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<sup>1</sup>Save £50 offer applies to Dimension & Inspiron Business systems only and is available 15th-28th May 2003 (except finance). Free Delivery offer on all Dimension & Inspiron Business systems available 29th May and 11th June 2003 (except finance). Subject to availability, prices and specifications are correct at date of publication and may change without notice. Delivery charge is £49 (£57.88 inc. VAT) per system. Dell's Terms and Conditions of Sales and Service apply and are available on request and at [www.dell.co.uk](http://www.dell.co.uk). Business customers only. <sup>2</sup>Microsoft Windows XP refers to Windows XP Home Edition. <sup>3</sup>Upgrade prices apply with system purchase only. <sup>4</sup>Response times may vary according to the remoteness or accessibility of product location. Service may be provided via telephone or Internet where appropriate. Certain restrictions apply. <sup>5</sup>Dell Installation service is only available for non-networked desktops/notebooks and where Internet services are provided. <sup>6</sup>Notebook batteries excluded – 1 year warranty only. <sup>7</sup>Includes a full version of ImageExpert's standard features, a 60 day trial version of ImageExpert's premium features and access to a 21-trial version of Paint Shop Pro. <sup>8</sup>Delivery Charge of £8 (£9.40 inc. VAT) if purchased without a system. Third party products are covered by third party manufacturers warranty. <sup>9</sup>v.i.s. refers to viewable in screen. <sup>10</sup>Free double memory and free double hard drive offer ends 30th May.

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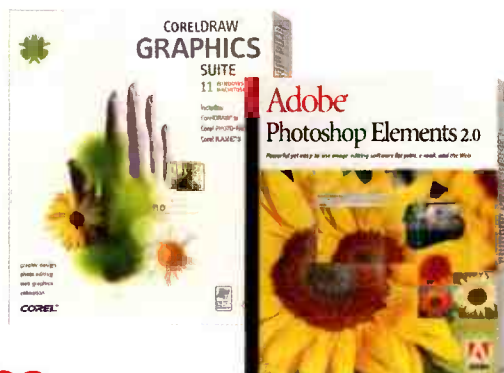
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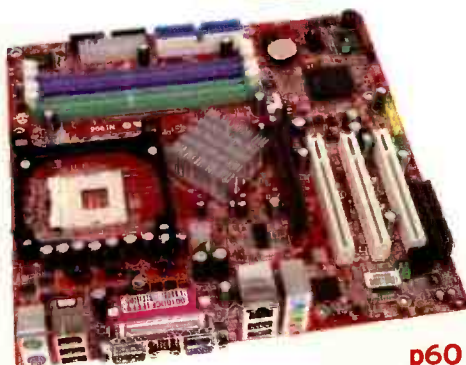
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Compact LCD with a USB interface  
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dylan\_armbrust@pcw.co.uk

# The future of communication

Dylan Armbrust wonders if Dab could be the answer to the ultimate all-in-one mobile device

I recently took an interesting call from a PR representative, doing what they call a 'media survey' on PDAs versus mobile phones. The survey I participated in asked if I felt PDAs would overtake mobile phones in the future as an all-purpose device. In other words, did I think mobile phones and PDAs could become one device that would appeal to the mass market?

It didn't take me long to ponder this question and reply – my instant response was an unequivocal yes. It's been a little dream of mine to have a nifty all-in-one mobile device that can really do what I want it to. I think it's only a matter of time before we see a merging of the two technologies into one, but will it be in a truly workable and useful fashion?

Naturally, we have already seen some hybrid forms of this occurring in the shape of Handspring's Treo 270 (reviewed May 2003) and Palm's Tungsten W (reviewed on page 76 of this issue), which include a mobile phone, email, web surfing and so on. But while these are useful, they haven't hit the mainstream, mainly due to price and service cost consideration, as well as a lack of a 'killer' (also known as useful and popular) application.

However, it's possible this may change sooner than we think. We already know from the overwhelming level of advertising that mobile phones can, aside from facilitating a two-way vocal conversation, also send text messages, photos and even play the odd game or two. But the truth is, aside from two-way conversations, the rest currently only holds a novelty value for early adopters. How many of us (and be honest now) really have a hankering to view low quality pics of our mates having a pint in the pub while we're at home nursing a cold or working late? And when it comes to PDAs, they are great organisers that can sync data with your PC beautifully, but are a bit bulky for most users to use as a phone. This is why the vast majority of us who make use of these technologies have both.

Now, however, a not-so-new technology has emerged that has the potential to change the way we interact with information on the move. This technology is Digital Audio Broadcasting (Dab) (see News, page 30). While the spectrum is limited in bandwidth, it still has a lot of space to manoeuvre, with room for more than just sending audio signals, and you can send data and video too. Of course, this is an obvious point when it comes to digital transmission, but it's not the interesting part, what's interesting is the receiver.

Could our PDAs become the receivers of video, data and audio streams that are continually refreshed, without the high usage costs of today's services? Absolutely. Could these devices also act as two-way communication devices? Without doubt. The potential is large and, instead of 3G technology and services, or Wifi hotspots winning the mobile computing game, it may be the unheralded Dab technology that delivers the killer applications of video, newspapers or music on demand to the masses.

It would literally be like having the ultimate TV in your hand: just select your channel and view the video, webpage, newspaper, data and so on that is being broadcast. Roll into the very same device a phone and video conferencing service and presto, you have the perfect mobile device. In fact, the possibilities go beyond that, but it would be a good start. Naturally, when it comes to integrating Dab into a futuristic all-in-one mobile device, I'm taking an optimistic view of it's potential. And like many ideas it may prove to be a dud, but it may be the best technology I can see to bring these two devices together.

**'Could our PDAs become the receivers of video, data and audio streams, without the high usage costs of today?'**



>> **Windows Server 2003**  
How does Microsoft's latest server offering perform? – see page 163



>> **Streaming**  
How to stream sound around your house – see page 199

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# Results explained

Explained below is a list of the benchmarks we use to test the products we review



Adobe Photoshop 6.01 is part of Sysmark 2002



3Dmark 2001 tests DirectX performance

### Sysmark 2002

Sysmark 2002 is an application-based benchmark made up of 14 applications. These are divided into two categories: office productivity and Internet content creation. A predefined script, with data, is run on each application at an execution speed that includes one-second pauses between operations to simulate human activity. Applications are also run concurrently to reflect the way most people use PCs today.

The time taken for each application to complete an operation is recorded. Sysmark calculates the geometric mean of the application times for each category, and converts these into a score for each category.

These scores are based on a comparison between the test system and a reference PC featuring a 1GHz Pentium III processor, an Intel 815EEA chipset motherboard, 256MB of PC133 SD-Ram, a 64MB Creative Geforce Annihilator 2 graphics card, a 30GB UltraDMA100 IBM hard disk and Windows XP. A score of 100 indicates that the test system has a performance equal to the reference PC, 200 indicates twice the performance and so on. An overall Sysmark score – the weighted geometric mean of the two category scores – is then calculated.

We run the benchmark at a resolution of 1,024 x 768 in 16bit colour. It is run three times, rebooting between each category. The applications are as follows:

### Office productivity

Microsoft Word 2002, Microsoft Excel 2002, Microsoft Powerpoint 2002, Microsoft Outlook 2002, Microsoft Access 2002, Netscape Communicator 6.0, Dragon

Naturallyspeaking Preferred v.5, Winzip 8.0 and McAfee Virus Scan 5.13.

### Internet content creation

Adobe Photoshop 6.01, Adobe Premiere 6.0, Microsoft Windows Media Encoder 7.1, Macromedia Dreamweaver 4, Macromedia Flash 5.

Sysmark 2002 is a commercial benchmark, available from Bapco at around £130 ([www.bapco.com](http://www.bapco.com)).

### 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

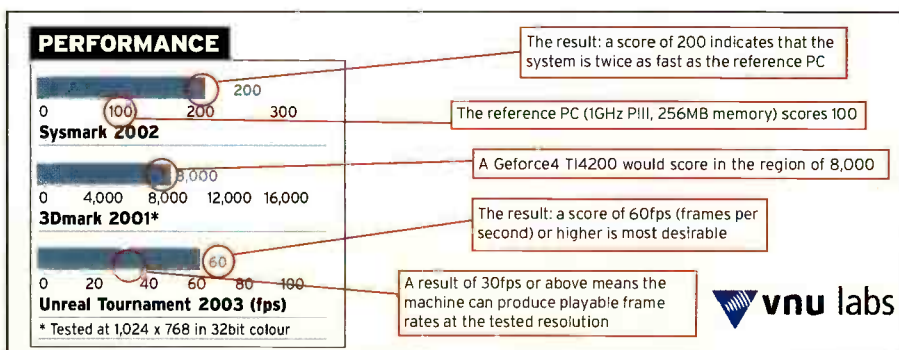
1,280 x 1,024, both in 32bit colour and textures, set to loop three times.

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.

The scores in the box below, provided as a reference, should give you an idea of how two different graphics chips perform under this test.

### 3Dmark 2003

Run at its default settings of 1,024 x 768 and 32bit colour depth, this update to 3Dmark 2001 will only fully run on DirectX 9 compliant cards. As there are currently precious few of these in the market, this will not be replacing 3Dmark 2001 as our standard graphics test. However, it will be tested on all capable devices and, where possible, scores will be quoted.

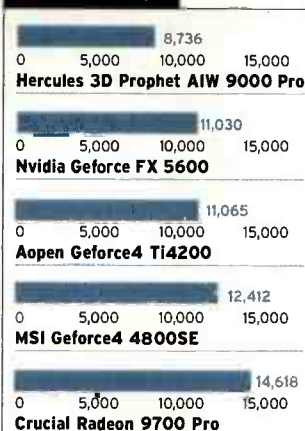






Unreal Tournament 2003 is used to test real world DirectX performance

## 3Dmark 2001



## 3Dmark 2003



A card's scores in 3Dmark 2001 differ greatly from those in 3Dmark 2003

3Dmark 2003 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 3Dmark 2003 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.

See the graphs above right to get an idea of how a card performs on 3Dmark 2001 against 3Dmark 2003.

## Unreal Tournament 2003

We also test graphics performance of PCs, graphics chips and motherboards with the Unreal Tournament 2003 benchmark. The benchmark is featured in the demo version of the game (available for download at [www.unrealtournament.com](http://www.unrealtournament.com)), but not in the full version. Once the demo is installed, the benchmark can be found in the System folder of the UT2003 Demo file.

The test is run with all the default settings and at 1,024 x 768 resolution. Once the benchmark has run, two results appear: a flyby and a botmatch result. We use the botmatch figure, as it is a better representation of frames that will be achieved when playing the game.

## 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 then recorded to disk every 30 seconds until the battery power finally diminishes.

## PCmark 2002

This test measures the performance of the hard disk subsystem. Both Read and Write operations are performed, cached and uncached. The tests access the disk in the

same way as normal applications and are not optimised to produce maximum throughput. However high throughput numbers will be produced due to the fact that no other tasks are running while the data is being transferred. Since Windows reserves a block of memory as the cache for file operations, the benchmark flushes the file buffer before each test to minimise the use of cached data in the tests. Before testing each drive is defragged, and then extensive read, write and copy tests are applied.

For more information on PCmark and 3Dmark, visit [www.futuremark.com](http://www.futuremark.com).

## Test beds

When testing graphics cards, motherboards, hard disks and optical drives, we use two test PCs. The first consists of a 2.8GHz Pentium 4, 512MB memory and a 120GB hard disk on an Intel 845PE chipset. The other features an Athlon 2700+ and an Asus A7V motherboard. All graphics and hard disk tests are 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.



3Dmark 2003 is so demanding it will only work on the latest cards



The Mother Nature test in 3Dmark 2003 will only run on DirectX 9 cards



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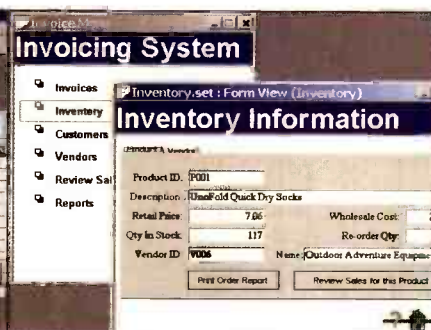
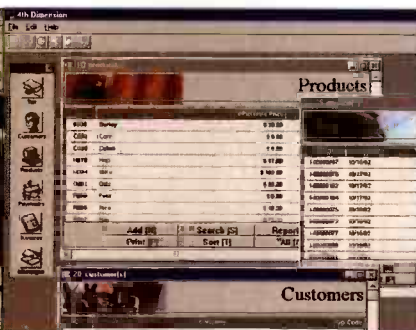
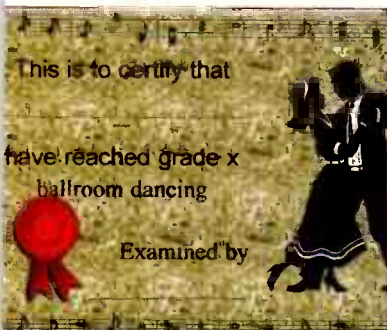
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## Full versions

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Turn to p292>

### 4D 6.7

This award-winning database development suite of tools is ideal for creating and deploying scalable and robust database applications on Windows and Mac. Applications built in 4D can be distributed in standalone and client-server environments as well as on the web. You can build just about any database solution imaginable, quickly and efficiently - from accounting to online catalogues and sales and marketing solutions.

