru in this area is Jeff Pulver, and he points people at Free World Dialup, which is at www.freeworlddialup.com. There are two options: you can log in, register and get a phone number, then download a 'soft phone' application and configure it. The most popular soft phone is X-Lite from Xten Networks at www.xten.com.

Alongside it, you can choose from eyeP (IP, get it?) Phone Lite from www.eyepmedia.com (pictured below) or the SJPhone from SJ Labs at www.sjllabs.com.

The easiest system is to download a soft phone program which is preconfigured to set itself up for your chosen provider. For example, Gossiptel at www.gossiptel.com provides a version of the X-Lite phone which is preconfigured to work on that network. Free World Dialup (FWD) offers all three, and I've illustrated the setup for the EyeP Phone Lite, which also allocates UK-based 0870 ('national rate') phone numbers for incoming calls.



It may be correctly configured and still fail

It's simple enough, but once the installation is over, it disappears, and you need to have made a note of what it is called and where it is installed.

A pretty ghastly 'skin' (in my opinion) looking like a spaceship from Silver Frog Planet offers you the choice of login or sign up. Press Sign up, and it should be self-installing from there. But there are one or two 'gotchas' to watch out for. If you use an unacceptable character (for example, an asterisk) in your password, it will just say: 'Invalid Response Format.' Stupidly, it checks to see if the two passwords are identical first, rather than after checking to see if they're valid. (Still, it's better than Skype, which doesn't ask for two passwords to compare, leaving you with a chance of not knowing what your password is).

At this point, you have the problem of finding someone else with a FWD account (or Gossiptel or phone number), or you will have nobody to call. However, the whole point of this is that you're going to be calling home when travelling.

So, having installed it on your notebook, now rush over to your desktop and repeat the procedure with a different ID and email address.

Plug in your headset, and it should work. On the downside, I've seen figures suggesting that only 50 per cent of calls complete, which means it may be correctly configured, but still fail (see screenshot 2).

If, however, all goes according to plan, you'll be able to keep in contact with home using your laptop from wherever you can get an Internet connection – without paying expensive roaming charges. Of course, now you need to find a way to get a cheap Internet connection, so check out the June issue for information on roaming with Gric.

CONTACTS

Guy Kewney welcomes your comments on the Mobile computing column. Email him at: mobilecomputing@pcw.co.uk. Please do not send unsolicited file attachments.



K. Cameron

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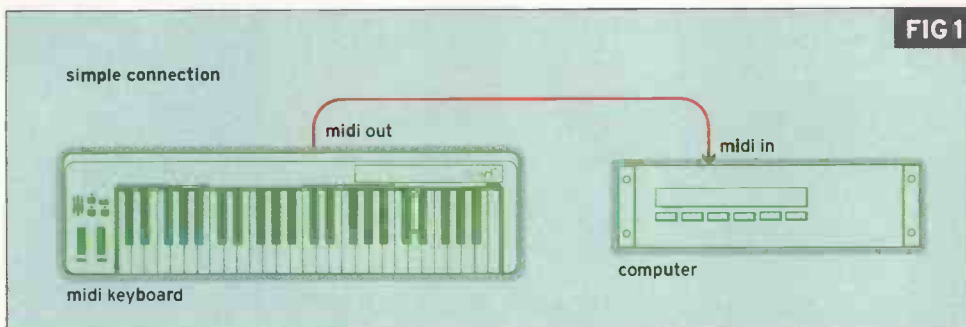
Niall Magennis

has been dabbling in Midi and digital audio since the days of the Atari ST. He writes on a freelance basis for a number of music magazines and lives in London in a flat overrun with music equipment

Understanding Midi

We show you how to hook up a music keyboard to your PC

FIG 1



It never ceases to amaze us how many people have a music keyboard at home and never hook it up to their PC. If the two can be connected, it's criminal not to get them on speaking terms, because modern PCs are fantastic for making music once you add a music keyboard into the equation.

The problem, of course, is that many people just don't understand how to get the two talking to each other. It's a sad scenario, as even cheap keyboards usually support USB or Midi.

If your keyboard supports USB it's pretty easy to hook it up to your computer because you'll already be familiar with USB from other peripherals you've used. However, if it's a Midi keyboard, it's a different story. The chances are that, if you're not already into digital music making, you think Midi has got something to do with cheap all-in-one hi-fis. In fact, Midi is a useful way of connecting digital musical instruments together, so in this column we're going to investigate this ageing music standard.

Midi stands for Musical Instrument Digital Interface, and has been around since 1983, which makes it one of the most enduring digital standards. In the 1980s the big synthesizer manufacturers were starting to develop more and more complicated products stuffed full of sophisticated features. At the same time, musicians were crying out for ways to control one synth from another, or to control whole banks of keyboards from sequencers.

Many manufacturers had already developed their own standards, such as CV and DCB. The problem was that there were too many different

Simple connection
– hooking up a music keyboard to your PC is very easy

standards and many of them were very limited. Eventually it was decided to develop a single standard that all digital instrument makers would adhere to, so that all synths would be able to communicate with each other. That standard was Midi, and it acts as a computer network for digital music instruments. Once connected to a Midi network instruments can send information from one machine to another.

Midi never sends any audio between devices – instead, it sends

is that very little information needs to be exchanged between instruments, so it is cheap to implement – something that was hugely important at the time the standard was developed. But the really big advantage for musicians is that Midi allows you to change just one note in a song, or to change, say, the sound of a melody from a violin to a harp with just a few simple commands. In fact you can easily take an existing song and orchestrate it with completely different instruments by just sending a few simple Midi messages to your synth. In Midi, each instrument is controlled separately, so it's easy to solo an individual instrument or change the volume of one part relative to all the others.

Midi devices are connected using cables with five-pin Din plugs, so if your keyboard is Midi-compatible you'll see at least one of these connectors on the rear. In fact, on most Midi-compatible synths, you'll see two or three of these connectors.

If there are two connectors, one will be marked as Midi-in and the other will be marked as Midi-

out (see figure 1). Sometimes you'll also see a third connector marked as Midi-thru. When connecting up Midi devices you connect the Midi-out of one device to the Midi-in on another. Or if the device has a Midi-thru port, you connect the Midi-thru port on the device to the Midi-in port on the following device. So a Midi network is a daisy chain of connected devices (see figure 2).

Midi on the PC

While all synths use these five-pin Din Midi sockets, PC soundcard makers just had to be different. Until



On the rear of professional synths you'll find three Midi ports

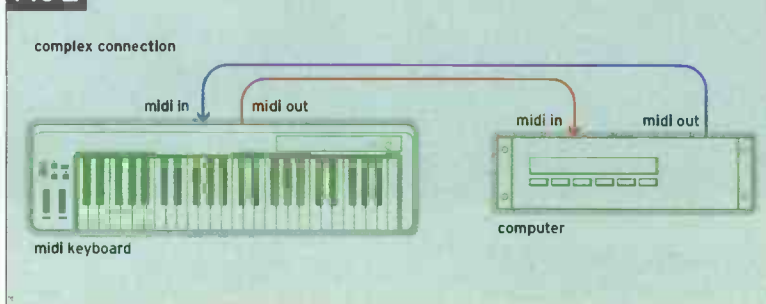
instructions for playing each individual note of each individual instrument. So to sound middle C at full volume, for example, Midi would send a message to the synth saying play note 86 at a velocity of 128.

There are a host of message types built into the Midi standard including ones to control volume, panning and reverb levels. In fact, it's a very open and flexible standard, which helps explain why it's been around for so long.

There are two big advantages to the way Midi uses messages rather than raw audio data to play music. The first

Complex connection – in a Midi network instruments are daisy-chained from one unit to another

FIG 2





Creative's soundcards that use break out boxes generally feature full-size Midi sockets

produce different types of sounds at the same time. For example, a multi-timbral synth would be able to play a piano sound at the same time as it was playing a bass sound. In fact, your soundcard's synth chip will probably be able to play many different instruments at the same time, allowing you to build up lush arrangements.

Now that you know synths can be both polyphonic and multi-timbral you need to understand Midi channels and program messages. Midi is split up into 16 channels. These channels act in much the same way as channels on a multi-track tape recorder. Channels can be played back independently of each other. You can also record each channel separately inside your sequencer. But naturally, when you want to play them back together, Midi will keep all the channels perfectly in time with each other.

Generally, when you're working with a Midi sequencer, you'll assign different synth sounds to different channels. Most of the time you'll find that certain channels have already been assigned certain set sounds. Channel 1 is usually assigned a piano sound and channel 10 is set up as a drum track, for example. However, you can easily alter these sounds using program changes.

Program changes are so called because sounds in Midi are always referred to as programs. Program numbers run between 1 and 128 (or sometimes 0-127 according to how the sequencer decides to number them) and each individual number is used to select a specific sound. However, modern synths can have thousands of sounds built in as

standard, so sounds are organised into banks of 128 programs. These banks are accessed using the Bank Select Midi message. So to choose sound 28 in bank 2, you would send Bank select 2 followed by Program change 28. All these Midi commands

and program messages may sound a bit complicated but, once you've got your keyboard hooked up to your computer, you'll be able to work a lot of it out by trial and error. That way you'll also learn many more Midi secrets along the way!

CONTACTS

Niall Magennis welcomes your comments on the Sound column. Email him at: sound@pcw.co.uk. Please do not send unsolicited file attachments.

a couple of years ago, all soundcards had a gameport. Although a gameport is a trapezoid-shaped connector, you can buy a cheap cable that allows you to use it as a Midi port. This simple lead has a gameport connector on one end and splits into two leads, one of which is for Midi input and one for Midi output.

There are still many soundcards around that either have a built-in gameport or come with one on a separate blanking plate. If you have one of these, you can use it as a Midi port with one of these cables. However, as more and more games peripherals started to arrive with USB connectors, many of the soundcard companies stopped providing gameports on their cards. At around the same time, though, higher-end soundcards such as Creative's Audigy Platinum series started to appear that offered standard five-pin Din sockets on their breakout boxes. But if you don't have one of these, don't worry, as cheap Midi adaptors that connect to your computer's USB port are readily available. The Edirol UM-1SX is a good example of one such converter. It costs around £30 and provides Midi-in and -out connectors.

Once you've got your PC kitted out with some Midi ports you simply connect the PC's Midi-out socket to the Midi-in socket on the keyboard. You then connect the Midi-out socket on the keyboard to the Midi-in socket on the PC (see figure 2). It couldn't be easier really. In fact, if you only want to play sounds on your PC using the keyboard then you only need to connect the Midi-out socket to the Midi-in on the PC and forget about the other connections.

We all know that modern soundcards are great for playing music and sound effects in games. However, what is less well known is that modern soundcards can act as synthesizers too. The latest cards are excellent at this and can even give standalone synths costing many thousands of pounds a run for their money. To take advantage of the synth engine built into your card, you'll need some software.

The vast majority of people who use their PC for creating music use some form of software sequencer.

A sequencer is just a fancy name for a piece of software that can record and play back Midi data. In fact modern-day sequencers generally allow you to record audio alongside Midi notes, and offer so many other features that they're really virtual recording studios.

Many manufacturers include sequencing software with their soundcards, but you can also buy cheap sequencing packages such as Cubasis VST or Cakewalk Music Creator 2003 for £50-£60.

Using Midi

Once you install your sequencer, you'll see that the software will have found two Midi ports instead of just one. This is because your soundcard's drivers will have created one port that corresponds to the computer's physical Midi ports and another virtual one that is used to control the synth on your soundcard. To switch between these ports all you have to do is select the appropriate one in your sequencer. Generally the virtual port will be marked as 'Synth', but different manufacturers name their ports in different ways so you'll have to work it out for yourself. If it's not obvious, just use trial and error.

Before you start using your sequencer you'll need to become familiar with a few terms that will help you understand how synths and sequencers interact. Synths are often described as being multi-timbral and polyphonic in various marketing literature. The two terms sound horribly complicated, but in fact they are quite easy to get your head around. If a synth is polyphonic it means that it can play more than one note at a time. So if you strike a chord it will be able to play all the notes in the chord. Believe it or not some synths can only produce one note at a time. These synths are called monophonic synths and they're mostly used in dance music to play simple melody lines or arpeggios.

If a synth is polyphonic then the chances are it is also multi-timbral. This simply means that it can



Adding a USB Midi converter, such as the UM-1SX from Edirol, to your PC is relatively cheap



Nigel Whitfield

edited computer magazines before going freelance in 1995. A specialist in Internet and consumer issues, he has a degree in Computing Science from Imperial College

Singing Opera's praises

Why not break from the pack and use some of Opera's neat features for web designers?

Many web designers look at Internet Explorer when considering the target browser for their sites; it's the most widely deployed, so the simple option. But there are, of course, alternatives, many of which adhere pretty strongly to standards. And one of the most popular alternatives is Opera.

The latest version, at the time of writing, is 7.51, and if like me you thought that would only be a small improvement on a previous edition then you're mistaken. It's a whole new world of loveliness, and well worth downloading – if you're on broadband, the non-Java version will arrive in the blink of an eye. Best of all, the new version is available for Windows, Linux, Mac OSX and FreeBSD – so you can encourage people to use the same browser across lots of systems.

Opera 7.51 has an interface that, while not much changed from recent versions, does feel much more slick and polished. The tabbed browsing and pop-up blocking may be enough for many people to make the switch, but there's also the built-in email client with spam filtering.

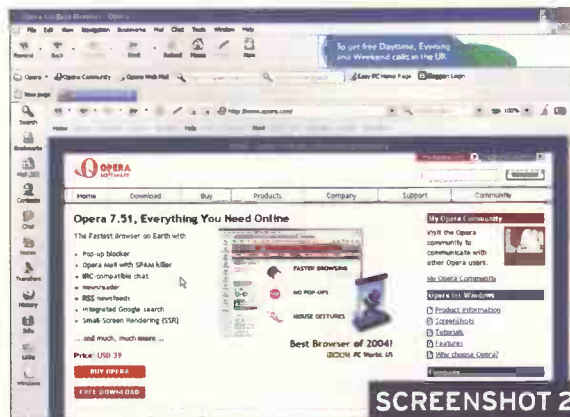
Of more interest to web developers are a couple of other handy features. First, a quick click on the toolbar can show you a page without images – so you can check all your Alt tags easily. Click the same button to see a menu that allows you to switch from 'author mode', where you see what a page author wanted, to other options. These include a simulation of a text browser, high-contrast views and accessibility modes, and there's also a structural view. Together, these options give you a quick and easy way to ensure that the basic accessibility aspects of your site have been taken care of.