Turn to p292>

### Alpha Five 4.5

Alpha Five is a relational database management system, designed to serve as a means for entering, processing and outputting information. Alpha Five provides a rich environment to create sophisticated databases, and design efficient methods for data entry and output. Some typical uses include inventory systems, customer invoicing and mailing lists.

Turn to p292>

## Free versions

### Powerdesk Express 5

Powerdesk provides a quick and simple way to organise and manage files, digital photos, mp3s and web images on your PC. You can customise your PC to move, copy, zip, label, colour code, search, view, prioritise, convert, and use your files the way you want.

### PC Magazine e-books

The three latest *PC Magazine* e-book editions, designed to give you a taste of our sister magazine in its new electronic incarnation. The new venture will make *PC Magazine* available to readers online. Also included are Adobe Acrobat Reader and Ebook Reader.

## On the DVD-Rom

### Money Matters

GSP's Money Matters (aka Money Organiser) takes the hard work out of managing your personal finances. By setting up your bank, credit card and savings accounts and then taking a few minutes each week to enter the details of any transactions, you can produce charts and reports showing the state of your finances, helping you to plan and budget accurately.

Turn to p294>

### Plus...

We've gathered together a selection of some of the best photo tools, and in our regular Essentials section you'll find more than 70 great utilities and add-ins. We've got scores of product group test reviews and workshops from past PCWs in Acrobat pdf format. Also included are some of the latest playable games demos - this month: Indiana Jones and the Emperor's Tomb, Devastation, Postal 2, Delta Force: Black Hawk Down and Bandits: Phoenix Rising.

## USING THE COVER DISC

The PCW cover disc uses a web browser-style interface, but you'll need to have Internet Explorer 5 or later to take full advantage (using the dedicated PCW browser option). If you use Netscape, Opera, or an older version of IE, you can still browse the disc using your own browser, and install programs by clicking the install buttons. However, you will be presented with the usual download/run dialogue box (see the support section in the disc menu). Note: 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 run pcw.exe 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 July 2003 cover disc  
ABT, 306 St Mary's Lane  
Upminster, Essex RM14 3HL  
quoting reference 'PCW Vol 26 No 7'.

**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 email us at pcw@vnusupport.co.uk.



## Contents

### News

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- 29 Track your mobile
- 36 Microsoft moves on mobiles

### Special report



PCs that double as music and DVD players, like this Xperian from Hi-Grade (see our review next issue), are the most obvious signs of the changes embracing mobile devices in particular, that will affect the way we communicate and get information or entertainment.

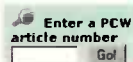
'The mobile is developing into a medium in its own right, the love child of broadcasting and the web'

See Computing's New Wave on pages 30-32

### Analysis

- 36 Will Microsoft's dominance extend to mobiles?

### PCW numbers



Throughout the News section you'll

see references in stories to PCW numbers. To find out more information on these stories, or to read a fuller version, just go to [www.pcw.co.uk](http://www.pcw.co.uk) and put the number in the box pictured here.

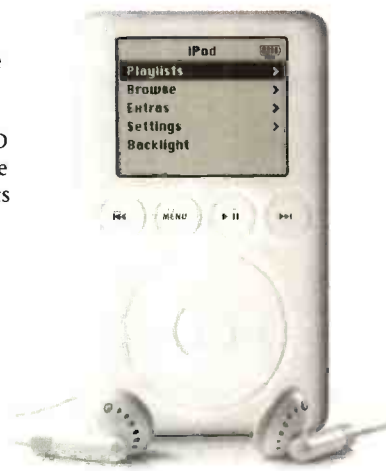
## The world is your jukebox

**T**he music industry is finally moving onto the web in a bid to counter file swapping, which is being blamed for a massive drop in CD sales. Record giant EMI is to make 140,000 tracks from 3,000 artists available for download. Apple has put 200,000 songs online for sale in the US at 99 cents each, with no restriction on how many copies are made.

Apple sold a million songs within a week, going some way towards confirming the view of many analysts that the best way to reduce digital piracy is to sell material online at a reasonable price.

The service is not yet available in Britain, though you could buy from the American site if you have a US billing address – at least until the new VAT laws kick in (see page 18)

The moves will be closely watched by the movie industry, which also faces the a major shift in the way it sells its products. A landmark court case involving 321 developers of DVD copying software, was



Apple has launched 10GB, 15GB and 30GB models of its iPod music player costing £249, £299 and £399

delayed as we went to press. But, as we show in this month's special report (Computing's New Wave, pages 30-32), the technology is already moving on to the point that the online world is turning into a sort of multimedia jukebox, with all types of content on tap. This is because the availability of

low-cost, high-capacity storage, combined with fast web links and multimedia broadcasting, is providing new ways to deliver music, movies and other digital material.

Apple's iPod, which allows you to carry 7,500 tracks in your pocket, is typical of a new class of device that is driving the changes. Its iTunes software links with Apple's music store, where users can buy tracks from major companies including EMI, BMG, and Sony. Artists include Bob Dylan, U2, Eminem, Sheryl Crow and Sting.

EMI will charge between 80p and £1 for tracks from the likes of Kylie Minogue, David Bowie, Robbie Williams and Pink Floyd. However the Beatles aren't available yet, as their agents haven't agreed to terms.

You will be allowed to burn the tracks onto CDs, or load them onto music players. Songs will be available online at the same time they are released to radio stations, before they are released to the shops.

## Mains brings 1Mbit to ADSL shadows

Data-over-the-mains has made a comeback in Britain to offer a new broadband option for people outside the catchment areas of cable and ADSL – and competition for both elsewhere.

Southern Electric charges £30 a month for a pilot symmetrical 1Mbit/sec link in Winchester – better than ADSL or cable, which offer just 250Kbits/sec upstream. Similar pilots are being run by its parent, the Scottish and Southern Energy Group, in Crieff, Campbeltown and Stonehaven in Scotland.

Nortel and Norweb trialled a similar scheme in Manchester but stopped it in 2001, claiming a lack of demand and 'a few remaining technical problems'. The technology is similar to

ADSL, in that a high-frequency signal shares the same line as a low-frequency stream – 50cycles per second in the case of the AC mains, voice audio in that of ADSL. Just as phone exchanges need to be ADSL-enabled, so do electricity substations, which vary enormously in size.

A spokeswoman for Southern Electric could not say how much this costs, but said that there was scope for delivery to small, relatively remote communities. The Scottish trials were sponsored by the local development agency for just this reason.

BT's latest 'midband' offering, also aimed at people in the broadband 'shadowlands', looks miserly by comparison. It is basically a repackaging of the

old Home Highway service, which provided one 64K ISDN line and standard line for £25 a month plus £9.25 line rental.

The new BT Midband service costs £35 all in, and switches automatically between 64K and 128K depending on whether the voice line is being used. Included is 150 hours of 64K surfing, within which 128K access counts as double time.

Existing Home Highway users can upgrade for free; otherwise there's a £74.99 installation fee.

● Internet service provider, Breathe, has breathed its last. Users were told their service would be cut off on 24 April due to 'Affinity Internet (Virtual ISP Services Ltd) being placed in administration'.



>> **AMD's new 64bit Opteron**  
Just how good is AMD's 'Pentium killer'? - see pages 26 and 54 for a full review

>> **Avoid net spams and scams**  
Advice to help you regain control of your inbox - see page 96



# Now computers read lips

Intel has released software on an open-source licence to enable computers to lip-read as a way of improving speech recognition, which some researchers believe has gone about as far as it can go.

It has got better over the past five years, thanks to processors that can perform multiple fast statistical operations. Mark Erwich, international marketing director at Dragon Naturally Speaking vendor Scansoft said: 'We couldn't have sold our current software five years ago because the processors were not up to it.'

But you still need to take a lot of care to use speech recognition successfully, as accuracy is badly affected by background noise and mic position. Future computers are expected to use 'multi-modal input', exploiting a combination of methods such as speech, body language and pen to deduce meaning. Rather as we do ourselves, in fact.

Intel senior fellow Justin Rattner said: 'Recognising other humans is seldom based on a single type of information. We



This little robot, called Aprialpha developed by Toshiba, is said to be able to recognise people and hold conversations with them. It can also communicate with home appliances and perform security patrols. There is no word of it being able to do anything really useful, such as sweeping, washing up and scrubbing your back in the bath, but don't despair: its Open Robot Controller Architecture can be programmed to perform new tasks.

make decisions by combining information from a number of sources.' Audio-Visual Speech Recognition (AVSR) lip-reading algorithms in Intel's OpenCV library can lip-read surprisingly accurately - up to 50 per cent - by themselves. But they require enormous computing power, which is obviously why Intel is interested in them.

Future processors are likely to have sections hardwired to optimise processing of this type

of information. The processor will also have to weigh what might be quite contradictory information from different inputs - when you shout 'No' after accidentally tapping a Delete button, for instance.

Other moves to improve recognition are less demanding. They include the use of more than one mic to help separate speech from noise. **Clive Akass**  
● Computing's new wave - see pages 30 to 32.



## Design your own dream partner...

Desperate to find the love of your life? Do people you meet never live up to your dreams? Well fret no more, as you can design your ideal partner at [www.speeddater.co.uk/flash/index.cfm](http://www.speeddater.co.uk/flash/index.cfm).

Your design won't be made flesh but you can get to try the new craze of speed dating. Fifty or 60 men and women meet in a bar and are rotated so that each man spends exactly three minutes with each woman. Pairs who register mutual interest are put in touch. You may recognise one name among the organisers - former PCW Editor Ben Tisdall.

## ... or sell yourself

Essex man Tom Couchman advertised a date with himself on Ebay - and got a £10.50 bid before the site pulled the ad.

**PCW Number 1140146**

## Workaholic notebooks justify PC ageism

Corporate PCs are ageing to the extent that 50 per cent are getting to be at least three years old. The news is unlikely to elicit much sympathy in schools, local councils and other public bodies where you can find many antiques still in service (and we are not talking about the people).

But the trend is being closely watched by Intel, which says that up to the year 2000 companies were replacing a third of their PCs every three years, leaving virtually no old ones in service. Now the replacement rate has halved.

Intel has consistently pooh-poohed the common view that upgrades are not the imperative that they were because hardware no longer lags behind the needs of mainstream software. Intel blames the economic downturn but it is worried enough to enumerate the disadvantages of hanging on to old machines.

Jeff McCrae, vice president of corporate client demand at Intel, pointed out that support for Windows 9x and NT will end at the beginning of next year, after which users will get no driver updates, and security patches will tail off (check out this article on our website for a link to details). Even where you have patches there is 'the problem of deploying them in an environment with a complex mix of software versions.'

XP is more secure than older operating systems and trying to install it on old machines can cause more problems than it solves, McCrae said.

He also argued that Wifi-enabled notebooks, which are commonly being used to replace desktops, increase efficiency. He cited figures purporting to show that companies got up to eight hours more work per week from staff who use them. So if the boss buys you a flash new notebook, you know what's expected of you.



Of course I'm working in here. I've got to get a day's extra work a week out of this thing!





### >> Canon shot

Canon claims this MV6iMC digital video camera is its smallest yet. Packing a 10x optical zoom, an SD card slot, and an 800,000-pixel CCD, it doesn't ship til June. Prices were not available.

### >> PC giveaway

Microsoft has agreed to give \$202m worth of vouchers for computer equipment to people who bought its products in Florida in the seven years up to 31 December 2002. One in two of any unclaimed will go to needy schools as part of a deal to settle a class action alleging Microsoft violated Florida's competition laws.

PCW Number 1140247

### >> Price cut

The price of Steinberg's new Halion VST version 2 sampler has been cut by 11 per cent to £277. New features include filters from synthesizer specialist Waldorf and 5.1 surround functionality.



### >> Thin vision

Anders has launched a range of stylish TFT monitors ranging from standard 14in to 30in widescreen, capable of taking input from a variety of sources, including videocams.

[www.anders.co.uk](http://www.anders.co.uk)

### >> Email on tap

Vtec USB drives now pack a free utility that checks and downloads your email from any PC. [www.vtec.co.uk](http://www.vtec.co.uk)

# Server hiccups into 64bits

**T**he launch of Microsoft's Windows Server 2003 proved the truth of Murphy's Law, Rider 234, which states if anything can go wrong it will happen, when press and TV cameras are watching.

Industry heavyweights were in London to hail what Microsoft says is its most secure and robust server software to date. Six editions are available immediately: web, standard, datacentre and enterprise, the latter two in both 32bit and 64bit versions. A seventh, called the small-business edition, will be available later this summer.

Microsoft set up servers on stage at the launch event to illustrate how easy it was to switch a database from a 32bit to the 64bit operating system, which can address virtually limitless amounts of memory. First, a search was performed on the 32bit version, and a record marked for identification, then the database was plugged in to the 64bit version.

There followed coughs and muttered imprecations; configurations were double checked; plugs were pulled out and pushed back; after a couple of minutes, to the relief

of all on and off stage, the 64bit code kicked in and the search for the marked record was repeated – noticeably slower than with the 32bit version.

Analysts agree, however, that the new software is a significant advance on NT4 and Windows 2000. You can read our feature on Windows 2003 on page 163.

Also launched was a 64bit version of SQL Server 2000 and Visual Studio .Net 2003, a tool set for developers to build web services (see Microsoft moves on mobiles, page 36).