The Links panel will pop up a sidebar with all the links in the current page – handy for making sure you've not missed anything out, or testing all the links without scrolling through the page.

But what really struck me as useful were two related features. The first is the built-in RSS browser – if a website has an RSS feed, you can read that directly within Opera. There's no need to download another application, and web pages will open within a browser window. Aside from



SCREENSHOT 1



SCREENSHOT 2

Above: Opera's Navigation bar offers links to help you move around a site, based on extra information in the HTML

the general usefulness of this, there's an amazingly neat touch.

Click on the Navigation menu, choose Site navigation and, when you're looking at sites such as www.guardian.co.uk or news.bbc.co.uk, you'll see a Newsfeed option in the browser menu. And it does more or less what you might think – a new page opens in Opera showing the RSS feed for that site. There's no need to go rummaging around on a site trying to find the details of their feed, which may often be buried on a subsidiary page (see screenshot 1).

The related feature – the thing that makes this magic work – is Opera's use of the Link tag in HTML. It's used to support the Navigation toolbar,

Left: It's magic – select Newsfeed in Opera when you're viewing a site such as The Guardian or BBC News in Opera to go straight to the RSS version

which is turned off by default in 7.51 but can be switched on from the View menu, or you can choose its options from the Navigation menu, under Site navigation.

Turn the menu on, and you'll see various text links appear on a bar, by default above the view of the web page you're looking at. These include Index, Home, Author, Copyright, Summary, Search, Previous, Next, First, Last and the already discovered Newsfeed. Take a look at the Opera website with the Navigation bar turned on and you'll see that they use it in various places – though not throughout the whole site (see screenshot 2).

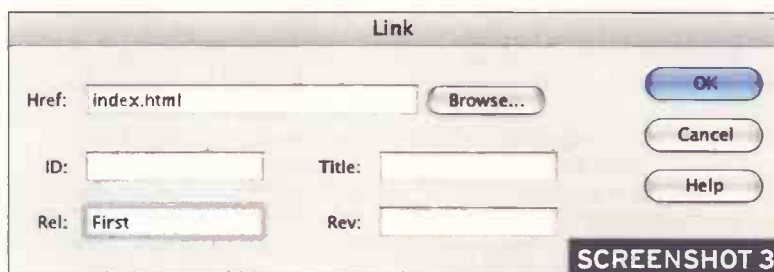
Nevertheless, it can be a handy idea, and it's not difficult to add elements to your pages to support some of the extra buttons, providing people with additional ways to move around and, of course, allowing that near-magical discovery of your RSS feed for anyone using Opera.

Missing Link element

What makes this stuff work in Opera is the LINK tag; to many web designers, it's probably not high on the list of 'must include' items, since it is, frankly, not well supported by browsers. A quick check on my systems here found that of the software I use regularly – Safari, Internet Explorer for Mac, IE 6 for Windows and Opera – only Opera does anything with it.

Normally, I would not recommend that you code pages specifically for features of one browser. Feel free to send in emails complaining of outrageous hypocrisy, but here we're going to break that rule and look at how you can exploit this feature of Opera. Two reasons – first, Link tags

Adding code to support Opera's Navigation bar is trivial in web editors such as Dreamweaver



SCREENSHOT 3



are part of the HTML spec, so it's not as if I'm encouraging you to do anything bad. Second, nothing we'll do here will detract in any way from the experience people have with other browsers. It's just that Opera users will get something better, viz one-click subscription to your RSS feed and easier navigation if you want to go down that route.

First, you may want to do some reading on the Link element. You can find details at www.w3.org/TR/html4.01/struct/links.html among other places. To save you ploughing through all that, which also covers ordinary hyperlinks, here's the basic information you need to know.

The Link tag appears only in the head of your document. It's used to specify the relationship between the current document and others. As the HTML spec explains, this can be used for all sorts of handy things, such as indicating where a printable version of a document is stored, or a version in an alternate language.

Before we go any further, let's look at a simple link tag:

```
<LINK REL="Next" ✓
href="Page2.html">
```

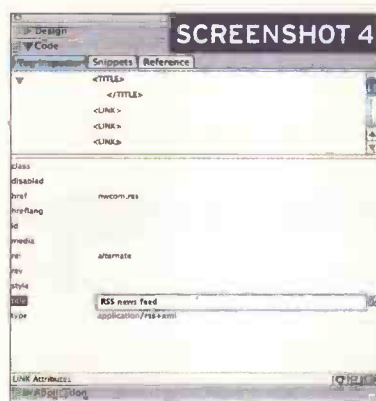
(Key: ✓ code string continues)

That simply says the next page in the sequence is in the file Page2.html; add a line like that to the HEAD of your page and you'll find that the Next button on Opera's navigation bar leaps into life. It can also be used by search engines to help find their way around a site – although that's more usefully done with some of the other values of the 'REL' attribute. For example:

```
<LINK REL="Index" ✓
href="./index.html">
<LINK REL="Copyright" ✓
href="./info/
copyright.html">
```

Broadly speaking, Opera will pick up on a Link tag with a name that matches one of the entries on the Navigation bar; there are a few more of those than are listed in the HTML spec, but no matter. You can easily add these tags manually or using your web editing program; in Dreamweaver, for example, just click on the Insert menu, choose Head tags, then Link and fill in the information – for these basic links you only need to fill in the href value – the target of the link – and the relationship (see screenshot 3).

Obviously, some of the links are going to be pretty much static throughout your site, especially those for 'home', 'author', 'copyright' and perhaps 'help'. So if you're making good use of templates in a program such as Dreamweaver, consider



Use the Tag Inspector in Dreamweaver to specify the correct MIME type for your newsfeed

adding them that way. It's a pretty simple way of updating your whole site with a few clicks.

The Newsfeed button

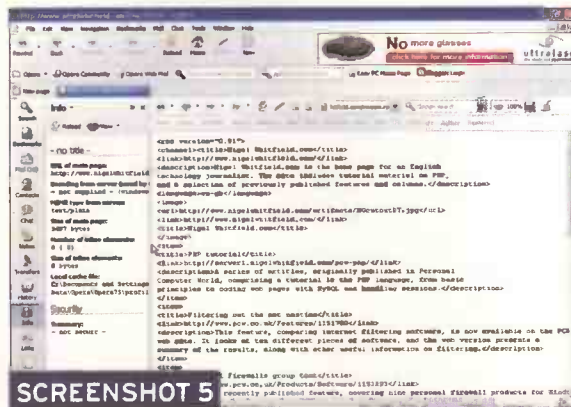
So, it's trivial to add the navigation buttons to your site, but what about that nifty Newsfeed feature? That's slightly trickier, but not altogether complicated. First, find your newsfeed. We'll assume you've done that, following the instructions from the Web development column or the ASP.net method given in recent Visual programming columns.

The best way to proceed is by looking at some of the sites where this magic works for Opera. And a look at those shows that what's happening is the 'rel' element of the link tag is set to alternate, with the type specified as application/rss+xml. Opera doesn't care what the title of these links is, so you can leave it blank or add something there that makes it easy for you to see what you've done when you return to your page later. The code looks like this:

```
<link href="nwcom.rss" ✓
rel="alternate" type="
"application/rss+xml" ✓
title="RSS newsfeed">
```

Dreamweaver users can't just enter all this in the Link dialogue box, since there's nowhere to specify the MIME type. Instead, click to expand the code palette, then click the Tag inspector tab. You'll see something

Opera's info panel (View, Panels, Info) can provide useful information when pages or scripts don't render in a browser



like screenshot 4. Find the appropriate links tag in your document, click on it, and in the bottom half of the dialogue you'll be able to enter the appropriate type.

Now, upload the page to the web server, turn on the Navigation toolbar in Opera, and you should have a live Newsfeed button along with any others that you've added. What happens next will depend on how you've created the RSS feed on your website. It may work just like all the others, in a mildly counter-intuitive way, which is my only quibble with Opera in this regard; click on the Newsfeed link for a site and you'll see the RSS window appear, as you'd expect. But the page you were on – *The Guardian* home page, for instance – will be replaced by the raw code of the feed. You need to click Back on that page to return to the home page.

However, you might find that all doesn't go according to plan, and you end up just seeing the data for your XML feed. That's what happened in my case, as you can see in screenshot 5. You'll also see Opera's info panel appearing to the left of the page, and it's a great help for debugging this sort of problem. It reveals that the server has sent the RSS file to the browser with the type text/plain. Since it's an XML file, that's clearly wrong. It's also easily fixed.

If your feed is generated by a script, make sure the script is sending a MIME type of text/xml. If, like mine, it's a static file, then the file needs to have an extension that the server recognises as XML. You can change the extension – but that might confuse existing subscribers. So you can edit the mime.types file in the Apache configuration directory. Look for the line beginning text/xml, and add the extension of your file to the end of it. In my case that's rss, so it looks like this:

```
text/xml      xml xsl rss
Save the file and restart the web server – with Apache you can make it reload with:
```

```
/usr/sbin/apachectl ✓
restart
```

Now all should be well. You have a newsfeed on your page, with instant access for Opera users – so why not pop along to www.opera.com/promote and download a logo for your site to help spread the good news?

CONTACTS

Nigel Whitfield welcomes your comments on the Web development column. Email him at: webdev@pcw.co.uk. Please do not send unsolicited file attachments.

**Alan Stevens**

has been implementing and supporting networks for over 25 years, working for IT vendors, systems integrators and customers. He now mostly researches and writes about networking matters

Access your files remotely

How to configure Windows XP to act as a virtual private network server

Following the columns on setting up a small network and connecting it to the Internet I've had numerous emails from readers asking how they can take full advantage of such a setup once it's in place. Over the next few issues I'll take a look at some of the things you can do with an Internet-connected home or small business Lan, starting with remote access using VPN (Virtual Private Network) technology.

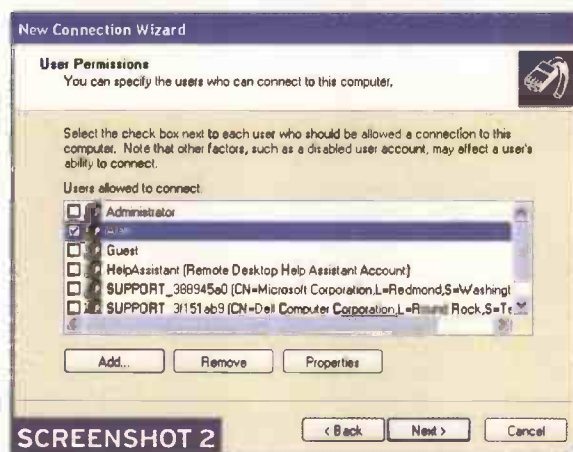
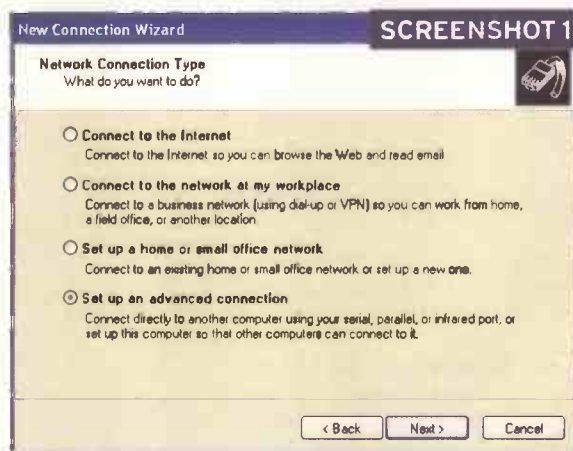
You need two things to create a VPN. A client to run on the PC you'll be using to connect to the remote network, and a VPN server to terminate the encrypted tunnel created by the client at the Lan end. A VPN client is included with Windows 2000 Professional and Windows XP, but the server is a little more problematic.

Some routers come with a VPN server built in and VPN software is also included with Windows 2000 and Windows Server 2003. I've covered both of these in some detail in the past and discussed the advantages and drawbacks, in each case. However, if you're a home user running XP there's a third option, and that's to configure your desktop PC to act as a VPN server – an option that's both cheap (free in many cases) and relatively straightforward.

What's required

The XP route is good for the home user as the ability to configure a VPN server comes as standard in Windows XP, but there are a couple of limitations. To begin with, you can only do this with XP Professional, and the software only supports one remote user at a time. You're also going to need a permanent connection to the Internet with a public IP address that can be used by VPN clients to locate the server.

ADSL and cable broadband connections are a must here and, ideally you'll want a static public IP address. That could cost money (depending on your ISP) and dynamic DNS services can be used as an alternative, although this will add to the complexity of the setup. Also, if you want to remotely access other PCs on the network, beyond the designated VPN server, it's a good idea to fit a second network card. One card can then be used to



Top: The easiest way of configuring a Windows XP Pro VPN server is using the New Connection Wizard

Bottom: It's a good idea to assign a password to any user account allowed to connect to the VPN server and limit the rights of those users too

connect to the Internet and provide the public VPN access, with the other connecting to the local network. It's not essential, but good practice as far as security is concerned.

One other consideration applies if you've an Internet router with NAT (Network Address Translation) hiding your Lan addresses. Make sure the router can map the public IP address assigned to its Internet port (the address the VPN clients will use) to the NAT address of the XP server on the local network. Any firewall will also need to be configured to let VPN traffic through (I'll cover this later), and you should look specifically for VPN pass-through facilities.

Setting up a VPN server

It's surprisingly easy to configure XP with a VPN server. From the Control Panel, navigate to the Network Connections folder and click on the Create a new connection task. A wizard will start and when you're asked for the type of connection to

create, you should choose the entry marked Set up an advanced connection, as in screenshot 1.

On the next screen choose Accept incoming connections, after which you'll be presented with a list of available connection devices. These can be safely ignored as they have nothing to do with the VPN server. Just click on Next then tell the wizard to Allow virtual private connections.

That done, you'll be asked to specify users who will be allowed to use the connection. You'll already have at least one user configured under XP, but you may not have added a password, which is required for security. You might also want to consider only allowing user accounts with limited access rights to connect via the VPN, again, for security reasons (see screenshot 2).