# Hiptop looks tiptop for summer launch

The Hiptop Communicator, which looks like a cross between a PDA and a small games machine, is scheduled to launch in Britain this summer, with a

colour screen – and it could shake up the PDA market.

The US version caused a mini sensation when it launched for just \$199 (£125) – and chief executive Hank Nothhaft, of developer Danger, says that with some of the technology taken in-house that price is likely to be cut by 50 per cent within a short period.

The UK price for the colour machine is expected to be around £200 but that may be discounted if, as expected, it is sold through operators like T-Mobile and Orange.

The Hiptop supports Java apps, always-on

email, and web browsing via a Danger-operated sever that reformats content for the screen.

The screen swivels round to reveal a little keyboard that can be operated by your thumbs. It allows you to view, but not edit, Word and Excel email attachments.

One drawback is that it has no expansion slot, though it can use a custom-built camera. But Nothhaft said a slightly thicker version is being prepared that would have more room for a slot.

The shape will appeal to young people, if a research by NTL Broadcast is anything to go by. It voted PDAs in the shape of games machines as most appealing, according to director of product development Simon Mason.

[www.danger.com](http://www.danger.com)



The Hiptop looks like a tiny games machine

# VAT's the problem? It's a new Euro-rule on etrade

If you plan to buy software from small sites outside Europe you had better do it quickly, as after July 1 you could be breaking the law.

A new directive comes into force obliging any business outside the EU to register for collection and payment of VAT on digital material sold to anyone in Europe. Currently 'supplies of

downloaded software to private consumers from suppliers outside the EU are generally VAT free,' says Customs and Excise.

But from 1 July VAT will be due, a spokeswoman said. Major non-European suppliers have already agreed to co-operate, but the authorities seem hazy about how they will enforce the directive with smaller vendors. One plan is

to encourage them by facilitating compliance. 'A special electronic registration and VAT accounting scheme will be available to non-EU suppliers with electronic means of registration and submitting returns.'

And if companies still ignore the law? 'Customs & Excise will be monitoring the situation carefully,' the spokeswoman said.



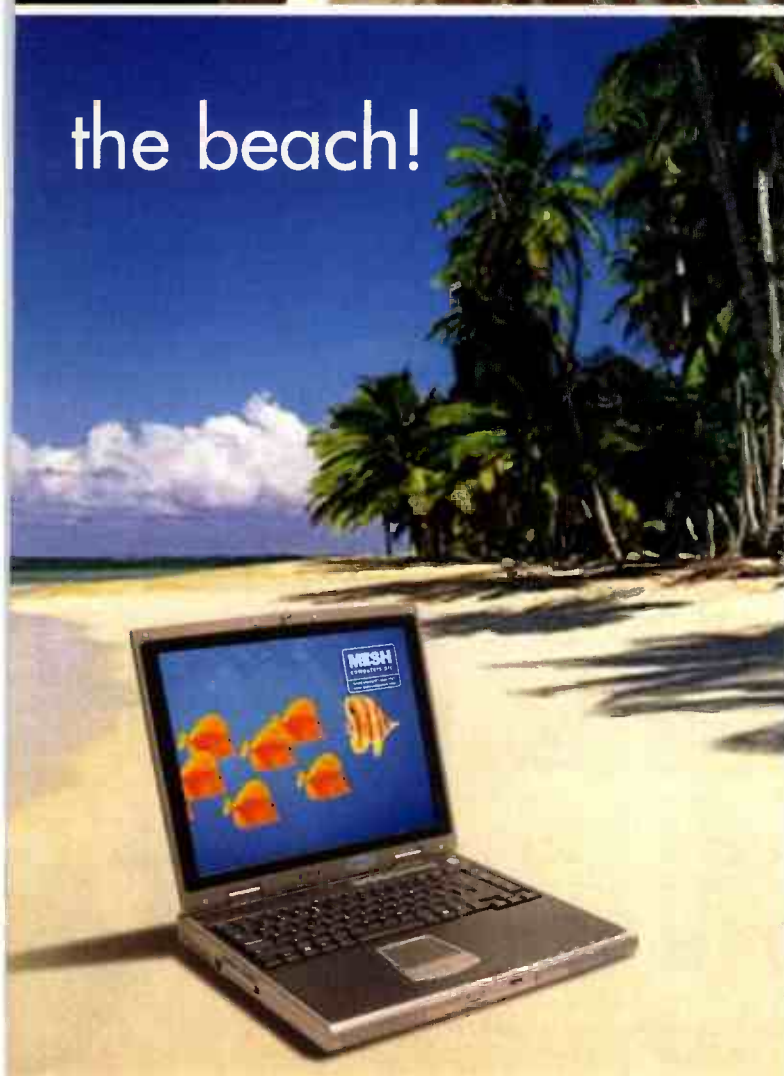
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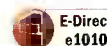
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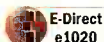
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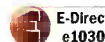
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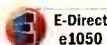
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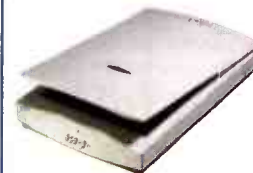
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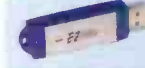



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## Intel stokes up the opposition

Intel is rumoured to have a dual-mode 32bit/64bit Pentium ready in case the AMD64 architecture takes off in the market, where it could present as much of a challenge to high-end Pentiums as to the 64bit Itanium.

Shortly before the Opteron launch, Intel shipped a new 3GHz Pentium 4 (reviewed *PCW* June) with what it boasted was the most significant platform update for years. The front-side bus is a little more than 50 per cent faster at 800MHz, and the Canterwood 875P chipset supports 400MHz double-data rate Ram. The 875P uses the Communication Streaming Architecture (CSA) bus dedicated to Ethernet links of up to 1Gigabits.

Intel also introduced a new P4 M mobile processor clocking 2.5GHz and two mobile Celerons clocking 2.2GHz and 1.26GHz.

## Toshiba unveils 64bit processor

Toshiba has launched a 64bit Risc chip for connected devices of a type dominated by Arm architecture like that underlying Intel's Xscale processor.

The new TX49/H3 uses 0.13micron Cmos technology, runs at a maximum 300MHz, and comes with either a built-in Ethernet Media Access Control or a Nand Flash Memory interface.

Rival Arm designs are predominantly 32bit, which the company says is sufficient for the devices that use it.

Motorola has optimised a version of its ARM-based next-generation i.MX processor for the latest version 4.2 of Windows CE.Net. The Arm-based i.MX is designed for next-generation PDAs, smartphones and personal digital entertainment devices.

## Suse support

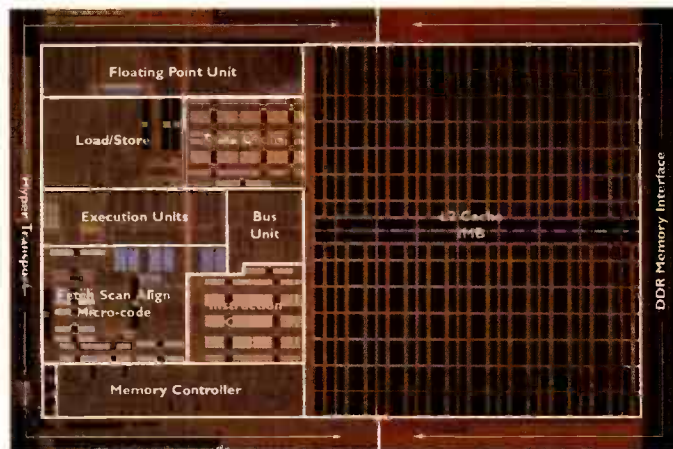
Suse has compiled a version of Linux for the Opteron. Enterprise Server 8 for AMD64 is shipping now, with the company claiming rival Opteron Linux distributions won't be ready until autumn.

# 64bit Opteron challenge

**A**MD launched its long-awaited 64bit Opteron processor on schedule last month in a bid to capture some of the lucrative market for workstations and high-end servers. A consumer version, called the Athlon 64, is due to launch later this year.

Opteron's selling point is that it runs both 32bit and 64bit software natively, offering companies an easy upgrade path and allowing high-end graphics workstations, for instance, to run 32bit office apps. These actually run slower on Intel's 64bit Itanium than they do on its high-end 32bit Xeon processor.

One big question mark over Opteron was removed at launch when Microsoft committed to produce a 64bit beta of its Windows Server 2003 for the processor this summer, ready for a full release later this year. The



Opteron unveiled ... more than half the space is taken up by 1MB of L2 cache.

operating system is already available for Itanium, but that uses a very different instruction set. Opteron, ironically, sticks to Intel's classic x86 instructions, or rather a version called AMD64 (aka x86-64) amended to cope with the extended architecture.

Opteron is manufactured using a 0.13micron SOI (silicon on insulator) process and packs 105.9 million transistors. It has 940 pins and looks similar to a Pentium 4 with its metal heat spreader covering the core. Level 2 cache is a hefty 1MB.

One obvious difference with previous generations is that it integrates a 128bit memory controller into the processor, so that Opteron does not have a front-side bus as such, but simply runs at its given speed.

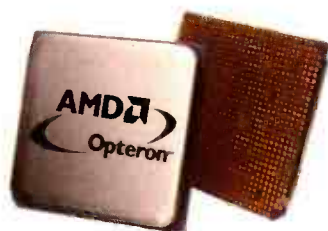
The controller supports DDR SD-Ram up to PC2700 and the wide address space means there

is no effective limit to how much memory it can point to directly. Tyan's Thunder K8 motherboard, for instance, has six slots and supports up to 12GB of Ram.

AMD's 8100 chipset series for the Opteron does not support AGP graphics, making it more suitable for servers than workstations. At launch the only partner with an AGP chipset was Nvidia with the Nforce3 Pro. However, VIA has since announced the K8T400M, which also supports AGP 8x.

AMD's spin on the Opteron was summarised by its chairman Jerry Sanders: 'Best in class 32bit performance today; 64bit when you're ready'. Right now we only have Sanders' word for it, but there is no doubt that Opteron is a hugely significant launch (see Armari Opteron review on page 54).

Leo Waldoock



The first Opterons run at 1.4GHz, 1.6GHz and 1.8GHz and are called respectively the 240, 242 and 244. The first digit of each model number refers to the configuration (1 for one processor up to 8) and the second two designate speed - though, as these first names show, not so simple as to make it obvious.

## Fiorina fuels rumours of double-dealing by HP

A sighting of HP chief executive Carly Fiorina gave gossips a field day at the Opteron launch. Of all the big vendors only Fujitsu-Siemens had committed to producing an Opteron graphics workstation, and IBM announced support only after the launch. Everyone knew AMD needed to line up some major partners.

So not a few eyebrows were raised when Fiorina strolled through the bar of New York's W Hotel, where journalists and AMD top brass, including chief executive Hector Ruiz and company founder Jerry Sanders,



Fiorina: paths crossed with AMD, but no double-crossing

were staying. Your intrepid reporter promptly headed in the opposite direction to see where Fiorina had come from, and found a door marked 'HP CIO Congress'.

HP co-developed the 64bit Itanium processor with Intel, so it was clearly just a coincidence that the meeting came at a time AMD high-ups were around. Itanium sales are rumoured to have been less than staggering, but HP wouldn't turn its back on Intel to cosy up to AMD about the promising-looking 64bit Opteron, would it?

Leo Waldoock

# Virus hits security show

**T**he danger of rogue code was highlighted at a big security show in London when the event's own network was hit by a Trojan called Deloader, which installs 'back door' code allowing hackers into a machine.

Exhibitors at Infosecurity Europe were notified of the infection and advised on how to remove it. But Etienne Greeff, professional services director at MIS Corporate Defence Solutions, said his company had installed its own separate network to avoid the problem.

'With this many security professionals gathered together, all with the latest hardware and software, a virus was not

going to be unexpected. It's a common problem in hotels and airports too,' he said.

The show was one of the best attended in years, with companies from 55 countries present. Delegates were warned of 'incontrovertible evidence' that organised crime is moving in on e-trade, and that business would be increasingly hit.

Det-Supt Len Hynds, head of the National High Tech Crime Unit (NHTCU), said: 'High-tech crime is an oxymoron, a classic contradiction in terms. It's not about technology, it's about people. If you're a victim of fraud it hurts every bit as much as in the real world.' Three out of four companies

surveyed for the NHTCU had suffered some form of cyber crime, according to results released at the show. Sabotage or financial fraud is committed mostly by staff, but information theft is almost equally likely to be an outside or inside job.

Also at the show was Microsoft's head of security, Craig Fiebig, who spoke of the problems of providing reliable, easy-to-install software patches. He said there is a reluctance among system administrators to incur network downtime by installing patches.

'It's the hardest one to solve,' Fiebig said. 'In dollar terms, patching is the most expensive security measure, and keeping your antivirus descriptions up to date is the least. If customers could do both it would eliminate the bulk of security problems.'

● Firms are being lax about keeping out-of-office staff virus free, according to a survey by anti-virus specialist Sophos.

Two out of three companies diligently update their office-based anti-virus software daily, but seven in 10 check remote staff only once a week.

Iain Thomson

## Rogue code calls costly sex lines

Klez topped the virus 'hit parade' for the 15th month in a row in April, security firm Sophos said. Making the chart for the first time was Datemake, which is programmed to call a premium rate 'adult' line. Chris Belthoff, senior product marketing manager, warned companies to apply strict guidelines to avoid a 'huge telephone bill, not to mention the potential embarrassment brought by these seedy programs.' Hoax emails are also causing problems. One called WTC Survivor, warning of an imminent attack, was picked up by a Gulf newspaper, which warned readers of the alleged threat.

## Step on the Juice for mobile power

Mobility Electronics has produced another way to curb the proliferation of power adapters that are foisted on computer users on the move.

The Juice power adapter from Igo (<http://igo.ententeweb.com>) is not quite the smart supply long advocated by PCW, but it does allow you to use the same adapter for your laptop, palmtop and mobile phone.

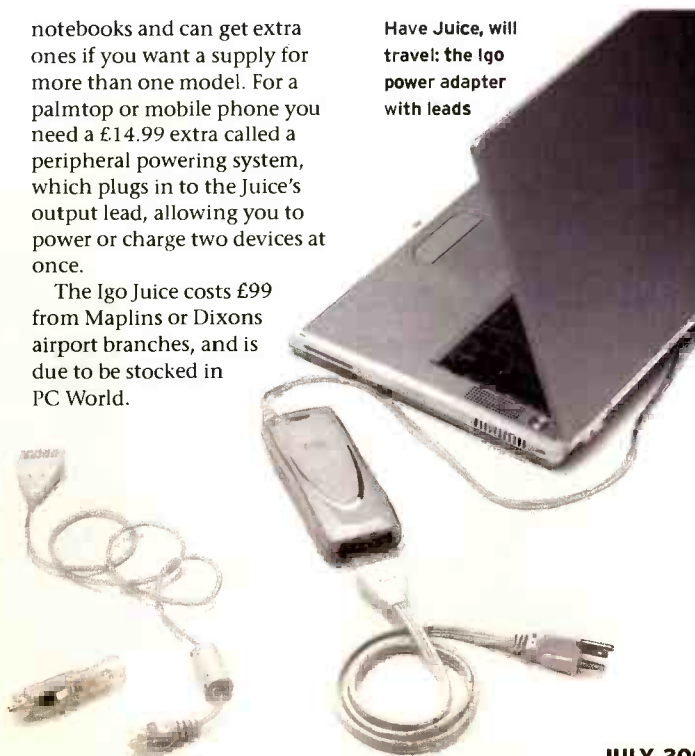
The adapter takes power from either a car lighter socket, an aircraft power socket or the mains of any country.

Juice looks a little like an electric shaver and comes with a black travel bag plus a choice of leads for the three types of power source. The one we looked at had only a UK power plug, so you'd need a passive adapter for sockets abroad. You get a choice of tips to fit leading makes of

notebooks and can get extra ones if you want a supply for more than one model. For a palmtop or mobile phone you need a £14.99 extra called a peripheral powering system, which plugs in to the Juice's output lead, allowing you to power or charge two devices at once.

The Igo Juice costs £99 from Maplins or Dixons airport branches, and is due to be stocked in PC World.

Have Juice, will travel: the Igo power adapter with leads



### >> Martial claw

Terratec's Mystify Claw mouse £49.99 (inc VAT) is said to be ergonomically sound for gamers and has 10 programmable buttons. For £10 extra you can get the Mystify Razor Boomslang 2500 with a resolution of 2,500dpi.

### >> Domain warning

Companies using top-level domains, such as .com or .org, risk losing them if they don't keep contact details up to date, says regulator Iann. A new rule says they must update their records on Iann's WHOIS database annually.

PCW Number 1140432

### >> MMS link-up

Mobile phone users can at last swap pictures between any network following an agreement between operators. More than a million MMS phones have already been sold, but operators have been disappointed at the number of people using their facilities for sending pictures.

PCW Number 1140197

### >> 18in flat panel

Transtec has launched an 18in TFT monitor for £345.45 (£294 ex VAT), complete with integrated speakers. It has a resolution of 1,280 x 1,024 pixels at a maximum refresh rate of 75Hz.

[www.transtec.co.uk](http://www.transtec.co.uk)

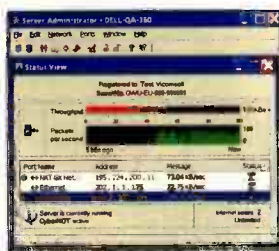
### >> PDA slump

Global PDA shipments were down 11.1 per cent in the first three months of 2003, says analyst Gartner. Palm's PDAs still lead with 32.8 per cent, but 52 per cent of those models sold are Microsoft-based.

### >> Business offer

For the first time, PC World is now offering on-the-spot rental deals for businesses.





### >> Easy gateway

Vicomsoft has launched a new version 8.5 of InterGate, its e-security and connection sharing application. New features of the product, formerly called Internet Gateway, include an easy-to-use configuration manager.

[www.vicomsoft.com](http://www.vicomsoft.com)

### >> Fitness trainer

Personal Trainer One 3.2 is designed for people wanting to get fit through a healthy balance of nutrition and exercise. It estimates your daily energy intake and spending, and tells you how much exercise you need to do to burn excess calories. It costs \$19.95 (£12.60) from <http://getpto.net>.

### >> Just the ticket

Elk River has released a new version 5.3 of a product range designed to print tickets, labels and complex forms. The basic Ticketbench Plus costs \$39 (£24.70); Ticketbench Pro, which supports a variety of numbering sequences, costs \$150 (£95) and Venuebench, with data import and bar-code formats, costs \$350 (£222) [www.elkriversystems.com](http://www.elkriversystems.com).

### >> Cameo role

Terratec has cut the price of its Cameo 600 DV video-editing card by 30 per cent to £69.99 (inc VAT). The package includes a Firewire card with cable, plus Ulead's Mediastudio 6 VE and Cool-3D software, with Adorage Magic effects. Call 0118 982 1612 for more information.

### >> New browser

Opera has released a beta version 7.10 of its browser for both Linux and Windows. New features include Fast forward and Rewind buttons, photo slideshow, cookie and password managers and a mail client. [www.opera.com](http://www.opera.com)

# How to spy on your kids

**S**pyware developers have taken to boasting about how intrusive their programs are, in full knowledge that there are enough control freaks around to keep them in business.

Spectorsoft has released a new version 3 of its Eblaster spy software. This will record a PC's every keystroke, plus incoming and outgoing emails, passwords, instant messages, chat and websites visited – and send it all to a specified email address.

You can thus get instant reports on everything your wife, husband or child gets up to

online. You can also monitor staff use of the Internet.

Spectorsoft president Douglas Fowler provides an example of how a parent might use Eblaster 3: 'Your child gets home from school. She receives an email after signing onto the Internet. Within seconds, you receive an exact copy of that email at your work computer, showing you who sent the email and the exact content of the message. She replies to the email and within seconds, you receive an exact copy of that email, too.'

'This lets you determine instantly whether the person

communicating with your child is truly a good person.'

Fowler warns: 'Child molesters are notorious for gaining the trust of a child over a long period of time by exhibiting interest in their daily lives. Once they've gained your child's trust, they come in for the kill.'

He does not say if Eblaster has facilities to help prying parents make peace with their children. But for those who don't care, or who have serious reason to believe their child is at risk, it costs \$99.95 (£64) from [www.eblaster.com](http://www.eblaster.com).

# Rent-an-app challenge for trialware

Free evaluation downloads of many products could be under threat by a system that allows software to be used on a subscription or short-term rental basis.

German ebusiness developer Element 5 says it could also allow you to hire major products like Adobe Photoshop for a few days to complete a project – though the company has yet to get the necessary licensing deals in place.

It is currently being used for products like firewalls that suit the subscription model because they need regular updates. But it could also appeal to small software houses selling utilities that perform a narrow range of tasks. These companies often have little option but to resort to trialware or shareware to gain



Element 5's Shumann: a new usage oriented model for selling software

a market. But they can lose out on revenues from people who may only want to use a product once for a particular job.

Using Element 5's system they could charge a small amount for

short-term use which could be deducted from the cost of a full licence if the user decides to purchase one. Chief executive Gerit Shumann said: 'Ours is a usage oriented model.'

It is only superficially similar to that of Application Service Providers (ASPs), because the software is run on the user's system rather than a remote server. ASPs were in vogue a couple of years back – largely, one suspects, because of wishful thinking by software vendors which saw them as a way of deriving long-term revenues from products.

Element 5 charges between £480 and £1,400 to enable a site for its system, plus a commission of five to 25 per cent depending on volume. [www.element5.com](http://www.element5.com)

## On offer: a poster-sized aerial view of your home



Getmapping, which offers aerial photographs of any part of Britain, has extended the maximum land area pictured to two square kilometres. Prints are now available in sizes up to A2, and they can also be supplied framed.

The company is also offering 49 county CDs for £19.99, giving a seamless panoramic view of the area to a resolution of two metres. [www.getmapping.com](http://www.getmapping.com)

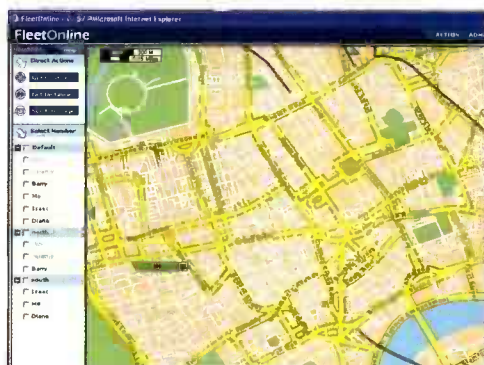
# Track your partner for 21p

A tracking system, much used by transport fleets, has been made available to the public so you can now track the location of a mobile phone to within 50ms for as little as 21p a time.

The Fleetonline system exploits the fact that cellular networks routinely estimate the direction and distance of a mobile phone relative to the nearest mast. You have to get permission from the owner of the phone that you wish to track, which is done simply by sending them an SMS message for confirmation.

When you want to know where they are, you simply go to [www.fleetonline.net](http://www.fleetonline.net), enter the phone number, and a map pops up showing its location.

The cost, between 21p and 28p, is added to your mobile phone bill so there is no up-front fee to pay. The system, which is supported by all the UK



Key in a mobile phone number at the Fleetonline site and you get a map locating the device

network operators, was designed originally for transport fleets too small to justify the cost of a GPS system. It will even give you a trace of the mobile's route over a period of time.

Managing director Erik Jansen admits that a husband or wife might surreptitiously enable a phone for the system – which only needs to be done once – to track their partner in secret. But he says there are

many occasions where parents or partners might want to keep track of family members legitimately. 'The most common thing people ask over the phone is "where are you?" but the person they are speaking to may not have time to answer. We allow them to get the answer without troubling anyone,' he said.

Of course, you could also use the system to track a stolen mobile, at least until the Sim card is changed. But it would be small comfort knowing its relative whereabouts, yet lacking the precision to get it back.

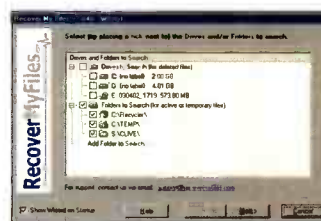
Utilities claim to find your lost data

## Utilities claim to find your lost data

The Windows Recycling Bin can give a false sense of security, as it keeps only files that you have deleted yourself. Retrieving files deleted by programs, or lost in other ways, has actually got harder over the years.

A program called Recover My Files claims to find files others can't reach by searching every sector of a drive for file remnants. It costs \$69.95 (£44) from [www.recovermyfiles.com](http://www.recovermyfiles.com).

Jufsoft takes a different angle with its latest Badcopy Pro 3.65, which is designed to recover damaged or lost data from floppy disks, CDs and memory cards. It costs \$39.50 (£24.70) from [www.jufsoft.com](http://www.jufsoft.com).



### Vigor Broadband Routers

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- Support for popular multimedia applications
- Easy configuration/monitoring from your browser
- Built-in 4-Port 10/100BaseT Ethernet switch
- See web site for full specification on all models

	Cable	ADSL	ISDN	Wireless
Vigor 2200E	•			
Vigor 2200X	•		•	
Vigor 2200W	•			•
Vigor 2200Wo	•			•
Vigor 2600		•		
Vigor 2600Wo		•		•
Vigor 2600X		•		
Vigor 2600W		•	•	•

Check web site for explanations of compatibility for each model

**New, for the Vigor2200USB!** Add the Vigor webcam and have a self-contained webcam server! The router will provide a continuously updated image to users on your LAN or to anyone else on the Internet from their web browser. Ideal for security or fun! Visit the web site for more details.

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[www.seg.co.uk](http://www.seg.co.uk)

**www.draytek.co.uk**  
Dealer enquiries welcome

Specification subject to change. \*Varies with model



# Computing's new wave

The IT revolution of the past two decades has moved into a new phase, with a trio of developments that could bring many changes in the way we live. Clive Akass reports

**T**hree developments are accelerating changes that have finally forced the music industry to come to terms with the Internet (see page 16) and their effects will spread far beyond the record companies. Always-on fast web links, cheap high-capacity storage and ubiquitous wired and wireless networking will change profoundly how we work, communicate and obtain information or entertainment.

This month's special report examines three aspects of this new wave of IT: the marriage of the handheld and Digital Audio Broadcasting (Dab); the larger untethered computer, as exemplified by the smart display and the changing face of broadband.

Today's entry-level broadband hardly lives up to its name by delivering just 500Kbits per second – 10 times faster than dial-up, yet barely fast enough for a video stream. I have been trying Telewest's pilot 2Mbits cable service, which is more like the web should be, delivering pages for the most part as fast as flicking through a book.