Next the Networking Software dialogue lists the networking protocols and services to be enabled for incoming connections. The Internet Protocol (TCP/IP) settings will need to be modified here, by double-clicking the appropriate entry in the list (see screenshot 3).

If you want to stop remote access to resources other than the VPN server, make sure there's no tick in the box marked 'Allow caller to access my local area network'. Otherwise make sure it's ticked to enable other devices on the network to be reached. You can also manage the allocation of IP addresses that will be assigned to clients when they connect.

One way is to use DHCP (this needs a DHCP server on the Lan), but it's just as easy to specify the address range using the boxes supplied. After all, you only need a couple of addresses, as XP only supports one active VPN connection at a time.

The addresses you specify must be on a subnet with access to the network you want to use. Also, if you intend to connect to the VPN server from a PC on another network, it needs to be on a different subnet otherwise, even though it will appear to connect OK, none of the remote Lan resources will be accessible. That's because if the same subnet is used the client won't know whether to send packets out (or receive them back) via the local network or the VPN connection.

Once you've done all this and finished running the wizard, an Incoming Connections icon will be



created in the Network Connections folder. Any later changes can be made by selecting the properties of this icon, using the right mouse button menu.

Out at the client end

Your new VPN server will run in the background on the Windows XP system, listening out for clients trying to connect. These can be PPTP (Point to Point Tunneling Protocol) clients or those running L2TP (Layer 2 Tunneling Protocol) with IPsec security. Of the two, PPTP is the easiest to configure and manage and, although arguably less secure, is probably the best for home users looking for occasional remote access.

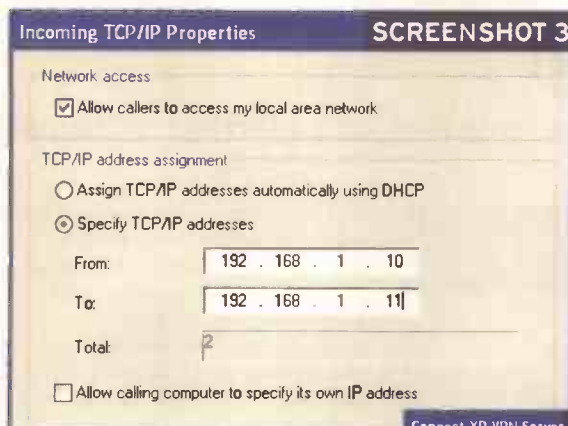
VPN client software for both protocols is built into Windows 2000 Professional and XP. It is configured using the New Connection wizard, this time by choosing Connect to a private network through the Internet when asked for the connection type. You can then give the connection a name and, if you need to connect to the Internet via a dial-up service, specify the dial-up connection required to avoid having to run it manually every time. You're then prompted for the name of the VPN server (if accessible using DNS) or its IP address, followed by whether or not to make the VPN connection available to all users sharing the PC.

PPTP will be the default tunnelling protocol unless you specify otherwise, so no further changes are required. Take the option to create a desktop shortcut for the connection and double-click on it to connect (see screenshot 4). You'll be asked for a suitable user name and password, after which a series of progress messages (including those for the dial-up connection, if specified) will be displayed. Finally, assuming it all works as expected, a taskbar pop-up will appear indicating that a successful connection has been made.

Accessing resources

It's at this point things can start to get a little difficult. Even though you're connected to the VPN server you won't find it listed when you look in the client's Network Places folder or when you browse the network using Windows Explorer. Neither will you see any other resources on the remote network because the Netbios information, used to map network names to IP addresses, isn't propagated over the VPN tunnel.

One way round this is to set up local and remote WINS and DNS servers but, for home use that will add hugely to the amount of work required. Instead, use IP addresses

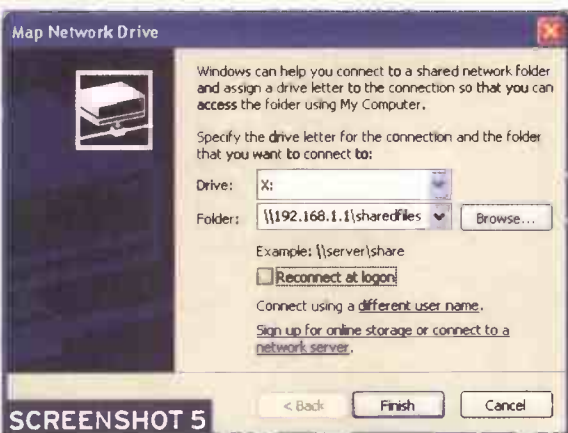


Above: Specify IP addresses that will be assigned to the VPN clients, which should be on the subnet they need to access

rather than network names to locate and access the resources you want.

So, for example, you can locate a remote server by searching for it by IP address then, once it's found, create a desktop shortcut for future use. Similarly you can map network drives to shared folders using IP addresses. If the shared folder is on a server with an address of 192.168.1.99, for example, you can map a drive to \\192.168.1.99\sharename. This can be done from the command line (using the net use command) or graphically by right-clicking My Computer and selecting Map Network Drive, as in screenshot 5.

Printers can be identified in the same manner but in all cases remember that you're accessing the remote LAN over the Internet. Depending on the type of connection at either end bandwidth is, therefore, likely to be in very short supply and you may not be able to do everything you want in the same way as if working locally. For example, it's probably better to run local rather than remote applications and to copy large files to your local hard disk to work on. You will have to copy them back again when finished but it's



SCREENSHOT 5



On Windows XP and 2000 you can also use the Network Connection wizard to create a client to connect to the VPN server

Netbios names aren't propagated over the VPN tunnel, so you'll need to use IP addresses rather than network names to locate resources

more efficient, especially if the VPN connection is lost in the middle of a large edit. Remember that even a 2Mbit ADSL line in the UK still only has an upload speed of 256Kbits/sec – so that's the fastest you can download information from a remote server using ADSL for its own connection.

Firewall concerns

The security of your VPN server has to be a major concern. In order for it to work, you'll be connecting the host PC to the Internet with a public IP

address. A

Windows 2000/2003 VPN server will automatically reject anything other than VPN traffic, but an XP server won't, so a firewall should be configured. This can be done using either an external device or the built-in Windows XP firewall, although in both cases you'll

need to configure the firewall to allow VPN traffic through.

On an external firewall that means opening up TCP port 1723 in both directions to allow PPTP traffic to pass. Make sure GRE (Generic Route Encapsulation) packets are allowed. On some firewalls GRE has to be configured separately (it may be listed as protocol 47) but on many it's enabled automatically when port 1723 is opened.

The XP firewall needs to be activated on the network interface used to connect to the Internet. This has specific options to allow VPN traffic, with separate boxes on the Settings dialogue to enable PPTP and/or L2TP access.

If you're also using Windows ICS (Internet Connection Sharing) software you may have to modify the firewall service that controls the VPN traffic. By default this will pass the PPTP packets to the host running the ICS software, which may not be what's required. Where a PC other than the ICS host is configured as the VPN server, edit the firewall service marked Incoming Connection VPN (PPTP), specifying the network name or address of the VPN server to use.

CONTACTS

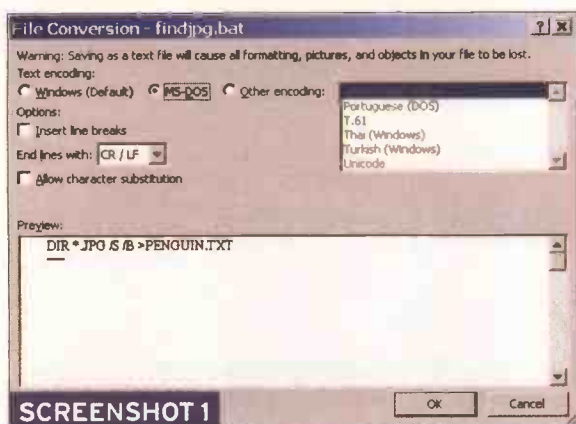
Alan Stevens welcomes your comments on the Networks column. Email him at: networks@pcw.co.uk. Please do not send unsolicited file attachments.

**Mark Whitehorn**

is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars

Mde in Britain

How to save applications as .mde files, and a further refinement to Dos commands



Richard Fitzmaurice has several Access 2000 applications containing Visual Basic code that he would like to save as .mde files, but he finds that the option for saving in this format is always greyed out. The option is found by clicking Tools, Database Utilities, Make MDE file...

Saving an application as an .mde file means that users cannot alter the way the application works. Data can be entered, deleted, sorted and queried as usual, but any underlying code cannot be seen, tweaked, removed or otherwise perverted from its intended task. Creating an .mde file compiles any modules, removes any editable source code and compacts the complete database to remove wasted space.

Other restrictions are also applied: users cannot view, edit or create forms, reports or modules in Design mode, nor can they import or export forms, reports or modules. However, tables, queries, data access pages and macros can be imported from or exported to a non-.mde file, and you can also import these components into an Access database.

You cannot return an .mde file to the .mdb format so it's very important to keep a copy of the original database to enable you, as the code-writer, to modify the design of the application. Once changes have been made, keep a copy and then create a new .mde file.

There are certain conditions which prevent an application from being saved in the .mde format, and one (or more) of these may be preventing Richard from saving his file. For instance, a replicated database will

Word checks that you're happy for complex formatting to be removed from the batch file under construction

This simple query, SortbyCDID, applies order to a table of data by including all fields then sorting on the Autonumber ID field

need its replication system tables and properties removed first, and if a database makes reference to another database or an add-in, these must also be saved as .mde files.

Furthermore, if user-level security settings have been applied to the database, you'll need to check that they meet the various criteria outlined in the help system (type "MDE file" into the Answer Wizard – in my copy of Access 2000 help, .mde doesn't figure in the Index – and inspect the "Work with MDE files" option). You'll also need password access to the VB code.

Hopefully, exploring these avenues will give Richard the result he wants.

Dos lives

In the May issue I revitalised the old DIR command from Dos, using it to generate a list of .jpg files stored on disk and saving the result as a text file. The command is:

```
DIR *.JPG /S /B >PENGUIN.TXT
```

(Key: ✓ code string continues)

which lists (using the DIR command) all the .jpps (*.JPG) in all folders (using the /S switch) and showing the complete file names (the /B switch) and saving (>) the result to a text file called PENGUIN.

This text file was then imported into an Access table, giving a list of all .jpg files.

Shannon O'Hara uses Access and Publisher 2003, the latter program prefers full pathnames. Shannon emailed to suggest a further refinement. Shannon says that if finding full pathnames is something you do frequently, it is worth saving

the Dos command as a batch file. A batch file is simply a stored series (or batch) of Dos commands which can be run time and time again like a tiny program – in fact, it is a tiny program.

Batch files are created using the editor of your choice (Word is fine, or Notepad). You type in the commands, one per line, just as you would type them in the Dos command window. Our batch file comprises the single command given above, typed into a Word document: save the file, setting the file type to be plain text (.txt), typing in a name – FINDJPG – and changing the file extension from .txt to .bat. Any file with the .bat extension is treated as a program file and is run, rather than opened, when you double-click it.

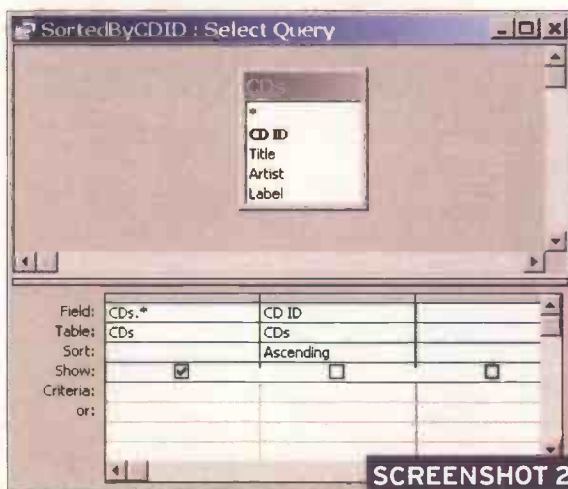
Word will throw up a dialogue warning that all formatting, pictures and so on will be lost when the file is saved, which is only what we'd expect from the plain text format. You can accept the text encoding setting of Windows (Default) or change it to MS-Dos – both work (see screenshot 1). Click OK and your batch file is complete.

Double-clicking the file name from Explorer or putting a shortcut to the file on the desktop gives much quicker results than starting from a Dos box each time. The old Dos skills are still occasionally handy, even in these Wonderful days (which reminds me of talking to a naval officer recently: I was interested in the computer systems used on his ship, particularly the operating systems. So I asked if they had any intention of moving to Windows. He looked me straight in the eye and replied 'No, we still use portholes...').

Order, order

Geoff Tuffnell has a table listing his CDs with fields such as Artist, Title, Label and so on. He has also (very sensibly) added an Autonumber field that contains a unique number for each CD. He hasn't sorted or indexed the data, and when he opens the table the data is in the order in which it was entered.

He created a simple report, using a wizard, to produce a titled list of CDs showing their unique ID, artist and title, using default settings wherever possible. What puzzles him is that the report lists the records as follows: 1-3, 5-47, 67-113, 4, 48-66





The reason for this is that database engines (such as Access) have no interest in the order of the rows in a table. They don't give a fig about order unless you give them explicit instructions to care about it.

(OK, they aren't really sentient so, not only don't they care about the order of the rows, they don't care about anything. However, a little anthropomorphism never hurts when trying to explain the behaviour of computers. Indeed, one of my current favourite jokes goes: Don't anthropomorphise computers... they hate it.)

The revelation that databases don't care about row order immediately raises a sequence of questions.

'But the rows have to come out in some kind of order, so what determines that order, and why isn't it consistent?' The answer is that the query optimiser part of the database engine is completely uninterested in order, but very interested in speed. It tries to find the fastest way to answer your query and the order in which it spits out the rows is a byproduct of that decision.

For example, even when you simply open a table, you are, in fact, running a query. The query is completely masked by the user interface but, when you double-click on a table called CDs in Access' Database window, the SQL statement: `SELECT * FROM CDs` is run and it returns all the records in a table called CDs. The SQL statement is sent to the query optimiser part of the database engine, and the optimiser determines the fastest way to return the answer. In the case of "SELECT * from CDs", this will probably be a so-called 'sequential read' of the table. This read starts at the beginning of the table, reads to the end and presents the data. Records in a table with an Autonumber field are likely to be stacked in Autonumber order on disk, so the data is returned by the query optimiser in that order. This is the behaviour Geoff sees when he opens the table and finds the data in the order it was entered. As long as no other sorting is applied, this order is reproduced whenever the table is inspected, because the optimiser always reaches the same conclusion about the fastest way to display the data.

There is, however, no guarantee that the same order will be returned given even the slightest change in the way a question is asked. If, for instance, you create a report to show all the records (even though you expect to see exactly the same set of

Sorted By CD ID

SCREENSHOT 3

CD ID	Title	Artist	Label
1	Tunnel Vision	Hedge	City Cuts
2	Basement Blues	Hedge	City Cuts
3	Clouds in my eye	Atacama	PDQ
4	Rootloftops	Fenny Brooks	Kouger
5	Where you comin' from?	Loudness	ArtAnt
6	Red Brick	Atacama	PDQ
7	College Rock	Atacama	ProgKnot

SortedByTitle

SCREENSHOT 4

CD ID	Title	Artist	Label
2	Basement Blues	Hedge	City Cuts
3	Clouds in my eye	Atacama	PDQ
7	College Rock	Atacama	ProgKnot
6	Red Brick	Atacama	PDQ
4	Rootloftops	Fenny Brooks	Kouger
1	Tunnel Vision	Hedge	City Cuts
5	Where you comin' from?	Loudness	ArtAnt

records as you did when simply opening the table), the query optimiser may come up with a different optimal way to return a rapid response. This is what Geoff is seeing with his report: mostly the records are sorted by Autonumber order, but with odd exceptions.

This is a potential problem: human beings like order and they also like it to be consistent. The answer is to take control. Every time you care about the order, make sure you tell your faithful servant, the database engine, exactly what you want. This means building a query that specifies the order, like the one shown in screenshot 2, called SortedbyCDID.

Now when you write a report, you base it upon this query rather than upon the table itself and the

Screenshot 3:
This report is based on the SortedbyCDID query and guarantees that records appear in Autonumber order – that is, the order in which they were entered

Screenshot 4:
This report is based upon the Sortedbytitle query which, as you'd expect, sorts CD records alphabetically by title

order you specify will be carried through into the report and consistency is guaranteed (see screenshot 3). Furthermore, you could build another query to, perhaps, sort CDs into an alphabetical list by title, and basing a report on it will produce a neat report sorted in that way (see screenshot 4).

The moral of the story is that, whenever the ordering of records matters to you, you must tell the database what you want so that it can give it to you. (In fact, there is more than one way to order the data in a report – see Carl Wade's problem in this month's Question time section.)

As a side issue, to return briefly to the design of the query, I've used the asterisk symbol in the first column to include all fields, but I've also included the CD ID field in the second column. The Ascending sort order is applied here and the column is hidden from the answer table. The asterisk tells the query to return every field in the table without having to name them explicitly. If you add a field or change the name of an existing field, this query will still work. If you specify each field individually in the query, it would have to be edited manually to reflect any such changes to the underlying table.

On the other hand, the downside of my query is that it does return every column, which is inefficient if there is a large number of columns. So, you can have adaptability or speed – the choice, as ever, is yours.

This month's mdb file (available from the cover disc or from www.penguinsoft.co.uk) contains sample data: a tiny table, two queries and a report.

Automatic compaction

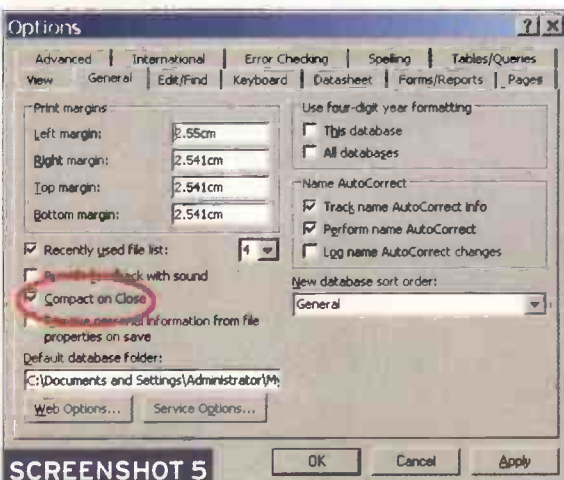
In May's Question time, Sarah Richardson asked about the size of Access files. I suggested using the Compact database utility. Sanjay Mehta wrote in to say that compaction can be performed automatically on closing the database.

Open the database, then choose Tools and Options. Select the General Tab and tick the Box called 'Compact on Close' (see screenshot 5).

It's an excellent suggestion and an option that I didn't know about.

CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: database@pcw.co.uk. Please do not send unsolicited file attachments.



SCREENSHOT 5

Automatic compaction at the flick of a check box



Tim Anderson
Is both an IT journalist and software developer, and began writing for *PCW* in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the Internet

Taking a team approach

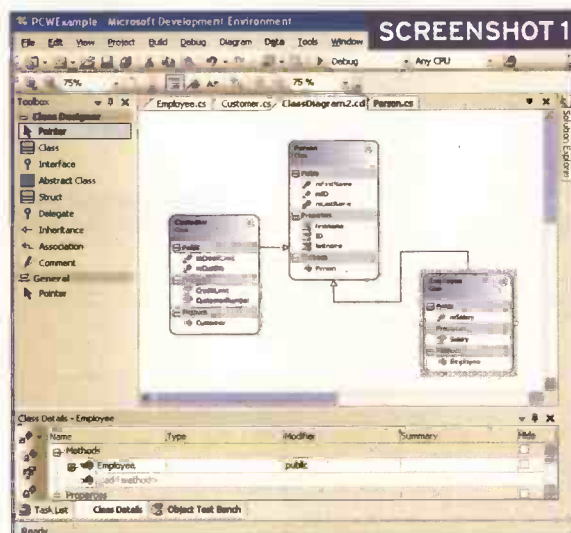
A look at Microsoft's new Team System, and how to do secure login with ASP.Net

At the US Tech-Ed conference earlier this year, Microsoft announced a major change to Visual Studio .Net, its all-encompassing development tool. The 2005 version, due out in the first half of next year, will include the Visual Studio Team System, including a brand new source code control system to replace Visual Sourcesafe, profiling and code-coverage tools, task management and bug tracking, unit testing, visual class design (see screenshot 1), refactoring, and an innovative 'design for deployment' modelling tool that lets you verify that a distributed application will run on the target hardware and software. These kinds of tools are known as software lifecycle tools, because they address the entire development process rather than just coding and debugging. In the past, Microsoft has almost ignored such things, leaving it to third parties to fill the gap, while Visual Sourcesafe has never worked well in large teams or over a wide area network.

The new system is more suitable for team members connecting over the Internet, since it is based on a web application called Team Foundation Server, and presents its API using XML Web Services. Visual Sourcesafe will still be available for very small teams that do not use a Windows server. It's good news for .Net developers and is Microsoft's response to increasing competition from Java tools such as Eclipse and JBuilder. It is less clear whether the vendors such as Borland and Compuware, which currently sell modelling and team development tools for Visual Studio, will win or lose from the new system. Those I spoke to at Tech Ed said bravely that Microsoft is validating their market, and that the new system provides hooks that enable them to integrate enhanced add-ins. On the other hand, many developers may be content with what will be in the box.

ASP.Net secure login

Microsoft's ASP.Net technology lets you easily create data-driven web pages, such as the RSS newsfeed shown in last month's Visual programming column. A key issue for any data-driven site is how the data gets updated. In some cases, you



Visual Studio .Net 2005 sports an array of new development tools including a visual class designer which synchronises with the code

can update a database locally and simply upload it to a website from time to time, but this approach is inconvenient and will not work if you want website users to be able to update the data themselves. It is unlikely that you want anonymous users to write to your database so, before tackling the database aspect, it makes sense to look at creating ASP.Net pages that require secure login, either just for you as administrator, or for any number of users you permit.

There are four ways to authenticate users in ASP.Net. First, you can roll

'Although there are several steps, ASP.Net Forms Authentication is flexible and requires little code'

your own scheme by writing code to compare user names and passwords and redirect users accordingly. There's nothing wrong with this approach, but it can involve a fair amount of work and is more error-prone than using a built-in scheme.

Second, you can use Windows authentication, which means your users must have entries in Active Directory. This works well for an intranet, but not for a public website.

Third, you can use Microsoft Passport, which requires installing the Passport SDK, registering your site with Microsoft, and possibly paying a fee, ruling it out for many.

Fourth, you can use Forms Authentication, which is the most practical technique for public websites. Here's a look at how it works.

Forms authentication

There are two distinct elements to any secure website. One concerns the transmission of data between the web server and the client. Normally data is not encrypted, which means there is the potential for interception en route. If you are running an ecommerce site or dealing with highly sensitive data, you will want the data encrypted, which normally means using HTTP over SSL (secure sockets layer). Many ISPs will provide this as a premium service. It does not much affect the ASP.Net application itself, except that the Request object has a handy `isSecureConnection` property, which you can query to detect whether the current connection is encrypted or not. If you have full access to the Internet Information Services configuration, you can specify that a particular virtual directory must only be accessed using SSL.

The next thing to look at is the website configuration file, `web.config`. This is an XML document that resides in the root directory of your ASP.Net application, and optionally in subfolders as well. The `web.config` in a subfolder inherits any `web.config` instances in parent folders. If you want to secure some pages but not others within the same application, you can do so either by using subfolders with their own `web.config`, or by using a location element in the root `web.config`. Here's how to do it using separate config files. You can test the example and view the code at www.itwriting.com/pcw.

Editing web.config

The first step is to edit `web.config` for the application root. Note that Visual Studio creates a `web.config` file for every ASP.Net project, providing a useful commented example. The element to look at is `<authentication>`. It can only be set in the root `web.config` for the application, and it should look something like the following sample `web.config` file:



```
<authentication ✓
mode="Forms">
<forms name="LoginForm" ✓
loginUrl="login.aspx" ✓
protection="All">
<credentials ✓
passwordFormat="SHA1">
<user name="Tim" ✓
password="ASDF..." />
</credentials>
</forms>
</authentication>
```

(Key: ✓ code string continues)

This example sets the authentication mode to Forms and defines a login page. ASP.Net will automatically redirect to this page when authentication is required. The <credentials> element is optional, and provides an easy way to list a small number of users within the config file itself. The passwordFormat attribute can be set to Clear, MD5 or SHA1. Clear is less secure, since the passwords are listed in plain text within the config file. The other two options require the password to be hashed. The hash is one-way, so even reading the config file does not reveal the password. Hashing passwords is easy: see the box above right for details. If you have a large number of users, you will want to store user names and passwords in a database. To do this, omit the credentials element completely.

You have now set up authentication, but if you stick this config file on your website, users will still have free access to all the pages. The reason is that ASP.Net defaults to allowing anonymous users throughout. To limit access, you need to edit the <authorization> element. In this example, there's no need to limit access to the whole application, but only to a subfolder, so create a new web.config for the folder in question. Here's an example <authorization> element:

```
<authorization>
<allow ✓
users="PCWReader"></allow>
<deny users="*" /> ✓
<!-- Deny all users -->
</authorization>
```

It's vital to have a clear understanding of how ASP.Net decides whether to allow access. What it will do is to run down the <allow> and <deny> rules in order, until it finds one that fits the current authenticated user. It will use the web.config for the current folder, followed by that for the parent folders, followed by the <authorization> element in machine.config which sets the default for the whole system. The above example allows access only to the user

PCWReader. If the <allow> and <deny> elements were reversed, nobody would get access, since the <deny> matches all users. Another thing to note is that you can allow access to any authenticated user, but not to an anonymous user, with the following:

```
<deny users="*" /> ✓
<!-- Deny anonymous ✓
user -->
<allow users="*"></allow>
```

This lets you do your own custom authentication – for example, by using a database.

Creating a login page

The final step is to create a login page. The page URL is specified in the <forms> sub-element of the <authentication> element, so in this example it is login.aspx. Create a Web Form with two TextBox controls. Set the IDs to txtUsername and txtPassword. For the password control, set the TextMode property to password, so that the password is never displayed. Next add a label called lbError, and set its visible property to False. Finally, add a button with the following code (a login handler for ASP.Net) for the click event handler.

```
If (FormsAuthentication.✓
Authenticate(txtUsername.✓
Text, txtPassword.Text)) ✓
Then
FormsAuthentication.✓
RedirectFromLoginPage✓
(txtUsername.Text, False)
'Or use true to set a ✓
cookie for future access
Else
lbError.Text = "Login ✓
failed, please retry"
lbError.Visible = True
End If
```

You will also need to add:

```
Imports ✓
System.Web.Security
at the top of the code-behind file.
```

How to hash a password with .Net

You can hash a password for an ASP.Net config file with just a few lines of code. To do so, start a Windows Forms project in VB .Net. Right-click the project name in the Solution Explorer, choose Add Reference, and select System.Web. Next, add two textboxes and a button to the form. Double-click the button and type the following code for the Click event handler:

```
TextBox2.Text = ✓
FormsAuthentication.HashPasswordFor✓
StoringInConfigFile(TextBox1.Text, ✓
"sha1")
```

Now scroll to the top of the code and add the following before the Class declaration:

```
Imports System.Web.Security
```

Run the project, type the password into the first textbox, click the button, and the hashed value appears in the second textbox.

This ASP.Net logon page appears automatically when set as the logon page for Forms Authentication

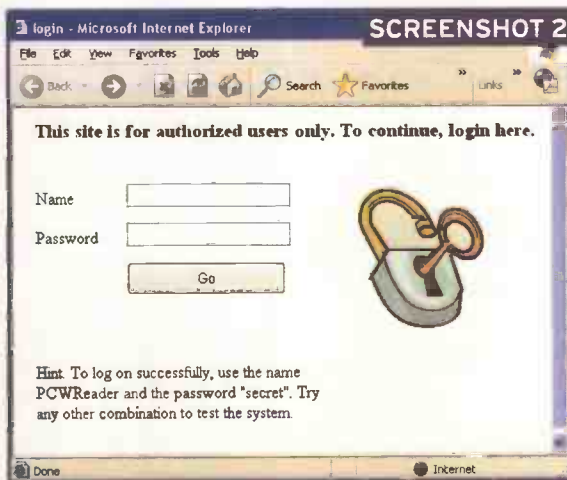
That's it. Now, whenever a user requests a page in the restricted part of the site, they will automatically be redirected to the login page. When a valid username and password is entered, they will be redirected to the page originally requested. Note that the code is crucial. For example, if a user entered the wrong password, but your code failed to check and simply called RedirectFromLoginPage with the username, ASP.Net would still authenticate the user. In other words, with Forms authentication it is your code that decides whether the user is authentic. This is good as it lets you use a database query instead of relying on the credentials in web.config. If you do use the web.config credentials, you must call FormsAuthentication.Authenticate to verify the password. Another important point is that Forms Authentication only covers resources that pass through the ASP.Net parser, which means ordinary HTML pages or images are not covered.