This should be the entry level, and it surely will be one day when the economies of access allows. Danes typically use links twice as fast, and Swedes commonly enjoy 10Mbits access, but their compact populations are said to be easier to mesh than the in Britain.

Of course, a slow server, or a sluggish link en-route, stays slow however fast your own line, so you are never immune from the world-wide wait. And today's content is designed for slow lines, which will not always be the case: pages are likely to pack more kilobytes as delivery speeds rise, so we will be clawing for faster links for a long time.

Currently, the problem is rather the reverse. There is little content available that needs 2Mbits, and so little incentive for people to pay a premium for the extra speed. This is a reprise

of the catch-22 that has long plagued the web: you won't get the content until you get the users, and you won't get the users until you get the content. 'This is why we are offering this service for the first time to consumers. Someone has to make a start,' said Telewest web consultant, Fergal Butler.

It has to be said that 2Mbits is also available from some ADSL operators, at a price. A second reason for the Telewest pilot (which was offered free on a first-come basis to 1,500 subscribers to its 1Mbit service) is to establish how much people will be willing pay. Not that these early adopters – keen online gamers, teleworkers, or

a dial-up phone call rather than messing with telephony over the Internet, which is not good at the timely delivery required. Operators, for a price, could set up an IP link of the required quality – and it could be used for video-phony as well. This touches a sore point, as videophones require bandwidth upstream, which is restricted to 250Kbits/sec even on the 2Mbits/sec pilot. It is likely to remain so. Butler blames peer-to-peer (P2P) users swapping audio and video files: 'If we increased the upstream speed they would simply swallow up the bandwidth.'

P2P users tend to blame greedy operators, record

portal that gives users much better transfer rates than the wider web. Dial-up users won't know the difference because their local link is usually the slowest in a connection.

With 2Mbit links and fast local servers, we have the start of a system in which you can have any amount of programmes, films, music and other material on tap. The BBC, which has one of the world's best content archives, already has this in embryo on its site where you can listen to recent radio programmes. Clearly, people will want scheduled programming too, but even this is changing with the advent of high-capacity storage.

Low-cost hard disks can easily store the equivalent of 25 movies, and allow you to time-shift TV to the extent that some in the industry believe that within 10 years only 10 per cent of programmes will be seen at the time they are put out.

Storage at the user end also gives operators the option of providing programmes as a single file on a low-quality IP stream, rather than broadcasting or streaming them in real time.

There are many possibilities here for a flexible pricing: you might pay more for an instant video-streamed movie, slightly less to have it sent as a file within a few minutes, or less still to have it delivered in the slack night hours.

Telewest's Butler reckons a content-on-tap system like this will be functioning within five years. Over at NTL Broadcasting, head of product development Simon Mason stresses that for a mass market such systems will have to be 'easy enough for my grandmother to use.'

It wouldn't be hard to design a graphical interface friendlier than that of the average video recorder. But there is a wider point here: some of the trickiest problems of this new wave of IT could turn out to be ergonomic rather than technical.



**You could time-shift TV on your PC, but all major vendors now offer dedicated personal video recorders (PVRs). This Toshiba RD-XS30 packs both a 60GB hard drive and a DVD burner supporting rewritable DVD-Ram and write-once DVD-R disks. But it lacks a network port that would allow it to act as a home media server. Its sibling, the RD-XS40 has one, but is available only in Japan.**

people sharing a connection – are a typical slice of web users.

In the long run, broadband operators are likely to move away from a flat-rate charge. The very mention of the possibility sends ripples of fury through web discussion groups, yet it seems a perfectly sensible move that could be good for all involved if properly implemented.

You would probably get a flat-fee basic service much like you do today (better, one might hope), though perhaps with a cap like the 1GB-a-day limit imposed two months ago by NTL. If you wanted a faster link for a while, perhaps to watch a film, you would pay a little extra and if you visit an online shopping mall, say, the faster access might be paid for you.

But you'd pay for quality of service as much as speed. Indeed you do already when you make

companies, movie companies – everyone, that is, except greedy P2P users. The problem lies not with their own downloads, so much as the fact that their machines act as file servers for others, crowding out local traffic.

The cap on upstream speeds is one reason for the relatively slow take-up of videophones (or video messaging) and remote surveillance, which are sure to become major web applications. They could be seen as intrusive and oppressive but on the plus side they could transform the lives of housebound people by easing their isolation. Working parents could check up on their children, or see whether it was a thief or the cat that tripped the burglar alarm.

Fast downstream speeds give the operator a chance to establish a potentially profitable

# TV over the radio? It's in the picture

**Y**ou could be forgiven for feeling confused at last month's report that NTL and London-based Radioscape demonstrated the transmission of TV images to a PDA using a Digital Audio Broadcasting (Dab) signal. TV over radio, digital or not, seems to make about as much sense as flying through mud, but it's not as daft as it sounds.

Dab is set to replace analogue radio as soon as enough of us can be persuaded to buy the receivers. This won't be very soon as, although early models have sold well, the cheapest is still around £100 – 10 times the price of a cheap analogue set.

Dab channels have far less bandwidth than TV – around 200Kbits/sec, only 20 per cent of which is allowed to be put to non-audio use. So far this data has been used to transmit little more than programme details, but the possibilities multiply as receivers get more intelligent. At last, one Far East manufacturer is developing a Dab-enabled handheld computer, which could also pack two-way links such as GPRS/3G and Wifi. Three factors make these 'Dab handers' interesting:

First, video on a small screen does not require the bandwidth of full-screen TV.

Second, solid-state memory cards are getting cheaper and more capacious, enabling mobiles to support the kind of caching and time-shifting that is

emerging on the home systems being developed. As PCW reported last month, Compact Flash cards can now hold 4GB, which is almost as much as a DVD disk. Smaller capacities are quite affordable.

Finally, Dab is designed for mobile use. One of its aims was to avoid the fading caused by interference between multiple signal reflections in built-up areas. Dab processes these reflections so as to reinforce the signal.

According to Simon Mason, head of product development at NTL Broadcast, Dab TV image quality using the latest compression techniques is 'not so hot for sport [because fast changing images don't compress so well] but fine for talking heads.'

NTL is not about to start a mini-TV station, but is simply looking at ways to exploit the possibilities of Dab. One is location-based services. Mason envisages that you could use a standard web link, via Wifi or a docking station, to download basic data for an area you are visiting. When you reach the area, the local Dab station could 'trickle charge your device with low-latency information.'

This means weather and traffic updates, hotel availability and information on events which would be sent repeatedly with the station's audio data stream. Clearly, this could be financed by sponsorship and

adverts. The system could also be used for selling all kinds of digital content. A record company could broadcast its top 10 records, and charge you an unlock fee for a permanent copy. This is a more efficient and neighbourly way to distribute music than P2P, and if providers don't get too greedy it could kill off a lot of piracy.

Microsoft stands to make a lot of money if this system takes off because NTL is using its media player and digital rights system. Mobile phone operators could gain revenues by providing a back channel for responses and purchases.

'I am absolutely confident of the technology,' said Mason.

'But we can only take it forward with partners. We need to partner with four or five big content providers.'

Perhaps the most significant aspect of all this is that it shows the mobile computer developing as a medium in its own right, a love child of broadcasting and the web. TV is a 6ft medium: you sit that far away from it, which is good for images but not text. A Dab mobile is a 2ft medium, good for both images and text – the images may be smaller, but they are closer. It can be TV, radio, audio player, video player, book, phone or web page – or it can be all of them at once. Who knows what is going to be done with it when people discover its potential?



Dab radio receivers cost more than analogue models, but prices are falling. Early models like this Evoke-1, from Pure Digital (part of Imagination Technologies), have become something of a cult purchase, costing just under £100

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# An alternative to taking Tablets

The smart display is a blank slate that gives us scope to design the computer of the future

**T**he mobile computer has long been expected to evolve into the new book, the dominant medium for reading, though paper will not be supplanted altogether. Fast wireless network links have brought the prospect closer, alongside technologies like Dab, with its potential for multimedia broadcasting (see page 31).

Mobiles, like books, will come in all sizes. My guess – contested by many in the industry – is that the palmtop will supplant the mobile phone (especially the Smartphone) as the most-used pocket device. For heavy use, people will turn to something the size of a sub-notebook.

This assumes that data input moves beyond the keyboard, a direction in which Microsoft has made a major, if not definitive, move with the pen interface on the Tablet PC. A better pointer to the future is the Tablet PC's superficially less interesting poor relation, the smart display.

Both devices are pen-driven tablets and use Windows XP, but the smart display is simply acting as a remote terminal for a desktop PC. It sends keystrokes (translated from pen strokes) to

the PC over a Wifi link for processing, and then the PC returns screen updates. This needs surprisingly little bandwidth – not so long ago people were doing something similar over 28K modem links. Corporates have used the setup for years, only the displays were called Windows terminals.

Microsoft decided the time had come for this concept to hit a wider market. Flat-panels were beginning to replace CRTs, and these could be given enough basic intelligence at little extra cost to allow users to lift a display from its cradle and carry on working away from the desk. A hardware spec was sent to manufacturers, and Microsoft tweaked Windows CE to run it.

There are snags. You need to be within wireless range of an XP PC. First-generation models are far too expensive and Microsoft has severely limited what you can do with them. Also, you want a big display on your desk and a small one on your lap, which rather negates the selling point.

I've been trying Viewsonic's 10in Airpanel V110, which is around the right size for off-desk use. So what makes it so exciting?

First, it gives you desktop computing power with much reduced battery drain. You can save more power by switching on and off without disrupting the remote processing (though the resume function is not quite instant) and so the effective battery life can be well over the nominal four hours – and it runs cool. It could be slightly smaller and lighter but it gives you an idea of the size, battery life and power of a near-future 'tablet'.

Second, it draws resources from the network. Future mobiles will have far more onboard resources, but they will also make comprehensive use of the intelligent environment. They might, for instance, save battery power by off-loading processing – probably without you being aware of the fact. Or you might point your mobile at your hotel wall and summon



Photoshop to view your snaps. In the US, the V110 is sold with a TV remote, which is the start of a control system that could be used to summon video, music, and other entertainment. This is getting to look like an embryonic universal interface (see **PCW number 1140586**).

What is most appealing about the smart display is that it is a *tabula rasa*, a kind of blank slate on which to design a machine from scratch, while retaining backwards compatibility.

In fact, it is more mode than machine, because virtually any computer can be made to act as one. It lets you go off at a tangent from the classic PC hardware and software and yet still run Windows if you wish.

There is much more to decide. What software to run? What should run on board, and what should be left to the network? What ports to have? What wireless links? What physical controls? What interface? It is a designer's dream. Whether any will realise it is another matter.

Stephen Yeo, director of marketing at Wyse, which has been making Windows terminals for years, is sceptical. 'If you had a Linux-based machine, say, it would always be behind because Microsoft would simply introduce new features to stay ahead,' he said. Yet in the long run, Microsoft could draw revenues from the use of networked software. But in the short term it seems nervous to give the smart display too much rope. You can't use the PC and the display at the same time, and you get PDA-class script recognition instead of the excellent system on the Tablet PC.

**The Viewsonic Airpanel V110 costs £866 (ex VAT) with Wifi base station. Note that this model cannot double directly as a monitor: it has to use the Wifi link. Smart display prices are expected to plummet**

Input remains the single biggest problem for all these mobiles. No one has cracked it and no single system is likely to: communication with computers is likely to be as complex as it is between humans, using a combination of pen, voice and even expression (see page 17).

My own humble attempt to use multi-modal input (as the jargon has it) shows the smart display's current limitations.

I wanted to use a GNNetcom 9210 cordless headset for input to Word using Dragon Naturally Speaking 6 (DNS) speech recognition. The 9210 uses Dect wireless, like a cordless home phone, so it would not interfere with the Wifi link, which in Europe uses a different frequency.

My reasoning was this: the V110's pen is fine for editing text but not for writing entire articles, while DNS works well enough to be useful, though it makes mistakes and is not good for editing. So a combination of the two could be very useful.

I first set up the 9210 on my desktop machine. It did not quite produce the accuracy of the DNS-supplied wired mic, but it worked. When I switched to the smart display, the host PC disabled the 9210 input: it simply would not listen to me.

Nancy Nemes, smart displays product manager for Microsoft Europe, could not give a direct explanation of why this was so, but she said: 'We have not implemented everything on the first version of the smart display. And some things we have left for third parties to do.'

Oddly enough, it might be better if Microsoft goes slow on the smart display. Others might move in and explore the possibilities without being swamped by the old ways.