Although there are several steps involved, ASP.Net Forms Authentication is flexible and requires little code. It will be even easier in ASP.Net 2.0, which has built-in classes and controls for user management. Once you have secured your pages, you can set up member-only sites and create admin pages for updating data.

Code for the ASP.Net secure logon project is at www.itwritting.com/pcw.

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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LOADING...



Return of the Prince

Ubisoft has announced a sequel to the highly acclaimed Prince of Persia – The Sands of Time. Prince of Persia 2 (working title) will build on the successes of its predecessor, incorporating a new free-form fighting system and a variety of new weapons.

The story follows the adventures a prince who embarks on a dangerous quest to defy his preordained death. His journey takes him through a variety of landscapes, including the core of a cursed island stronghold. As before, you'll be able to manipulate time. If you fall off a ledge, for example, you can rewind the game to the point you require and avoid repeating such a fatal error.

Prince of Persia first wowed gamers in 1991 with its blend of sophisticated animation and advanced gameplay. The most recent update brought the franchise up to date with lush 3D environments, making it one of the most acclaimed games of 2003.

Harry Potter: Prisoner of Azkaban

Plenty for young players to enjoy, but not a very challenging game



Harry Potter and the Prisoner of Azkaban is loosely based on the movie of the same name, which in turn is based on JK Rowling's childrens' novel. For the uninitiated, the game recounts Potter's third year at Hogwarts School of Witchcraft and Wizardry, which is threatened by the escaped prisoner Sirius Black.

The game doesn't tie in perfectly with the movie. For the most part, the developers have created an original adventure that takes only the main plot elements from the film. The remainder is fairly derivative, with elements borrowed from established titles such as Nintendo's The Legend of Zelda.

For the first time in the series, players can take control of Potter's compatriots, Ron and Hermione, as well as Harry himself. They each have their own strong points. Ron can use the Lumos spell to shine a light on enemies (handy in certain situations), while Hermione can animate lifeless statues or use her Glacius spell to cool things down.

Progress is achieved by completing quests. These vary from attending Hogwarts classes and finding key items, to helping

people in need. Once a section is complete, players can advance to the next chapter of the story or explore sections of Hogwarts.

The game does a good job of recreating the Harry Potter universe. Characters are well rendered and the voice acting, despite occasionally cheesy dialogue, is of a high standard. Many spot effects sound a little samey, but amends are made thanks to a strong musical score.

For young or inexperienced gamers, the game has a well-judged learning curve, but older players may find the puzzles and combat elements a little too easy. Most enemies, for example, can be dispatched simply by

clicking the mouse button, while performing spells is a far less complicated affair than in the previous games. Whereas past games required you to draw specific outlines with the mouse to perform a spell, they can now be performed with a click. This leads to a feeling that the player is being taken through a tutorial for a more difficult challenge later on, which never arrives.

Prisoner of Azkaban is probably the best Harry Potter game in the series. If you're a fan of the books, there's plenty to get excited about. Look past the license though, and there's ultimately little to help it stand out from the myriad 3D action titles that saturate the market.

Rory Reid

DETAILS

PRICE £29.99 inc VAT
CONTACT EA www.eagames.com
SYSTEM REQUIREMENTS

Windows 98SE/2000/XP • Pentium III 600 or Athlon equivalent
• 256MB of Ram • 32MB Direct3D Accelerated Card • Windows-compatible sound card (100 per cent DirectX 9 compatible) • Eight-speed (8x) CD-Rom drive • 850MB of free disk space

VERDICT

Lack of a challenge limits appeal for more experienced players

OVERALL

★★★★★



Most enemies can be dispatched simply by clicking the mouse button



Competitions

Win a subscription to Tiscali Broadbandx10 or a 19in Sony monitor

Turn to page 208 for a chance to win one of five broadband subscriptions, or one of two Sony SDM-S94 monitors



Painkiller

These pains require more than paracetamol



Whereas it used to be acceptable for a first-person shooter to have a few zombies and ghouls waiting to be taken down with some fantastical weapon, players now want sophisticated artificial intelligence and enemies that think like humans. Titles such as *Far Cry* and *Call of Duty* have pushed the boundaries of game programming, offering super-realism and evolved enemies. And although these are undoubtedly classics of the genre, it's refreshing to get back to basics and play something dumbed down sometimes.

Painkiller is such a delight, an unashamedly simple offering that's a joy to play. It's set in a spiritual no-man's-land between Heaven and Hell, a perfect setting for a gruesome selection of enemies, all keen to eat you alive.

You'll immediately be struck by the superb graphics. The animation is excellent, and the backdrops are textured and packed with details that impress throughout. It's brutal and wild, but entertaining to watch Hell's warriors shredded to pieces, then shot again for good measure.

The levels are lifted straight from any macabre horror movie, with eerie churches and freakish asylums as settings. They may not be the most

original locales but they look and sound very atmospheric, and you can't help but be drawn in to *Painkiller*'s twisted world.

The weapons list is limited compared to the average first-person shooter, but the range of enemies you face ensures you never tire of using them. Learning how to take down the various otherworldly critters is part of what makes it so much fun. And despite the limited gameplay paths, it never gets dull due to the many surprises.

It's more visceral than cerebral, but when it's this polished and playable, and looks this good, you really shouldn't be churlish. If you can stomach the blood and guts, it is highly recommended.

Eddie Henderson

DETAILS

PRICE £29.99

CONTACT

www.dreamcatchergames.com/dci/painkiller/index.html

SYSTEM REQUIREMENTS

Windows 98 or above • 1.5GHz Pentium III • 384MB of Ram • 1.2GB of hard disk

VERDICT

An intense first person shooter that comes highly recommended, provided you can stomach all the blood and guts

OVERALL

★★★★★

Runescape

An accessible and enjoyable online RPG



Runescape is an online multiplayer role-playing game (RPG) that can be played by anyone with a PC and an Internet connection. The game is split between a free edition, subsidised by advertising, and a subscriber version, featuring a larger game environment and a wider variety of storylines (quests).

Players use a point-and-click interface. Despite the hardcore image of multiplayer online games, *Runescape* is accessible. A tutorial provides a basic guide to survival, so you'll be making fires, preparing health-restoring food and mastering basic combat in minutes.

As with similar games, the key to success is gaining experience. Adopting a defensive posture in battle makes your character better at blocking, whereas a more aggressive approach develops more powerful attacks.

The technology behind *Runescape* is impressive. The graphics are a far cry from anything you'd expect of a modern title, but its 3D engine is superior to anything we've seen so far in a web-based game. Players can zoom the camera towards or away from their character, rotate it in order to get a better view at specific objects and talk to other players.

This chat element is part of what makes *Runescape* so appealing. Tens of thousands of players can take part at any one time; choosing to go it alone, make alliances, or simply hang out in groups learning from more experienced players.

Unlike RPGs such as *Final Fantasy*, *Runescape* has no discernible storyline. Players exist simply to improve their character's experience points, with no tangible conclusion. There are quests to embark on (with new ones added regularly), but these subplots may not be enough for the average player. Despite this, *Runescape* remains a very solid and enjoyable multiplayer RPG.

Rory Reid

DETAILS

PRICE \$5 (£2.73) per month

CONTACT

www.runescape.com

SYSTEM REQUIREMENTS

Microsoft Windows 98SE/2000/XP • Pentium II 300 or Athlon equivalent • 64MB of Ram • Windows-compatible sound card

VERDICT

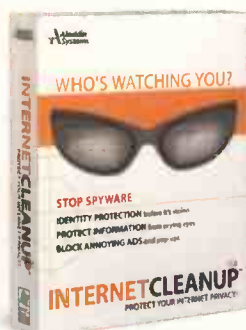
Despite being a web-based game, *Runescape* is a very solid, enjoyable role-playing title with highly immersive gameplay

OVERALL

★★★★★

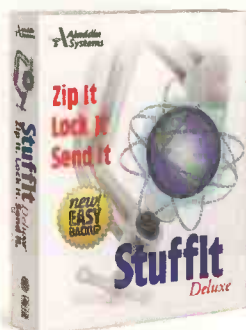
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The Portfolio was the first Dos-compatible handheld ever launched

Atari Portfolio

How the original Dos-compatible handheld device from Guildford helped save the world

John Conner inserts a modified credit card into the ATM and glances nervously over his shoulder; the card's connected by a ribbon cable to a handheld computer that starts spitting out Pin-code combinations. Seconds later the code's cracked and machine coughs up \$300.

This sequence in *Terminator 2* is fondly remembered by retro technology lovers because Conner uses what's clearly an Atari Portfolio handheld; he even uses it later in the movie to break into a company vault. While the jury's still out on the Portfolio's ability to crack codes or commit crimes, the handheld unit was the smallest Dos-compatible machine the world had ever seen. While launched by US giant Atari, most people were unaware that the Portfolio was in fact licensed from a small company in Guildford.

In the late 1980s, Atari, like many computer manufacturers, began to look into producing IBM-compatibles. The Tramiel family, who ran Atari, believed handheld machines could be a lucrative market. Few would have guessed both goals could be achieved by a single product.

In 1988, Distributed Information Processing of

Guildford, or DIP for short, was working on a prototype for the world's first pocket-sized IBM PC clone. The prototype, which DIP called the Pocket PC, employed a series of custom-built chips and a low-power CMOS version of the Intel 8088 processor used in the first IBM PCs. DIP boasted a proven track record in portable computing with managing director David Frodsham and development director Peter Baldwin both having previously held senior positions at Psion. However, no-one in the UK could provide the required investment.

Baldwin began pitching the handheld to companies outside the UK, including Sharp and various parties in the US. Atari proved very receptive, being interested in handhelds and having already worked with UK labs in Cambridge on its Transputer workstation, and the company agreed to license DIP's handheld technologies.

Donald Thomas, who'd previously worked at Federated Technology Stores, a retail chain Atari hoped would compete with Radioshack, was rehired to lead a small direct sales and support division for the new handheld.

Baldwin returned to the UK and DIP began finalising the specification with input from

Atari. The production DIP Pocket PC would be powered by an Intel 80C88 processor clocked at 4.9152MHz. It featured 128KB of memory configurable as a Ramdisk, while the operating system and supplied application software were stored in a separate 256KB Rom. The monochrome supertwist LCD ran at a resolution of 240 x 64pixels, which translated into eight lines of 40 characters.

There was a calculator-style Qwerty keyboard, a small loudspeaker that could generate phone dialling tones, and a memory card slot. An optional parallel port adapter allowed you to transfer files to and from a PC, while a serial adapter could be used to communicate with a modem. The whole thing was powered by three AA batteries, which could last for around 40 hours of normal use.

Crucially, DIP had produced what could be described as the first handheld Dos-compatible machine. The company's own-developed DIP Dos 2.11 was compatible with Microsoft Dos 2.11, and several of its built-in applications could read and write popular PC formats. There was a text processor, contact book, time manager and a spreadsheet which could open and save files

compatible with Lotus 1-2-3. Admittedly the display resolution and limited memory prevented you from running most Dos applications designed for a desktop PC, but its capabilities were still impressive.

Perhaps most impressive was its size. At 200 x 100 x 28mm, the folded clamshell design was roughly the size of a VHS video cassette and weighed just 454g without batteries. This was a degree of portability unknown to anyone working with PC files.

Branded as the Portfolio, it was launched in 1989 for \$399. It became Atari's best-known PC-compatible and enjoyed a raft of peripherals and software. There were rumours of more powerful models being developed, including a version with a CGA colour display, but none were launched. DIP later developed handhelds for companies including Sharp, before its research arm was bought by Phoenix Technologies to develop Bioses for handheld devices.

The original Portfolio will, however, be remembered not just as the first handheld Dos-compatible, but the computer which helped save mankind from the rise of the machines. And it all began in Guildford.

Gordon Laing

Five one-year subscriptions to Tiscali Broadbandx10

If you're still connecting to the Internet with a dial-up modem, you've probably never taken full advantage of the Internet. This month, we're giving five readers the chance to win a year's subscription to Tiscali's super-fast Broadbandx10 service.

Broadband provides high-speed, always-on Internet access. An always-on connection means that you don't have to dial up every time you want to surf the web. Plus it keeps your phone line free, which means you and your family can make calls while you are online. With Tiscali Broadbandx10, there are no Internet call charges so you can use it as much as you want, whenever you want.

You'll also be given access to Tiscali's high-quality Internet content. You can keep abreast of the latest happenings in the world of sport with daily bulletins; keep up to date with what's going on in the world with the news channel; play cool online games; and download the latest music videos 10 times faster than with a dial-up modem.

To be eligible for winning, visit http://www.tiscali.co.uk/products/broadband/check_availability.html to see if you live in a broadband-ready area, then answer the question below and follow the how to enter instructions:

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- c) 10x



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Rules of entry

This competition is open to readers of PCW, except for employees (and their families) of VNU Business Publications, Tiscali and Sony. 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.

July winners

The winner of Far Cry and a PC World voucher is D Sidhpura from Kent.

The winners of the Sapphire graphics cards are: John C Rimmer, D Reece, Mrs L Radford, Mr A May, Peter Lake and Mr Grant Muddiman.

Two 19in Sony SDM-S94 monitors

SONY

We've teamed up with Sony to give two readers the chance to win a 19in SDM-S94 monitor. The monitor features digital and analogue signal inputs allowing users to enjoy the best possible image quality. Absolute accuracy is assured, and unwanted effects such as ghosting and instability are eliminated so you'll be able to play your DVDs and games with superb image quality.

As with every Sony product, the S94 is designed with keen attention to detail. The choice of cabinet styles allows users to select between two carefully matched silver and black colour schemes to suit their working environment. Less noticeable, but potentially very important, is the super-slim bezel, created to allow multiple monitors to be used as an array with minimal visual interruption between screens.

The SDM-S94 operates at a native SXGA (1,280 x 1,024) resolution, providing a spacious working environment. High brightness and contrast and a superior anti-reflective screen surface complete the picture, ensuring that the display delivers consistent image quality under a wide range of conditions. Sony's unique ECO-Mode feature gives users the ability to select the ideal brightness for any application or lighting environment in seconds, so avoiding potential problems arising from poor ergonomics. To be in with a chance of winning, just answer the question below and follow the instructions on how to enter:

What is the SDM-S94's native resolution?

- a) 1,024 x 768
- b) 1,280 x 1,024
- c) 1,600 x 1,200



How to enter

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Black Colour

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Desketjet 610/612/640	(6614D/49A) £17
Desketjet 610/610/PCS500	(6615D/23D) £17
Desketjet 816/825/840/845	(6615D/25A) £17
Desketjet 920/940/V40/V45	(15D/6578D) £17
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Desketjet 820/50/70/1100	(45A/41A) £17
Desketjet 720/815/890/1120	(45A/23D) £17
Officejet T45/T65/R45/R65	(45A/23D) £17
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PhotoSmart P1000/P1100	(45A/78D) £17
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Desketjet 2200/2250	(44A/36C/37M/38Y) £22
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Desketjet 5550/PS7000Series	(56A/57A) £12
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HP A4 Paper Media

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Premium+ Photo Glossy	(C6832A) £20
Premium+ Photo Matte	(C6951A) £20
Premium Glossy Photo	(Q1992A) £10
Premium Glossy Paper	(C3831A) £10
Premium HeavyWeight 2-Side	(C1853A) 100
Photo Quality Inkjet Paper	(C6984A) £20
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HP A3/A4 Paper Media

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HP A3+ Proofing Paper Media

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HP Laserjet 1200 / 1220	High Yield (C7115X) £45
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HP Laserjet 2300	(02610A) £66
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HP Laserjet 4300	High Yield (C1339A) £109
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A4 Premium Glossy	(41287) 20
A4 Premium Glossy	(41624) 50
A4 Premium Semi-Gloss	(41332) 20
A4 Glossy Photo Weight	(41349) 20
A4 Photo Glossy	(41126) 20
A4 Photo Glossy	(41620) 50
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A4 Photo Paper	(41622) 50
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A4 Matte HeavyWeight	(41256) 50
A4 Matte H/W Double Sided	(41569) 50
A4 720/1440 Dpi Photo Quality	(41061) 100
A4 Transparency	(41063) 30
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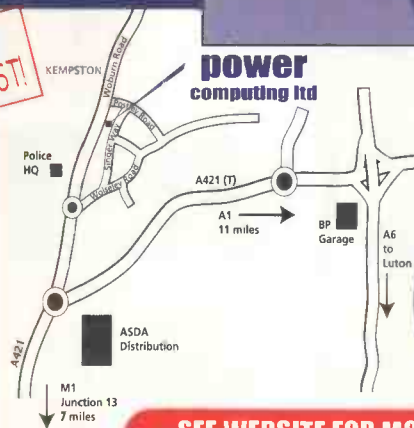
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Universal 2.4GHz/5GHz Wireless Access Point	smc2555waguk	£399.00
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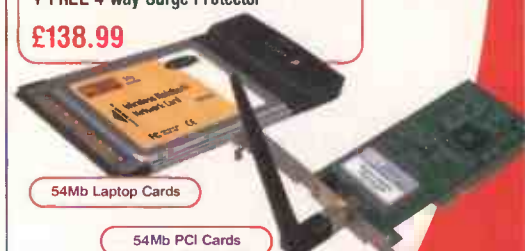
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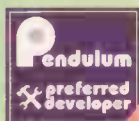
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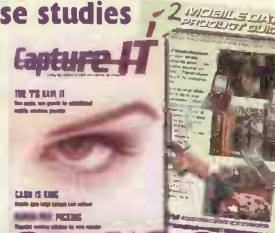
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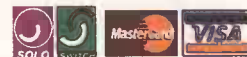
inkcycle

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Chip installed - ready to print



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As one of Europe's largest manufacturers of recycled inkjet cartridges, inkcycle continues to re-invest its profits into research and development. We design and develop our own ink jet cartridge processing equipment and automated MaxFill® production processes.

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VAT INCLUSIVE PRICING**

"Our refilled cartridge had a 45ml capacity and was supplied by inkcycle. The extra capacity made us expect a much bigger yield and we were not surprised by the 2052 pages it managed. The larger refill cartridge achieved over 1300 extra printed pages but cost £10 less than the smaller HP cartridge. The text quality was very similar and we found it hard to tell the original and the third party prints apart."

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Empty inkjet cartridges are valuable; they can be recycled many times. Inkcycle guarantees that every ink jet cartridge we recycle helps reduce landfill and improve the environment for everyone

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No Quibble
Guarantee
On All
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Price Promise ✓

"We constantly monitor our prices to ensure we offer you the best value, should you happen to find any of our Epson compatible cartridges cheaper elsewhere, we will beat it by up to 10%!"

We Will Beat It! ✓

✓ EPSON Compatible Cartridges - Special Multipack Savings

We are **6** years old this summer and to celebrate we bring you **6** colour Epson compatible cartridges & **6** black Epson compatible cartridges at



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Epson Devil's Dozen (6 black & 6 colour) standard compatibles.

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Our prices are always low - by 'phone or online!
Call/visit web for lowest priced individual cartridges.

limited period offer

EPSON Compatible Cartridges

These Epson compatible cartridges are made to ISO9000 standards and are guaranteed to be equal to, if not better quality, and have the same amount of ink as the manufacturer's original.

Multipack savings available for most of the Epson Stylus standard range including:-

TWIN	1 Black & 1 Colour	£ 4.29	C20/C40/ 200/300/ 400/440/ 450/480/ 500/580/ 600/640/ 680/720/ PhotoEX/ 700/740/ 750/760/ 800/850/ 850/880/ 1160/1200/ 1520/Pro/ ProXL/ ProXL+/ ColorLites/ SCAN200/ 2500/more.
QUAD	2 Black & 2 Colour	£ 7.50	
MONO	5 Black + Free Black	£ 7.99	
COLOUR 5	Colour* Free Colour	£12.99	
D QUAD	4 Black & 4 Colour	£14.49	
MEGA	8 Black & 8 Colour	£28.49	

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TWIN	1 Black & 1 Colour	£ 6.99	C42/C42+/ C42UX/ C44/C44+/ C44UX/C50/ C60/C62/ C64/CX3200/ 680/777/ PhotoC64/ 790/810/830/ 830u/870/875/ 890/895/900/ 915/925/935/ 950/1270/ 1290/RX500 & lots more.
QUAD	2 Black & 2 Colour	£11.95	
MONO	5 Black	£16.99	
COLOUR 5	Colour	£21.99	
D QUAD	4 Black & 4 Colour	£25.49	
R300	Black & 5 Colours	£23.94	

Call / visit website for prices: C70/C70+/C80/C82/CX5200/CX5400/CX6400 carts.

✓ All Our Inkjet Specialist Papers are 2880 dpi Quality!

Sample Paper Pack

1 x 150g instant dry photo satin /
1 x 140g coated matt /
1 x 140g instant dry gloss /
1 x 180g instant dry gloss /
1 x 140g coated matt /
2 x 210g coated matt /
1 x T-Shirt transfer / 2 x 7 x 5 Photo cards /
1 x Business card sheet / 1 x CD Labels /
1 x A5/A6 Greeting Card

£4.49

Pack contents may vary from time to time.

High Quality CD-R

80 minute 24 speed
25 x CD-R £ 9.99 50 x CD-R £18.99 100 x CD-R £22.99

		Weight	Quantity	Price
A4 Gloss	Photo Gloss	140 gsm	20 sheets	£ 3.98
	Photo Gloss	140 gsm	50 sheets	£ 7.99
	Instant Dry Satin	150 gsm	20 sheets	£ 4.99
	Instant Dry Gloss	160 gsm	20 sheets	£ 6.99
	Instant Dry Gloss	180 gsm	50 sheets	£11.49
	Instant Dry Gloss	210 gsm	20 sheets	£15.00
	Instant Dry Gloss	254 gsm	50 sheets	£11.49
	Instant Dry Gloss	190 gsm	20 sheets	£ 7.99
	Double Sided Gloss	190 gsm	20 sheets	£ 8.99
	7x5 Photo Cards	160 gsm	25 pack	£ 4.99
A4 Matt	Coated Matt	100 gsm	100 sheets	£ 5.49
	Coated Matt	100 gsm	200 sheets	£ 9.99
	Coated Matt	140 gsm	100 sheets	£ 7.29
	Coated Matt	160 gsm	100 sheets	£ 8.50
	Coated Matt	210 gsm	100 sheets	£ 9.99

HP Compatible Cartridges

51626A Black	500/510/520/540/550C/560C	£ 8.95
51625A Colour	310/320/340/540/550/560	£11.75
51629A Black	600/660/690C/695C	£ 9.15
51649A Colour	600/610C/612C/660C/690C/695C	£13.49
51645A Black	710C/720C/820CXI/850CXI/870CXI	£ 8.50
51633A Black	310/320/340	£10.45
C6614ABlack	610C/612C	£ 9.39
C6615ABlack	810C/840C/843C	£10.25
C1823AColour	710C/720C/810C/815C/820C/895C	£13.89
C6578AColour	970CXI/930C/950C/1220C/P1000	£15.49
C6625AColour	840C/843C	£14.89
C6656Black	HP 56	£15.49
C6657Colour	HP 57 (tri-colour)	£16.49
C8727Black	HP 27	£15.49
C8728Colour	HP28	£16.49

LEXMARK Compatible Cartridges

13619HC Colour	1000/1020/1100/2030/2030PE/2050/2050PE3000	£16.46
13400HC Black	1000/1020/1100/2030/2050/3000/4076/Exsjet 11/11C	£15.06
12A1980 Colour	3200/5000/5700/5770/7000/7200/711/231/243	£16.46
12A1970 Black	3200/5000/5700/5770/7000/7200/711/231/242/251/252/253/283/283/283	£15.06
15M0120 Colour	242/243/251/252/253/283/283/283	£17.46
17G0050 Black	212/222/232/J600	£15.06
17G0060 Colour	212/222/232/J600	£16.46

CANON Compatible Cartridges

BC01 Black	BJ10E/BJ10EX/BJ10SX/BJ10v/BJ20	£ 9.35
BC02 Black	BJ200/200e/220e/220ex/230/	£ 9.35
BC05 Colour	BJC150/210/240/250/1000	£12.75
BC20 Black	BJC2000/2100/2110/4000/4100/4200/	£11.99
BCX02 Black	FAX B320/3410	£ 9.99
BCX03 Black	FAX B100/110/MP10	£ 9.99
BJC4000 Twin	2000/4000/5000 (BCI21B & BCI21C)	£ 3.00
BJC3000/6000	Black	£ 2.78
BJC3000/6000	Each Individual Colour	£ 2.78

EDITOR'S CHOICE NOMINATIONS

Choice Stationery Supplies: This company has been extremely popular with readers and the vast majority of feedback we get on Choice highlights the company's prompt and inexpensive service. It remains competitive in a tough market.

James Harding, Editor, Computeractive
Computeractive Reader Awards, 2003



Best
Retailer
2003

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Specialist
Consumable
Supplier
2002

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Prices can fluctuate, please call or visit web site for up to date price and latest offers.

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Major Credit Cards Accepted - No Surcharges!

All Prices are correct at time of print & are subject to change. *Terms & conditions apply.



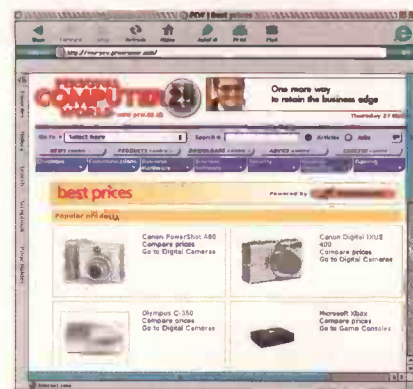
Check out the best prices on

www.pcw.co.uk/bestprices

Whatever you're thinking of buying, from computer hardware to digital cameras, games or phones, your first port of call has to be our online Best Prices service.

Best Prices not only offers comprehensive product reviews and recommendations, but also provides you with up-to-the-minute prices from an unrivalled database of retailers. With the lowest prices listed first, alongside retailers' information on availability, warranties and delivery, this service could save you up to half the normal high street price.

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September Cover Disc

Five pages of workshops, special offers and more >>

On the CD

Fotofinish Basic Edition
Taxcalc 2004 Lite
Maxivista SE
Ace Backup 2003
Ashampoo Winoptimizer Suite
E-txt
Buyer's guide ebook



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:

FAULTY DISC > If the disc is physically damaged and will not load, return it to this address for a replacement:

PCW September 2004 cover disc
ABT, 306 St Mary's Lane
Upminster, Essex RM14 3HL

quoting reference 'PCW Vol 27 No 9'.

PROBLEMS INSTALLING/RUNNING THE SOFTWARE > Check the support page on the disc, or check the manufacturer's site.

GENERAL DIFFICULTIES > Call 08700 885 995 (9.30am to 5pm Mon, Tues, Thurs & Fri; open until 8pm on Wed and 10am to 2pm Sat). Or go to www.vnussupport.co.uk or email us at pcw@vnussupport.co.uk.

On the DVD

Mandrake 10 Official
Suse 9.1 Personal
Fotofinish Basic Edition
Taxcalc 2004 Lite
Maxivista SE
Ace Backup 2003
Ashampoo Winoptimizer Suite & Privacy Protector 1.04
E-txt, Buyer's guide ebook



SOFTWARE LISTING

CD

Full versions

Fotofinish Basic Edition
Maxivista SE
Ace Backup 2003
Ashampoo Winoptimizer Suite
E-txt

Lite version

Taxcalc 2004 Lite

Buyer's guide ebook

Expert buying advice plus thousands of product prices and specs listed

Trial versions

Ace Backup 2004

Acronis Disk Director 9
Actinic 7
Aladdin Internet Cleanup 4
Steganos Secure
Filesharing 6

Group test section

Avast Home v4
AVG Professional 7.250
Bit Defender Pro 7.2
E-trust Antivirus
F-Secure Internet
Security 2004
Kaspersky Personal
McAfee Viruscan Home v8
Norton Antivirus 2004
Panda Titanium 2004
PCcillin Internet Security
Sophos Antivirus

Zone Alarm with
Antivirus 5

Hands on section

Attribute Changer 5
Flash and Pics Control 2.0
FWD EyeP Phone Lite
Gimp 2.01
Hitachi Drive Fitness Test
IRAssistant 3.5
Netremote 0.99
Total Commander 6.03
Unchk 1.3
Vfapiconf 1.05
Virtual Dub 1.5.1
XLite

PLUS loads of freeware and resources

DVD

Everything on the CD PLUS...