**Clive Akass**



**The GN 9210 headset costs £250. An extra USB gizmo is required for use in speech recognition – price to be announced. [www.gnnnetcom.com](http://www.gnnnetcom.com)**

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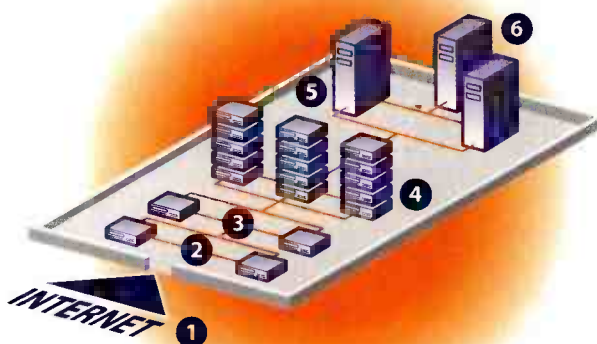


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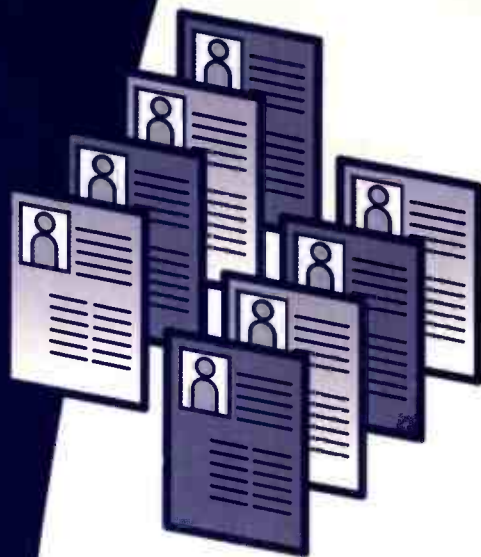
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# Microsoft moves on mobiles

Developers are being wooed to produce killer apps for new .Net-enabled versions of the Pocket PC and Smartphone. But this is one space Bill Gates will not own, says Tim Anderson

**M**icrosoft will launch a new generation of its Pocket PC and Smartphone platforms this year, the company announced at the Mobility Developer Conference in Paris. It handed attendees software development kits for the new Pocket PC, codenamed Ozone, and referred to the new Smartphone as 'v.Next'.

Microsoft arrived late to the world of mobile devices, and while it has carved out some PDA market share with Pocket PC, it faces a huge task in establishing the Windows-powered Smartphone. Unfortunately for Microsoft, the market for mobile phones is larger than that for PDAs – and the two dominant handset vendors, Nokia and Ericsson, appear set against using its software. With other leading vendors, they share ownership of the rival Symbian OS; Sun's Java is also widely deployed.

But there is lively developer interest in Microsoft's mobility platform. Attendance at the conference – held with Microsoft partners like HP and Orange – was 35 per cent up on last year. So what's the attraction?

Both the Smartphone and Pocket PC use versions of Windows CE, which supports a subset of the Windows API. It's bigger and slower than the Symbian and Palm operating systems, which were designed from the start to work on handheld devices. But it does present developers with a rich and familiar platform.

Mike Silvey, of Windows mobile developer Dexterra Inc, told *PCW*: 'Unless you've got a strong bent for Microsoft, the Palm is a much easier operating system for personal information management [Pim] – so that's led a lot of companies to deploy Palm. But the Palm is awfully weak when it comes to the deployment of enterprise applications. People look at Pocket PC and say: the Pim is not as clean as Palm, but there's a lot of power here.'

The new generation platforms are based on a new version 4.2 of Windows CE that features a re-engineered Pocket Internet Explorer, with support for XHTML, CSS, JScript 5.5, and the new standard Internet Protocol IPv6. There's also integrated support for Bluetooth and 802.11 wireless. But the biggest new feature in both Ozone and v.Next is the .Net Compact Framework (CF) in ROM. This is a runtime layer that isolates applications from the operating system, managing memory and enforcing security. It should prevent buggy apps from crashing the device.

Developers can write CF applications in languages like Visual Basic and C#, which are more productive than C++. Although similar in some ways to Java, the .Net CF has better integration with the full range of device features. Applications sell devices, which is why Microsoft is wooing developers.

Launched at the end of 2002, the Orange SPV is the only Microsoft Smartphone on the market. Microsoft's other launch partner, Sendo, withdrew acrimoniously at the last moment. The SPV is powerful, but spoilt by somewhat awkward buttons, short battery life, and more than its fair share of bugs. Around 60,000 units have been sold in

Europe. It's a start, but a tiny figure in context. Worldwide annual mobile phone sales exceed 400 million, with over 150 million in Europe.

I asked Nick Balderson, vice president of product and infrastructure at Orange, why his company and Microsoft risked the reputation of the Smartphone by launching a buggy product. He said: 'The first release did have some 'features' in it, there's no doubt, and we've been working hard with HTC [the Taiwanese manufacturer] and Microsoft to resolve those. We've recently put out Update 1.35, which resolved a number of those high-priority features and nearly doubled the battery life. When we bring any of the phones to market they have some issues. This is also the first phone ever that we can fix in the field. Had it not been for that, we would have taken a more conservative approach.'

This 'release-first, fix-later' strategy is risky, but developers still like the platform. Orange also has a revised hardware design, the SPV E100, which fixes usability issues. But why does Orange bother with Microsoft when Symbian, Palm OS and Java are also compelling?

Balderson explained: 'From an operator's perspective, it's not in our interest to have any one dominant operating system. Our ideal world would be that we have a range of devices across all of those operating systems.' To make the point, Orange announced in April a deal with Handspring to develop Palm OS devices.

Some vendors, such as Sendo, found Microsoft impossible to work with, particularly when it tightly controlled its Windows source code. Did Orange have similar problems? Balderson said: 'It's been a joy to work on the project. We've worked closely with HTC and with Microsoft. I recently had a meeting around what we'd like



**All fixed up: Orange's SPV E100 is an update of the only Microsoft Smartphone on the market**

to see in future versions, and sat down with the guy who actually writes the code for that particular part of the OS.'

In the fog of accusation and counter-accusation, it's hard to discern the facts, but clearly Microsoft treats Orange well. It also seems to be gradually opening up its source code. It has announced the Windows CE Premium Derivatives License, which lets vendors both see and, crucially, modify the source for their CE-based devices.

Microsoft's Steve Clayton said things are coming together for Smartphone. 'Currently we have HTC, Compaq and Samsung manufacturing. On the operator front, we have Orange, T-Mobile, and Smart in the Philippines. The launch was, in our eyes, a big success.'

Industry politics make it highly unlikely that Microsoft will ever dominate phones in the way that it does the PC desktop, but there's room for Windows alongside its competitors in this vast market.



**Orange's Balderson: 'It is not in an operator's interest to have one dominant operating system'**

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# Letters

## Big shift is upon us >

I enjoyed your leading Editorial in the June issue of PCW and was struck by its timeliness, as the next 'big shift' is already discernible. Ten or so years from now I reckon we'll all be wondering how we managed without home networked multimedia centres.

I would regard myself as a knowledgeable, rather than advanced, PC user – with most of my knowledge gleaned from PCW. Nonetheless, whereas six months ago I was looking to buy a HDD/DVD recorder for PVR purposes I am now convinced I need to build a media network server.

To this end I am planning to buy a Shuttle SN41G2, fitted with a Hauppauge WinTV PVR-350 and Sony DRU-500A. Then all I have to do is figure out a way of programming and distributing the output from my multimedia devices over Ethernet.

Derek Seddon

**Dylan Armbrust replies >** If you want some tips on streaming, check out this month's Mobile computing Hands on column on page 199.

## A cap on broadband >

I feel I must respond to your June 2003 Letter of the month from Martyn Winters. He claims to be a 'relatively normal'

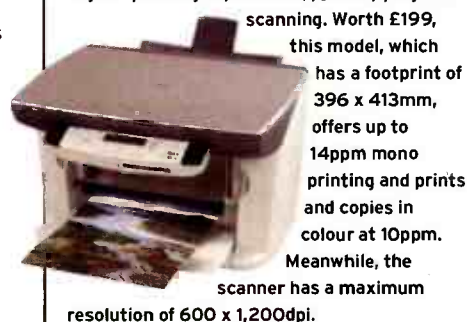
broadband user, yet he says he is regularly hitting the 1GB limit imposed by NTL. Let me give you another set of figures. I run a 50-user network for a SME textile manufacturer, and I have connected this network to a standard £30 per month ADSL line. All of my users browse the Internet and use email. However, the daily bandwidth I record for the whole network is approximately 50MB, give or take 20MB. So Mr Winters' daily traffic of 1GB must surely include a huge amount of peer-to-peer (P2P) file sharing, with or without his knowledge.

Given the problems I used to experience when on ISDN (and still do on occasion even with my home ADSL provider) with unresponsive web pages and terrible connections, I feel that bandwidth capping is the best way to curb the five per cent of Internet (ab)users that use 85 per cent of the bandwidth. A colleague of mine has a 1MB NTL connection and regularly brags about the things he's been getting from P2P file sharing. I genuinely feel sorry for any other NTL user in his area, as their connections must suffer terribly when he's getting all these 'things'.

Taking this capping idea to its logical conclusion, if you paid for your broadband by bandwidth usage (eg £2 per 100MB, which for my usage would be about £1 a day – perfectly acceptable), then swapping large video files

The author of the Letter of the Month will win a Canon Smartbase MPC200 multifunction device.

Aimed at the home and small office user, the MPC200 offers direct photo and regular printing capabilities, plus copying and



scanning. Worth £199, this model, which has a footprint of 396 x 413mm, offers up to 14ppm mono printing and prints and copies in colour at 10ppm. Meanwhile, the scanner has a maximum

resolution of 600 x 1,200dpi. For more information on Canon products, go to [www.canon.co.uk](http://www.canon.co.uk) or call 0800 616 417.

**Canon**

over P2P becomes not only time-consuming but costly too. To swap (or steal) a standard DivX movie (700MB) would be £14. All of a sudden it's cheaper to go and buy the DVD, get better quality and all of the extras that the movie studios want you to have.

Even for those of us who are fortunate to

## Letter of the month

### Recordable DVD formats >

There has been much written in your magazine over the last months and years about recordable DVD, with many articles claiming there will have to be one victor. One such article (News, June issue) quoted Simon Shepherd, an analyst at IDC, saying there is no room for so many formats. I have to say I think he's wrong. We are no longer looking at just the PC market, but also the home entertainment market.

All three DVD formats are used in Personal Video Recorders and all three have had a high take-up. By far the superior format in this field is DVD-Ram – due to its random access, reliability and speed. Yet those in the PC industry feel this is a format that should die. Why, because it does something completely different from the other formats!

Why should either DVD+RW/+R or DVD-RW/-R (which offer similar benefits to each other) triumph over the other? With an already large, installed

user base there will still be a demand for media, so why should one cease to exist? Ultimately, the end result of recording on any of these disks is that files will play on most DVD drives.

The confusion caused by three formats is unfortunate, but multi-format recorders will hopefully ease people's fears of entering the DVD-R market. Yet all these formats bring something to the market, and I hope all three have a long life.

**James Lancaster**

**Clive Akass replies >** We have had heated discussions on just this point here at PCW, and I agree with much of what you say. I'd buy a combo burner supporting both DVD-Ram and DVD-R, rather than one offering DVD+R and DVD-R, because the latter offers no extra functionality other than supporting two pointlessly distinct formats.

Panasonic and Toshiba evidently agree with you too because they are still selling DVD-Ram products (see page 30). I fear, however, that you are rather too tolerant of an industry that deliberately confuses its customers in a scramble to get royalties.



be able to telework from time to time, the bandwidth used by XP's Remote Desktop is only a fraction of the bandwidth needed by P2P applications. Genuine web browsing and email use only a tiny fraction of the bandwidth available to a user of even the cheapest ADSL connection. If Mr Winters was correct in his contention that the ISP market is profiteering from a captive market, why did BTopenworld have to slash the Anytime connection package from unlimited to 150 hours per month? In my view, you don't need a rocket science degree to figure it out. The sooner a sensible charge for usage is introduced, the better.

Peter G Green

## Dab is no threat to music >

I don't think the music industry needs worry too much about Digital Audio Broadcasting (Dab is music to your ears, News, June 2003) and it's possibilities of downloading music in the style of Napster and its successors.

Not one radio station in the UK, digital or otherwise, can manage to play a full song without spoiling it by talking over the first 30 seconds or cutting off the last minute or two for inane chat or adverts. Nobody who cares about music would want such spoiled tracks as part of their collection.

Andy Davis

## Boating and GPRS >

I read with interest Brian Slack's expensive experience with GPRS (A sorry tale, Letters, June 2003). I too own a boat (I don't live on it though) and have for sometime now used a Motorola Timeport mobile phone. It has Wap capability and infra-red. I use a Fujitsu Lifebook with Windows 98, IE6 and Outlook Express.

I am able to connect to uk2.net at 9600 baud and receive emails from my university mailbox using POP3. Although the speed is slow it can handle text emails with ease and even Word attachments, if you are prepared to wait. I have even surfed the web and logged into my Hotmail account.

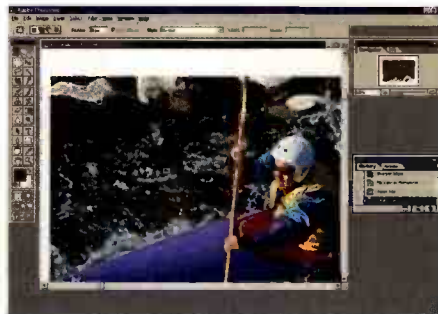
I use a Vodafone pay-as-you-talk plan that costs 2p a minute after 6pm and at weekends. But if you want access during peak hours, you could use an alternative that costs 35p per minute for the first three minutes every day, dropping to 5p a minute thereafter.

It may be slower than GPRS, but it is usable and much cheaper. My phone works equally well with any PDA that has infra-red capability. My advice to anyone thinking about mobile computing using phone services is to wait until GPRS drops significantly in price.