Full programs

Ashampoo Privacy Protector 1.04
Artrage

Linux

Mandrake 10 Official
Suse 9.1 Personal

Trial versions

Adobe After Effects 6.5





Need to know

System requirements

Windows 98 or later, 65MB of disk space

Information

www.fotofinish.com

Installation instructions

Go to www.fotofinish.com/register/registerukmag.asp before installation and follow the instructions

Limitations

None

Fotofinish Basic 3.01

View, edit and organise your digital photos

If you're having trouble finding the digital photo you need, Fotofinish could help. It organises your images into albums, where thumbnail previews make it much easier to locate missing shots. And you can view the contents of your album as a slideshow, or set it as your screensaver, with a couple of mouse clicks.

Various options enable you to edit or retouch any image that isn't up to standard. Along with crop or rotate functions, you'll find exposure and colour tweaks, a red-eye remover and range of special effects. Every one shows your image with the effect applied at various strengths, so you can click the one you like best, or just tweak the slider.

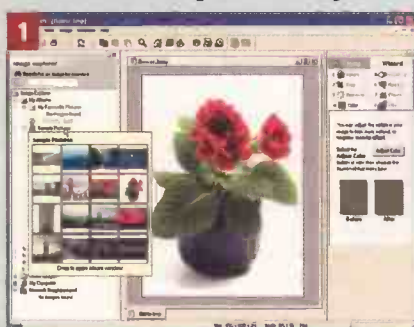
Fotofinish is particularly strong on ways of sharing your images with the rest of the world. Right-click on a picture and choose

'Send by email' to launch your default email client, for instance.

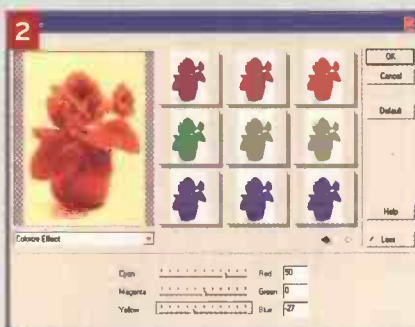
Or pick 'Publish to web' to build an online gallery, using 20MB of free disk space at Fotofinishnet. There's no lengthy registration process, just enter your email address, a password, and the program creates an account for you.

Perhaps the best Fotofinish option is its Print dialogue, which gives you enormous control over your printouts. Layout choices start with a range of thumbnail options, for instance. You can also pick from standard sizes (4 x 6, 5 x 7, 8 x 10), portrait or landscape orientation or even combine layouts on the same page (one 4 x 6 shot, four 2 x 3 images). All these options are available in a single dialogue box or via one straightforward wizard.

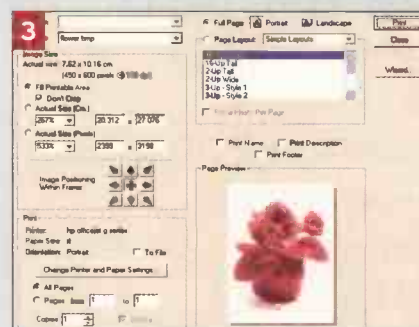
Print out your digital photos



1 First, find your images. Fotofinish can import them directly from digital cameras or scanners (click File > Get Images From...); you can browse your system directly from the Image Explorer, or get the program to locate pictures for you (File > Find Images on My Computer).



2 Next, retouch the image to suit your needs. Click Image > Adjust Colours or Image > Adjust Exposure to correct any problems. And if you're feeling more adventurous, select Image > Special Effects for some interesting alternative ways to present the photo.



3 Finally, click File > Print to customise your printout (select Advanced to see all your print options). Choose 'Standard Sizes' and pick a layout option if you want to produce standard 4 x 6in prints, say, and select 'Album' to print everything in the currently open folder.

Upgrade offer >> Fotofinish Studio & Suite

New features

- >> Layering effects
- >> Flexible selections
- >> Custom shape cropping
- >> DTP features

Move up to Fotofinish Studio and you'll gain powerful new photo-editing features, including layering effects, flexible selections and the ability to crop to custom shapes.

Fotofinish Suite has all the features in Studio, plus enough desktop publishing power to create custom photo cards, collages, invitations, calendars, newsletters and more. Studio is priced at around £55, while Suite costs £72. You can order both online at www.fotofinish.com.





Taxcalc Lite 2004

Let this software handle your tax return calculations

Need to know

System requirements

Windows 98 or later, 40MB of disk space, Internet connection

Information

www.taxcalc.com

Installation instructions

No registration needed. Go to www.taxcalc.com and follow the instructions

Limitations

Maximum income £20,000; employment page only; doesn't produce a paper return

OK, so you've had a busy summer, but September is looming and the nights are getting longer. So it's time to think about completing your tax return.

Hold on, don't turn the page, it really isn't that bad, especially with a little help from Taxcalc Lite 2004. The program uses a step-by-step approach to walk you through every part of the return, so it's difficult to make any mistakes.

Don't worry if you leave one section to fill in later and then forget, because Taxcalc Lite 2004 is watching. Just click on the Check tab and it will highlight any obvious omissions.

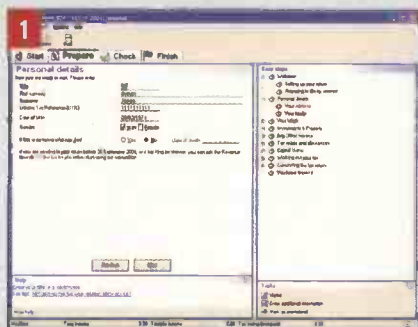
The program even understands the painfully complicated tax maths. Once you've entered all your income, expenses and allowances, it'll immediately calculate

your tax bill. Which is a lot better than letting the Inland Revenue do it, as by its own figures it gets almost half a million tax bills wrong every year.

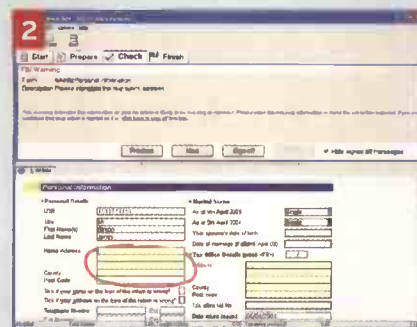
When the return is complete, there's nothing to print or post. Instead Taxcalc submits it electronically to the Inland Revenue and you get confirmation that it's been received. There's no chance of you being fined because the return was 'lost in the post' (or at the Revenue offices).

Don't leave this until the last minute, though, as Taxcalc can't file your return until you've got an activation Pin from the Inland Revenue (<http://online.inlandrevenue.gov.uk>). This may be ordered online, but comes by post, so allow at least three or four working days before you can finish the job.

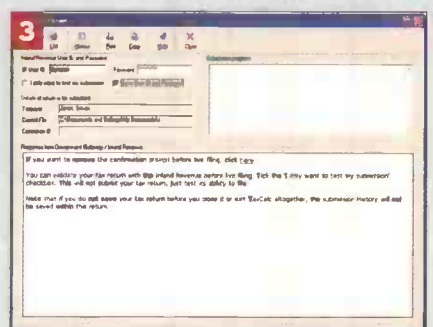
Complete your tax return online



1 Start Taxcalc, and click 'Create a new 2004 Personal tax return'. By default the program walks you through the return using its Easystep wizard, so you just fill in the forms as they appear. Red areas on the Easystep tree show where you've still got work to do.



2 Taxcalc can't trap every mistake (it doesn't know if you earned £1,500 or £15,000 last year), but click on Check and it will flag up areas of the form you've forgotten to complete. The offending section is ringed in red, and a text message explains the problem.



3 Once you've completed the return and fixed any errors, click Finish > File by Internet. As long as you've registered with the Inland Revenue (online.inlandrevenue.gov.uk), Taxcalc can now log onto its site, submitting your return in just a few seconds.

Upgrade offer >> Taxcalc 2004

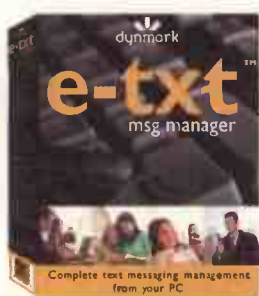
New features

- >> Capital gains pages
- >> Self-employment pages
- >> File a paper return

Is your income more than £20,000? Do you need to complete more return pages than just employment, like capital gains or self-employment? Would you like to file a paper return? Then you'll need to upgrade.

There are several options available, depending on factors such as the number of returns you'd like to submit. Prices start at £24.95 plus £4.99 postage and packing, and you can order from within Taxcalc Lite 2004 (Help > Upgrade) or at the website (www.taxcalc.com).





E-txt 2

FULL PROGRAM

Use your PC to send & receive text messages the easy way

Need to know

System requirements

Windows 2000/XP, 64MB Ram, 6MB disk space, Internet connection, mobile phone

Information

www.dynmark.com

Installation instructions

Enter your mobile phone number including the international dialling code (44 for UK) at dmp.dynmark.com/vnupromo/Register.htm. Go to www.dynmark.com and follow the instructions

Limitations

30 SMS credits included

Do you lose track of how many text messages you send in a day? Are your thumbs strangely painful sometimes? Is your phone bill ludicrously expensive? Then you're probably a text addict, but don't worry, help is at hand.

Install E-txt and it lets you send and receive text messages via your PC. The program works much like an email client, so you'll start off by creating a list of contacts. These can be saved individually, or you can sort them into groups, making it easier to send a text message to just your family members, for example.

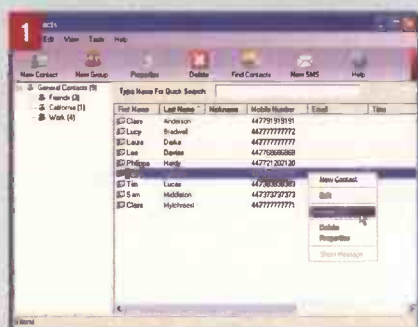
Sending messages is equally straightforward. Click New SMS, choose whether you want a response to your mobile or PC, and pick a recipient from the Contacts list. Type the text you want to

send and decide whether this will be a normal message, or flash text, which appears immediately on the recipient's screen.

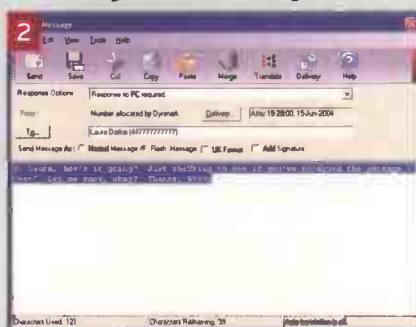
This approach is especially useful if you'd like to use SMS messages for marketing, or to quickly pass information to a group of people (employees, club members, family members and so on). To support that, E-txt lets you build generic message templates, which can be personalised for the recipient with merge fields (Hi {First Name}).

E-txt comes in just as handy when receiving texts. Build some message rules and you can tell the program to check the incoming message for its sender, or specific key words. Then E-txt can automatically reply to the message, move it to a particular folder or forward it to an email address or mobile number.

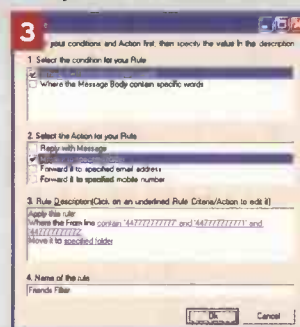
Send and receive text messages from your desktop



1 Click Contacts on the toolbar to create your address book. Select File > Import to read in details you've got stored in a csv file, or use New Contact to add names and numbers manually. Select New Group to separate your contacts into related folders (family, work, friends).



2 Click New SMS to send a text. If you'd like a response, choose whether it should be to your PC or mobile, from the 'Response options' list. Click Delivery if you'd like to schedule your text to be sent later, then choose a recipient for the message. Type your text and click Send.



3 Keep your incoming texts organised by creating folders for groups of contacts (File > New > Folder), then building rules to file messages (Tools > Message Rules > New). For instance, you could move texts from your Friends contact group to the Friends folder.

Upgrade offer >> Buy more message credits

Message credits prices

- >> 7.05p each for 200 credits
- >> 5.2875p each for 5,000 credits

E-txt comes with 30 message credits, so you can try it for free. If you like the program, then just buy more credits when you're running out. The price depends on the number you buy, so for 200 message credits you'll pay 7.05p each, but buy 5,000 and the cost drops to 5.2875p. Click Actions > Buy Message Credits Online to make your purchase or get the current price list from www.dynmark.com/dmp_messagecosttables.pdf.



FULL
PROGRAMON OUR
COVER DVD

Ashampoo Privacy Protector 1.04

Need to know

System requirements

Windows 98 or later, 5MB of free disk space

Information

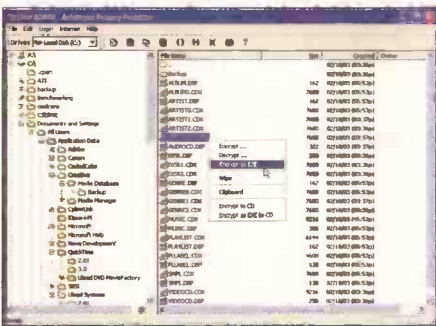
www.ashampoo.com

Installation instructions

Click Internet > Get Full Version Key in the Privacy Protector File Manager. Go to www.ashampoo.com and follow instructions

Limitations

None



Use Privacy Protector from Explorer, or from its own file manager

Your PC might have a firewall and anti-virus tool installed, but does that mean its data is really safe? What happens when you're emailing confidential information to a colleague? What do you do if your laptop is stolen, giving someone full access to all your files? Strong encryption is the only way to guarantee your data stays private, no matter what happens.

Ashampoo Privacy Protector integrates with Windows Explorer, so it's particularly easy to operate. To encrypt a file, select and right-click on it, then choose Privacy Protector > Encrypt. Use the Decrypt option to restore the original.