John Ryan

## Performance judgement >

I have been reading *Personal Computer World* for many years now, but have recently been concerned about how you make performance judgements. In fact, some current conclusions appear to be



Our rigorous VNU Labs testing uses the best industry-standard benchmarks

giving out false information to your readers.

My issue is with the Sysmark 2002 and 3DMark 2001 tests, which you use exclusively to test system performance, but especially with Sysmark 2002.

Sysmark 2002 has a rather worrying bias towards Pentium 4 systems and there has been some discussion as to whether this was deliberate due to the poor performance of the Pentium 4. As such, any result PCW gets from this benchmark should be taken with a large grain of salt. For example, the scores in Internet Content Creation show that no Athlon system can match even the slowest Pentium 4 system – this simply isn't true in real world benchmarks. 3DMark 2001 is a slightly better benchmark as it does not have such a bias built into it, but it is still a synthetic benchmark. Essentially PCW takes two synthetic benchmarks, one with a substantial bias for a certain type of system, and then judges a system's performance based on this outcome.

James Stormont

## Kelvyn Taylor, General Manager, VNU

**Labs replies >** James, I have to say we strongly disagree with your assertions. VNU Labs uses industry-standard benchmarks to conduct performance evaluations. For overall system performance we use Bapco's Sysmark 2002, which is not a synthetic benchmark as you state, but an application-based benchmark that uses full versions of market-leading applications. It runs realtime scripts that accurately reflect usage patterns for business users. I should also point out that Bapco's members include both AMD and Intel. In addition, performance is only one part of the equation when systems are evaluated.

Our recommendations are based on all the factors affecting a PC's suitability for its task – such as value for money, features, build quality and so on. As for 3DMark, we make use of both the 2001 and 2003 versions, the latter accommodating DirectX 9-compatible cards, and we feel it provides the best overall picture of a graphic card's capability. 3DMark 2001 and 2003 are synthetic tests. Our application game test is Unreal Tournament 2003 Demo, which gives a repeatable measure of the performance expected in a modern game.

## Last Word on Henning 1 >

I am writing to comment on Ed Henning's column (Dispose of Today's Throwaway Society, June 2003). As a PC hobbyist, rather than an IT professional, I enjoy reading Ed's more general opinions, but as a regular Green voter I feel I must object to his slur against 'Environmentalists'. He says: 'Environmentalists talk endlessly about recycling: important, yes, but is it really the solution? I think not – what is needed is a change in manufacturing and use.'

The main plank of the 'environmentalist' argument is not recycling but sustainability. Which in broad terms is the 'change in manufacturing and use' that Ed puts forward. Borrowing someone else's idea, putting it forward as your own and inferring they could not have thought of it in the first place? If the journalism ever falls through, Ed, a career in politics may be an option.

David Lim

## Last word on Henning 2 >

Ed Henning's column (PCW, June issue) about recycling and resources was spot on. I have been writing to computer magazines for years asking them for more coverage of the issue of waste, since all computer magazines tell you about all the new hardware that is coming out, and encourage you to consume more – but never give any advice about what to do with the old item (which can often be in good working order).

The first word in the trio 'Reduce - Reuse - Recycle' is the most important, and I have long thought that computer magazines should heed it, and not promote ever-greater consumption. They should also pay more attention to the other words, and give practical advice on how to follow those tenets in respect of computer hardware and software.

Karl Drinkwater

## Clarification

The prices for the Viewsonic Smart Displays on page 69 of June issue were incorrect. The correct prices were £866 (£737 ex VAT) for the V110, and £1,088 (£925.95 ex VAT) for the V150. Apologies for any confusion.



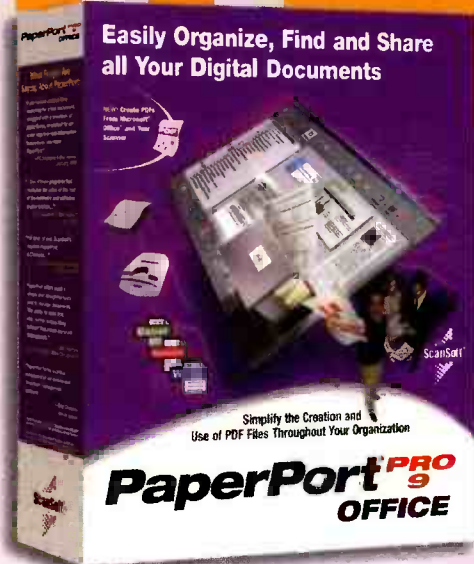
Was Henning green in judgement, or should he consider a career in politics?





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# Microsoft faces a taxing dilemma

Guy Kewney asks if politics will bring down Microsoft, before market forces and a corporate backlash do?

It should be no secret that the European Commission is worried about Microsoft's influence on the economy and the IT community, and is investigating ways of avoiding its monopoly abuse of power. It should also be no secret that whatever the EC actually decides is most unlikely to produce an effective way of curbing that monopoly – if it does decide it's a monopoly.

However, if I were planning strategy at Microsoft HQ in Redmond, I'd be more worried about 'market forces' and, particularly, the reluctance of corporate finance departments to pay increased software licence levies, or what I'll affectionately call the Microsoft tax, which is going to go up.

The first time Microsoft told me about its .Net strategy, it seemed just a me-too way of getting back at Sun over the Java battle. Sun wouldn't let Microsoft take over Java, and so Microsoft decided to play with its own ball. Or so it seemed to me, but I now think I was completely wrong.

The thing that Microsoft has to do – more than anything – is to grow. It may be huge already, but its financial future depends on the confidence of investors that it will continue to expand. Three growth options are available, increase the number of personal computers, move into new markets and move into the IT infrastructure.

The number of personal computers, surely, is at a maximum. The number of machines sold each year may rise again, but there will never be noticeably more PCs in the world than there currently are. Everybody who comprises this market has one, and almost nobody needs more than one. The Microsoft tax is payable per machine; therefore revenue stays the same.

There are other devices that can carry a Microsoft tax. PDAs, for example, the Pocket PC, the Smartphone, the portable Windows Media Player. The move into new markets is a gamble that is far less likely to succeed. The phone business turns over a hundred times as many units as the PC business, but the fees paid are one per cent of the PC fee. And can Microsoft really dominate that market as it does the PC business?

The arrival of Windows Server 2003 marks the success of the move into IT infrastructure. It puts Microsoft on level terms with IBM and Sun – or it will do, if it truly works.

Naturally, there will be those who argue, eloquently, that Microsoft will not be able to succeed. I think I'll save those arguments for another day, and just say that it has succeeded before, when all the pundits said it wouldn't.

But success in IT infrastructure isn't necessarily going to make Microsoft twice as big as it is today. The licence fees you get from corporate servers are traditionally huge. But Microsoft has broken into that market primarily by charging less than the incumbents. Compare the cost of an SQL Server licence with what Larry Ellison's Oracle would ask per user, and you'll see that the earnings are set to fall on a per-seat basis in this industry.

So what it comes down to is that Microsoft can grow quite a bit on the basis of new industry, quite a lot on the basis of getting into IT, and maybe a little out of the media business – digital rights management of movies and music, for example. Then, it has to perform a miracle – or, lacking a miracle, increase the tax. It has to go to the PC makers and say: 'You're paying too little per computer; pay more, pay double, pay treble. It's still a small proportion of the total cost, you know.'

Well, maybe. But corporate PC buyers don't like that. They are squirming under the prospect of having to pay the full, recurring cost of licensing Windows every year, if

XP copy protection succeeds. And if the cost doubles, or trebles, the squirming will turn to squealing, and then screaming. They will, in short, try to find an alternative. Until recently, the Linux and Open Source alternative was dismissed. Open Source plays a small (but growing) part in corporate servers, but desktops are all Windows, but the tide is turning. Linux is far more secure in terms of viruses and in terms of preventing unauthorised user-loaded

software. All it really needs is Open Office to succeed.

Five years ago, I wrote that the obstacles facing Linux were huge. If you wanted to hire someone to do the accounts for a month you could easily find someone with Excel experience, but no temp agency would provide you with someone to use whatever Corel toy was current. Is that changing? Does Open Office allow Word and Excel and Powerpoint experts to apply their expertise? Perhaps, not quite yet – but maybe soon.

If the corporate financiers squeak and squeal enough, the beach defences Microsoft is trying to set up against piracy and licence evasion could find the incoming tide will simply go round behind them. I think the trend of the next two years will be an increasingly irresistible pressure to switch to desktop software that carries a lower tax than Windows does. Inevitably, this will mean gradually higher fees for the open source applications, as their support costs standardise. Maybe it will allow Microsoft to claim that it really isn't a monopoly after all, but then, I never expected that to bother Redmond much.

**'Microsoft maybe huge already, but its financial future depends on it continuing to expand'**





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# Let me show you my digital snaps

We all have multimedia collections that we'd love to view or listen to all over our homes, says Gordon Laing

**A**s somebody who rarely tunes into the radio, I was a little taken aback during a recent survey to realise I owned six boxes capable of receiving transmissions. Curiosity aroused, imagine my surprise to count no fewer than seven devices which could play CDs. Before you consider me spoilt or foolish, take a moment to count your own, not forgetting to include PCs, alarms, portables, ghetto-blasters and in-car units.

The point of this exercise is not to illustrate consumer greed, but the fact that we commonly listen to audio throughout our homes, as well as in our cars or even when out walking. The story's similar with TV – we watch it in lots of places. It's these very traits that the IT and consumer electronics industries are banking on as they prepare to sell us new multi-room equipment.

Of course, with radios, CD players and TVs located throughout our homes, you could argue we've already got music and video wherever we want them. The big difference with forthcoming products, though, is their use of existing and growing media collections on our PCs, such as mp3 music, digital photos and even videos.

Rather than playing media directly from PCs though, we'll access them across a network using cheap, friendly client set-top boxes in every room. With a proper Ethernet network as the backbone, multiple clients could simultaneously play the same or different files, leaving the PC out of sight and earshot.

At this point you'll either be punching the sky in joy, or, more likely, wondering what all the fuss is about. I must admit to being in the latter category, having resisted the urge to rip a collection of CDs onto my hard disk or wait an age to download videos from the web. Clearly the entire networked media sharing exercise is pointless without a media collection in the first place.

But then I realised I actually did have a significant media collection on my PC. As a digital camera owner for three years, I'd accumulated over 2,500 photos, and that's even after deleting the embarrassing ones.

The trouble with digital cameras, though, is you rarely end up seeing your images. You could print or email them, but generally leave them on your hard disk. I like making TV slideshows of my photos, but each involves copying a handful of images back onto the camera then connecting it to the set. I can rarely be bothered.

Then Windows XP came along, delivering instant slideshows from my entire collection – photos I'd long forgotten about flashed up on my screen. I was hooked

and can certainly see the appeal of easily viewing the same collection from any TV in my home.

Sharing also changed my viewpoint on having a PC-based music collection. The time taken to build a significant library can easily be justified if you're able to re-use it on various portables or in-car systems. So, despite my original scepticism, I've now come round to the idea of building a media collection on my PC and accessing it around my home – but for the concept to work, you'll also need affordable network media players.

The good news is this market is set to explode with companies like Sony and Philips already demonstrating set-top boxes with Ethernet capabilities and AV connectivity to a TV or hi-fi. Simple built-in operating systems then navigate media collections on a networked PC and stream them as required.

This is pretty much all they'll do, though, and they're also likely to cost around £300 each – a price which today buys two, or even three, DVD players that can also spin CDs and often several other formats. Of course, they can't

stream your networked media, but ultimately, the price has to be right if you're supposed to buy several units.

The really annoying part is with built-in mpeg decoders and AV outputs, every DVD player could actually double as a networked media player with little modification – all it would need is an Ethernet port and sufficient nous to go looking for networked files. Digital set-top boxes are also in the same boat.

This is why, despite committing to building a media collection, I'll personally be holding back on buying dedicated client boxes until they either offer greater facilities or simply become more competitively priced. Ultimately, I'm fed up with buying duplicate facilities and am on the lookout for a single, cheap device which will do it all. Almost unbelievably, I think I've found it, sitting right under my nose.

I won't win any friends at Microsoft for pointing this out, but its Xbox console can be fairly easily modified to become a networked media player, while still offering decent games and DVD facilities. Best of all, at just £129, this truly is a device you could afford in several rooms.

I know it's breaking the rules, but a modified Xbox really is the closest thing to being the perfect networked client. Certainly, if Microsoft officially equips this or the next Xbox with media-playing software, I'd say it's got the market truly cracked. Until Microsoft does the right thing though, the only way I'll be listening to music throughout my home will either involve my soldering iron or getting to know more radio shows.