You could email a raw encrypted file to someone else, but they'd need a copy of Privacy Protector to use it. Choose 'Encrypt to exe' instead and Privacy Protector will build a self-extracting executable file. All your recipient needs to do is run it and enter the correct password to restore the original file. Other options allow you to quickly encrypt the contents of the clipboard, or encrypt a file and burn it to CD.

Feel free to experiment, but be sure not to forget the user name and password you create when installing Privacy Protector. There are no back doors, and if you forget them it won't be possible to recover your encrypted data.

Upgrade offer >> Winshampoo

As a registered user of Privacy Protector, you're entitled to a special upgrade deal on Ashampoo's Winshampoo tool. This includes a range of tools to uninstall applications completely (no remnants left behind) and detect and clean up all the junk files other programs have left on your PC. Normally \$59.98, you can upgrade for \$39.99 (around £22) at the Ashampoo store at www.ashampoo.com/shop/0021/upgrade.



Ashampoo Winoptimizer Suite

FULL
PROGRAM

Need to know

System requirements

Windows 98 or later, 20MB of free disk space

Information

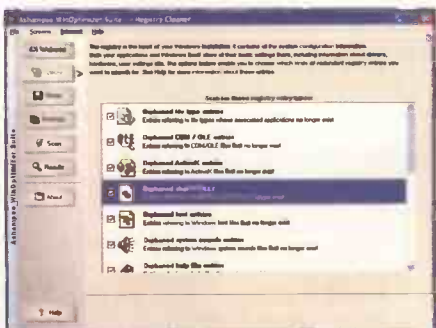
www.ashampoo.com

Installation instructions

Click Internet > Free Reg Key within the program

Limitations

None



Winoptimizer Suite offers plenty of ways to customise each of its modules

Does your PC appear to have slowed down recently? It may be weighed down with junk, 'temporary' files that have been created by your applications, but somehow avoided deletion. Launch the Drive Cleaner option in Winoptimizer Suite and it'll track down many of these files, making them easy to delete.

Registry bloat is another common problem. Lots of applications add entries to the Registry, but don't remove them if you uninstall the program later. Winoptimizer Suite has a Registry Cleaner that will find and erase any redundant entries.

Winoptimizer Suite also includes an Internet Tuner, designed to improve your

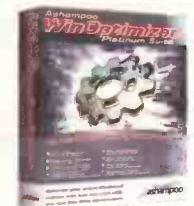
download performance by tweaking various TCP/IP properties. And there's a Startup Tuner if you need to take control of those resource-hogging programs that launch when your PC boots.

The Suite is rounded off with a couple of useful security tools. The Internet Cleaner stops others tracking what you're doing online by clearing away your cookies, Temporary Internet Files and other web traces. And the File Wiper deletes individual files and entire folders by overwriting them many times, so they can never be recovered. This is useful if you're selling your PC, say, but be careful – anything File Wiper deletes really is gone forever.

Upgrade offer >> Platinum Suite

The new version of Winoptimizer Suite adds new options and an attractive new interface. You also get new modules, such as the File Associator to easily tweak file associations, an IP Spam blocker to eliminate spam sent via the Windows Messenger service and a pop-up blocker. The regular price is \$49.99, but you can upgrade for \$19.99 (about £11) – visit

www.ashampoo.com/shop/0306/upgrade to place your order.





Maxivista SE 1.013

FULL PROGRAM

Need to know

System requirements

Primary PC: Windows 2000/XP, 3MB of disk space. Secondary PC: Windows 98 or later, 500KB of disk space. TCP/IP connection

Information

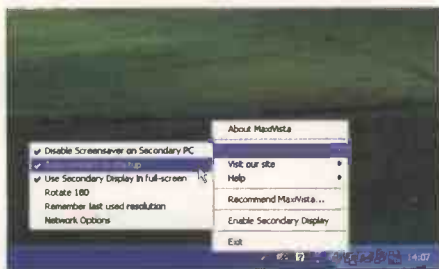
www.maxivista.com

Installation instructions

Go to www.maxivista.com and follow the instructions

Limitations

None



Right-click on the Maxivista system tray icon to access its configuration options

Why put up with a cramped Windows desktop? Add a second display to your PC and Windows will extend your workspace to cover both monitors. Now you can keep all the palettes and toolbars in your image editor on one display, perhaps, while you work in the other or have simultaneous full-screen access to an online tutorial, and your main application.

Maxivista makes all this possible for any Windows 2000 or XP PC, regardless of the video card you're using. All you need is a network connection to a nearby PC. Install and launch the Maxivista SE Server on your main PC, the Maxivista

Viewer on your neighbour and you're ready to go.

The server now fools Windows into thinking your main PC has an extra display. Windows then extends your desktop over the new screen, its content gets transmitted across your network and displayed by the viewer program. The second monitor resolution is limited to 640 x 480 on this version, but it's still useful (and the full program supports up to 3,200 x 1,600).

But what if someone wants to use the secondary PC? No problem, Maxivista doesn't get in the way. All they need do is press Escape to regain control over their own display.

Upgrade offer >> Maxivista

The latest version of Maxivista features improved performance and better memory handling and gives access to a full range of resolutions on the client PC. There are user interface improvements and support for a new resolution of 1,024 x 600 on the secondary display. Prices range from £28 for one licence to £15 if you're buying 100 or more. You can order at the Maxivista shop at www.maxivista.com.



Ace Backup 2003

FULL PROGRAM

Need to know

System requirements

Windows 98 or later, 2MB disk space

Information

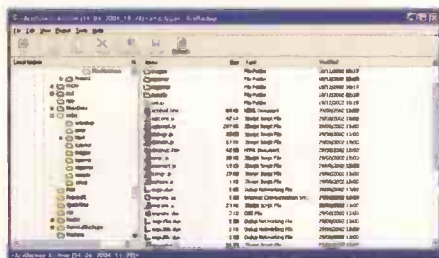
www.backup.com

Installation instructions

Launch program and click 'Activate'

Limitations

None



You decide what you want to do – save files individually or compress into one file

Backups don't have to be tedious, especially with a tool such as Ace Backup. To get started with the program, launch the New Project Wizard (File > New), and decide on the type of project you'd like to create. Choose the Backup project type if you're saving files individually, or Archive to compress them all into a single file.

The backup destination can be a local or network drive or even a remote FTP server. No FTP client is required, just enter your logon details into Ace Backup and it handles everything.

Sending your most valuable data over the Internet isn't exactly secure, of course. So

You can let Ace Backup encrypt it using the industry-standard algorithm of your choice (Rivest 128, 192 or 256bit, Blowfish 128bit, Triple-DES 128bit).

After completing the wizard, locate any files and folders you'd like to back up in the top two Explorer-type panes. Drag and drop them into the lower pane and they'll be added to the project.

Finally, save the project and click Process > Process all. Or you can use the Ace Backup scheduler to run it automatically, even when you're not around. Click Project > Properties > Advanced > Edit, and choose a schedule that suits your needs.

Upgrade offer >> Ace Backup 2004

Would you like to add files to an Ace Backup project directly from Explorer, or back up to CD or DVD? How about choosing different compression levels for your projects, or launching applications both before and after running an Ace Backup job? Then you might be interested in Ace Backup 2004, which has all these new features and more. Upgrading from version 2003 costs only \$9.95 (about £5.50) – read more at www.acebackup.com.



Next Month

on sale 19 August 2004

We check out 10 of
the most stylish
designer PCs around



Don't miss October's PCW...

Designer PCs

As more and more people decide they want to bring their PCs out of hiding and into the living room, style is becoming an increasingly important part of the buying decision. But what are your choices? We've cast our critical eye over 10 of the most stylish PCs. Are they just pretty faces or wolves in sheep's clothing?

Wireless media streaming devices

You can create and store so many types of multimedia on your PC these days, it's a shame not to be able to integrate this with your existing TV or hi-fi equipment. With so many devices on the market that can stream audio and video media wirelessly, it's easy to choose the wrong one. Read our round-up of these must-have appliances.

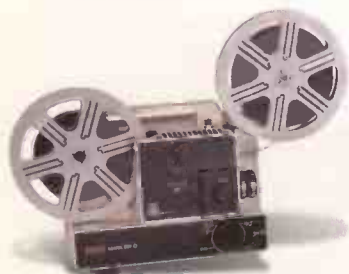
Converting VHS and Super8 to DVD

Why not give your old analogue VHS or Super8 films a new lease of life by digitising them and burning them to DVD? In our special feature, we'll walk you through the whole process from capturing the video, restoration and burning. And it doesn't have to cost a fortune – much of the software is low cost or even free, and if you've a relatively modern PC, you might not even need any extra hardware.

For regular updates of what's
in October's issue, go to
www.pcw.co.uk/PCW/next.jsp



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SEPTEMBER 1984

Sony is renowned for stylish machines and, while we'd snort at it today, this was still the case 20 years ago with its first home computer. Taking pride of place as our cover feature was an exclusive look at the HB-75. By today's standards it looked basic, but compared to rival machines then it was considered sleek.

Great design doesn't mean great performance, but with a 3.85MHz CPU and 64KB of memory, we thought it would tempt first-time buyers.

Otherwise it was business as usual for the magazine, with a range of software and micros on test, tutorials on programming, and accusations of lying flying around, with a vendor in the



The Sony HB-75 was considered stylish when it featured on our cover in 1984

news pages and *PCW* in the letters page both accused of being less than honest on certain issues.

Product of the month must be the VDU spectacles. Concerns about the damage computer work did to your vision prompted one company to launch the specs. Looking like the big sunglasses popular in the early 1980s, they would, the manufacturer assured, exclude ultra-violet and infra-red light. Judging by the number of people now wearing prescription glasses, they weren't a commercial success.

SEPTEMBER 1989

After complaining that the PC business was getting too serious for his liking, columnist Martin Banks was relishing the prospect of computing becoming fun again. With networks spreading beyond two or three terminals and even across platforms, he predicted computers would soon be associated with a more social environment. Little did he know the explosion of the Internet was only a few years away.

Meanwhile we were gearing ourselves up for the 1989 Personal Computer Show at Earl's Court, which promised to be one of the biggest so far. It couldn't do any worse than the recently staged Atari User Show. By all accounts, it was a truly dreary affair. The mood was set when Atari decided not to make an

appearance of any sort. With no new hardware of any significance on display, Atari's future

looked bleak. Possibly the most interesting and indeed telling outcome of the show was the petition organised by the Atari ST User Group, which demanded that Atari take the ST as seriously as its users did.

Finally, the Chipchat page took the latest version of Wordperfect to task. Early in the manual it calmly stated, 'Before installing Wordperfect on your hard disk you need to format the hard disk'. Well, that's one way of avoiding software conflicts.

SEPTEMBER 1994

In our September 1994 issue we finally got our hands on a beta copy of Chicago – the codename for Windows 3.1's long awaited successor. In a rush of excitement, this revolutionary (almost) 32bit operating system from Microsoft had been installed across our office PCs and, thanks to the fact that the beta was missing several networking components, brought the entire editorial server to a shuddering halt. Undeterred, we soon got a copy up and running and were duly impressed with the jazzy new interface. With features such as the brand new Start button, and the fact that hitting Ctrl+Alt+Delete didn't simply reboot your PC, we were impressed with what we saw.

However, at the end of the preview we questioned whether Microsoft would be able to live up to its promises and iron out all the bugs in time to ship the operating system by the end of the year. Our fears proved well founded, and it wasn't until August the following year that Microsoft finally got the product on the shelves. By this time, it had changed its name from Windows 4.0 to the rather more apt name of Windows 95.

Meanwhile, just round the corner from *PCW*'s offices, the UK's very first Internet café was being opened in London's Soho. The idea of being able to sip a cappuccino while taking a trip on the information superhighway had already caught on in San Francisco and Amsterdam, but the UK was yet to discover the pleasure of combining email and espresso.

SEPTEMBER 1999

Five years ago, we took one of the first ever looks at a 450MHz Power Mac G3. At the time, this was Apple's fastest ever system, featuring a processor with an enormous 1MB back-side cache. The rest of the machine was impressive, particularly the 16MB ATI Rage 128 graphics card and 9GB 7,200rpm SCSI hard disk. There were some omissions, such as the lack of a floppy drive, signalling Apple's preference for the Zip format.

Sticking with the performance theme, we also looked at the 600MHz Pentium III-based Panrix Fusion 600 PC. This provided a monstrous (at the time) 22GB hard drive and a 32MB Matrox Millennium graphics card that was the toast of the gaming world.

The *PCW* power trip continued with a preview of AMD's brand new K7 processor. This was the great-grandfather of all Athlon CPUs, which introduced a new instruction set that helped it perform (according to AMD) up to 40 per cent faster than an equivalently clocked Pentium III.

Flicking past advertisements that wouldn't look out of place in a 'top-shelf' magazine, our news section contained such delights as a hybrid organiser and videophone from Orange that used a high-speed circuit-switched data (HSCSD) service offering a theoretical data rate of 64Kbits/sec. The problem was, the device was so bulky you needed two hands to operate it.

To round things off, we looked at the differences between traditional CRT screens and flat-panel TFT monitors – a topic we revisit this month in our interactive Buyer's guide.

The *PCW* team

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"Packed full with features and no slouch in the performance department. Few people will find fault with the Geraldine..."

Nick Ross, Senior Labs Writer, PC Pro, August 2004

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- Intel Hardware PCI V92 56K Modem
- 16x DVD ROM
- 52x32x52 CDRW
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- Logitech Wireless Keyboard and Mouse
- Windows XP Home (XP CD supplied), Nero Burning Rom, DVD Software.



"JAL's team have craftily put together a first class system at a bargain basement price. It brings a new meaning to the term 'Best Buy'."

Ben Henley, Labs Writer, Computer Buyer, May 2004 Issue

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- GeForce FX 5600 128Mb Graphic Card
- Intel Hardware PCI V92 56K Modem
- 16 x DVD Rom - 32x52x32 CDRW
- 7 in 1 Card Reader
- Altec Lansing 221 2.1 Home Theatre Speakers
- Logitech Wireless Keyboard and Mouse
- VeiwSonic E70F+SB 17" Monitor
- Windows XP Home (XP CD supplied)
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Labs Writer, Computer Shopper - August 2004

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