**'It's breaking the rules, but a modified Xbox is close to the perfect networked client'**

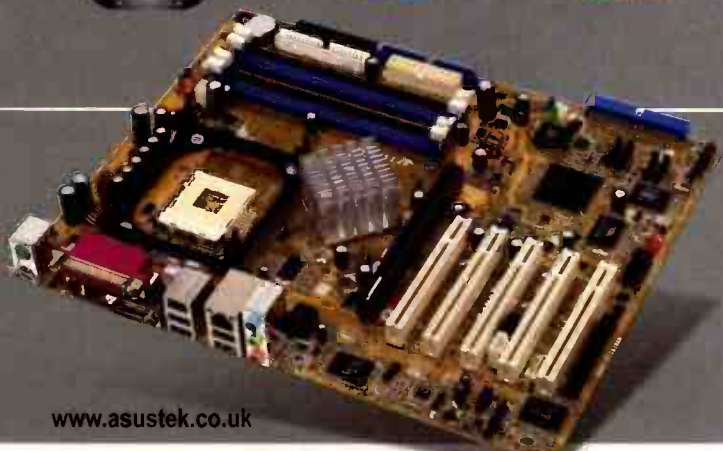
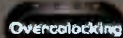
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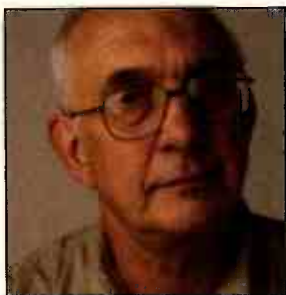
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## A recurring dream is back to haunt us

We're all drowning in data, observes Barry Fox, but where are all the new storage technologies to cope?

**C**CTV cameras round the world are generating gazillions of gigabytes of video. So are movie studios, TV stations and news channels. The Internet is drowning us in data. Publishers keep printing more words and pictures than anyone can hope to read. Doctors are flooded with medical information and the police are sinking under the weight of forensic evidence. It's information armageddon!

All the new optical disc storage formats are obsolete before they are launched, while hard disks are too expensive for archiving. So the idea of a new tape system with higher capacity, rapid access and a transfer rate fast enough to cope with live video is guaranteed to excite investors. City analysts are now being briefed.

O-Mass is the name, Tandberg is the developer and Imation (the 3m spin-off) the \$5m backer. One small half-inch tape cartridge holds 1.2TB (terabytes) – before any compression – with data streaming at 64MBytes/sec. Imation thinks it can push the capacity to 20TB per cassette. Commercial launch is scheduled for next year.

O-Mass uses the magneto-optical technology used on discs like Minidisc, and adapts it for use on tape. The O-Mass read/write head records 32 parallel channels magnetically and then reads them optically. Because the data is spread so wide, the tape length is short, and access to any point in a recording takes 3.5 seconds.

Anxious to learn more about O-Mass, I ploughed through a huge pile of paper used to brief the investment analysts. At first it looked very impressive, but then the gaps started to show. Too much of it was powder puff promise, repeated in different words, with next to no hard fact.

The tape is magnetically recorded by a thin film-inductive head and then read by a Silwag (solid immersion lens without air gap), the notes said. And whereas conventional magnetic head technology uses 'interleave' to compensate for head element spacing, O-Mass has guard bands positioned only between packages.

I asked Imation what it meant by Silwag. Was it perhaps using a liquid between the optical head and tape? And what did it mean by guard bands only between packages? Imation passed my questions to Tandberg. Jorn Raastad replied: 'We are no longer using the Silwag. Feel free to ask questions as needed.'

So if not Silwag, what are you using, I replied. 'We do not currently have the 'bandwidth' to support you the way we would like to do,' was the only answer I got.

Imation then sent me yet more of the puff it was feeding to the analysts. As American baseball player Yogi Berra so famously remarked: 'It's *deja vu* all over again'.

I've seen this happen so many times before. Great promises are made for exciting new technologies that fail to materialise.

'The Dataplay era begins' screamed adverts in the music press in March 2002. 'Dataplay combines all the advantages of a new digital format with small size'. Everything digital will be playing on Dataplay, promised the company's brochure: 'Computing, e-books, games, music, imaging, wireless.'

Imation was once again backing the idea, and heavily promoted the UK launch which was scheduled for the Stuff consumer show in October 2002. The prize: a 32mm double-sided disc in a cartridge around the size of a 50p piece that could hold 500MB of data. But Dataplay achieved the dubious distinction of going belly up the week before it was launched. It was not hard to see why.

The Dataplay concept dated back to 1999 and was unveiled in Las Vegas at the Consumer Electronics Show in January 2001. Eastman Kodak, Intel, musician David Crosby, Toshiba and Universal Music Group put up \$119m (£74.4m); BMG and EMI pledged to release music alongside Universal; Imation built a disc production line in the US; and Toshiba told record companies it would be able to sell discs with pre-recorded music on one side, and the second side blank for downloading. But Dataplay never

implemented the erase function and the only discs were write-once. The FAQ on Imation's website hedged the issue: 'Imation Dataplay Digital Media is write-once. Future Dataplay offerings may be rewritable.'

After a couple of years Toshiba lost interest because of the difficulty of making the technology work reliably at a reasonable price. The cheapest recorder from China was set to sell at \$319 (£199).

Just as the Stuff show opened in London, Dataplay admitted it could not raise the \$50m needed to keep going, and sent its workers home on unpaid leave.

Dataplay filed for bankruptcy protection last October. In March 2003 a court in Denver, Colorado said a company called DPHI Acquisitions could buy what remained of Dataplay for \$1.3m (£0.8m) and rehire 10 to 15 of its engineers. There's now talk of raising another \$10m to \$15m from venture capital investors, increasing the capacity to 650MB and then using blue lasers and multi-layered discs to hit 8GB by 2005. It's like *deja vu* all over again. And it's no solution.

**'Great promises are made for exciting new technologies that fail to materialise'**

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Ideal Computing	<a href="http://www.idealcomputing.co.uk">www.idealcomputing.co.uk</a>
Insight Direct	<a href="http://www.insightdirect.co.uk">www.insightdirect.co.uk</a>
Micro Direct	<a href="http://www.microdirect.co.uk">www.microdirect.co.uk</a>
Scan Computers	<a href="http://www.scan.co.uk">www.scan.co.uk</a>
Simply	<a href="http://www.simply.co.uk">www.simply.co.uk</a>
Easy E Trader dabs.com Ltd	<a href="http://www.easetrader.com">www.easetrader.com</a>

#### Retail Shops:

Name	Tel No.
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NetHighStreet.Com	01217 533 487
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CCL Ltd	01274 471 208
Kustom PC's	01292 90 909
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Name	Tel No.
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# Here's to absent online friends

Nik Rawlinson comes up with a cunning plan to keep tabs on all of his online pals

**W**hat is it about people called Tony? I've known only two Tonys throughout my life and I have no idea where either of them are any more. For all I know, they could be dead, and I guess, to all intents and purposes, they are.

You see, I met them both on the net, and when you lose email contact with someone who has no web page, you've got no way of knowing whether they are happy or not, healthy or not, alive or not. The one fundamental flaw of online communication is that it requires the active participation of both parties, unlike the phone, when the moment the person you are calling says 'Hello' you know they are OK.

Email, though, requires Tony (or Toni if it's a girl) to actually make an effort, and by mailing him or her yourself, you're asking them to do some work and put some time aside to mail back. It's not like real chat where you can just natter away while watching TV, and who ever mails back right away, anyway? Tonys are notorious for ignoring emails until they're less busy – and then, three weeks later, when the news is out of date, there hardly seems any point in replying at all. I know, because I've been a 'Tony' myself from time to time.

So I have an idea, and it's the only good use for combined advertising and cookie tracking I can think of. I don't have time to develop it on my own, so if you take it up yourself and make a fortune, then think of me and bung some cash my way to say thanks.

I'm calling it Project Lazarus. The most obvious domains to host it have already been taken, unfortunately (although, as I write this, [lazaruslink.com](http://lazaruslink.com) and [lazarusnet.com](http://lazarusnet.com) are still free) but the idea is as yet untapped – as far as I know.

If you don't remember the story of Lazarus, he was a biblical character, who became ill and died, and who Jesus brought back to life several days later. What I want then, is a site that will do the online equivalent. In net terminology, you're only alive when you're logged on. When you're disconnected you may as well not exist as far as your digital friends are concerned, so Project Lazarus will keep them up-to-date on how you're doing.

You'd sign up to the service – which would be free, of course – and, once you'd entered the scantest of details about yourself, which might run to no more than your name and the town in which you live, it would drop a cookie on your system. Meanwhile, the Project Lazarus sales people would buy advertising on the web's most

popular sites. Each time one of the ads is shown, it would check your hard drive for the Lazarus cookie, and if it finds it, update its database to show you have safely logged on.

Of course, you're not guaranteed to come across one of these ads every time you fire up your browser, so there's a chance Lazarus might miss you for a few days. But, if it could secure enough reciprocal deals to be advertising as much as some casino sites or the X10 micro camera, then it would be only a matter of days between each update.

Now your friends, who either know about Lazarus already because you've told them you're a member, or who find it through the banner ads, will be able to look you up on the site and see that – phew – although they may not have heard from you in a while, you're still OK.

There are privacy issues here, of course. There are any number of reasons why you might not want people knowing you've been online. You could be deliberately ignoring their mails, for instance, or you might be on the run from some nefarious criminal gang, in which case there is a definite advantage to being thought of as dead, or so the movies would have us believe. In either of these cases, you could set your profile to only update if you specifically visit the Lazarus site, or you could password protect your profile and only give the details to your closest friends and family.

It could go further though, and be custodian of your email address, too.

Anyone who's lost your details could request them from the site. You'd be sent an email containing two links – the first to authorise the site to give the enquirer your address, and the second to refuse.

The best online ideas though, tend to be simple – sell books, get in touch with school friends, search web pages – and sites that have one clear focus are often those we like the most. Google, for instance, may now be far more than a mere search engine, but it's the uncluttered no-nonsense front page that was key to the site's initial success. Being one of the most comprehensive and relevant search tools around came later.

Project Lazarus should do just one thing then, and it should do it well. More than that, it should do it in such a way that its members never worry that their privacy is being compromised. Sadly, though, the way the net seems to be working at the moment, most of us would rather be dead than risk being spammed or tracked. Well, digitally dead, anyway.

**'Most of us would rather be digitally dead than risk being spammed or tracked online'**



# Reviews

EDITED BY MARK WALSH

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

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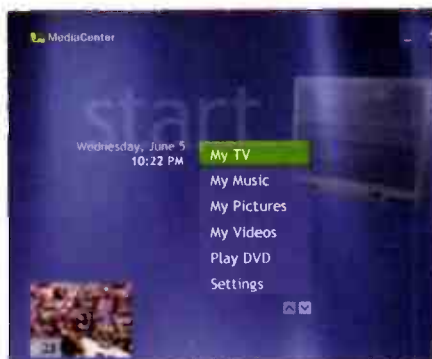
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### PAGE 64

Kodak has packed some advanced Oled screen  
technology into this affordable little snapper



### PAGE 76

The Tungsten W is a Palm PDA with built-in mobile  
and always-on GPRS - what more could you want?

It's been nine months since we first saw a Tablet PC. Despite good efforts from HP and NEC (see page 57) we're still waiting for it to really make an impact. However, Microsoft's other less hyped modification to Windows XP, the Media Center Edition (MCE), is receiving good press in the US, where it has been appearing in stores for some months. With the UK version being released this summer, we take a look at an MCE PC from the US to see whether it will persuade anyone here to take the leap into the digitally converged world.

In case you're not aware, the idea is to use XP's media-rich capabilities and the supplied remote control, to access multimedia content, especially TV, through a user-friendly access screen.

There are some issues to consider though. First, you can only get MCE when you buy a complete system - so far, Microsoft won't allow you to build your own. The real problem with this is the lack of style and finesse that current builders have used to make these systems - building your own using a compact, living room style box would give a better end result.

Companies such as Antec are making cases that closely resemble, in shape at least, consumer DVD players, so now is a good time to make your own. It's not as hard as it sounds: a good-looking case, some reasonably fast core components, a good remote, such as ATI's Remote Wonder (£30 from most good IT retailers), a few twists of a screwdriver and there you have it. What it may lack in class, it makes up for in looks and price.

Another option is Linksys' Digital Media Adapter. Simply a wireless kit with some digital media software and a remote control, the adapter lets you access all the multimedia content from your PC, wherever else in the house it may be, and play it into your living room television set - it really is as simple as that.

Also, the US-based BroadQ has produced a nifty little bit of software that allows you to do precisely the same, but using your Playstation 2 as the hub.

Finally, just as we went to press, MSI's Mega PC arrived in the offices. As you may have seen from our news coverage (see PCW June 2003, page 19), it closely resembles a traditional compact stereo, and hence could fit into your living room very inconspicuously.

Mark Walsh





### Toshiba Satellite

An impressive notebook with a graphics focus - see page 57



### Travelmate T400

NEC debuts its first Tablet PC - see page 57



## HIGH-END GRAPHICS CARD

# Nvidia Geforce FX 5900 Ultra

Nvidia proves that less is more, with this winning card for gamers



**N**vidia's latest few cards, all based around the processor codenamed NV30, have been repeatedly overshadowed by ATI. The first to emerge, the Geforce FX 5800, remains the most technically impressive card on the market. Its processor and memory clock both ran at 500MHz and - most importantly - it ran on DDR2 memory.

However, the heat produced by this high-specced beast meant that it was incredibly hot, even given the heavyweight fan that cooled it, and its results in our graphics tests weren't as legendary as Nvidia had hoped, or had led us to believe.

This latest Nvidia Geforce card, the FX 5900 Ultra, is the replacement for the 5800, and

is clearly a better performer, even with a weaker technical specification. First, the chip runs at 450MHz, but is the first to have a 256bit memory architecture - the 5800 was 128bit. Nvidia has chosen to revert to DDR1 memory, though it is clocked at a huge 425MHz. As this is double data rate memory, it's effectively 850MHz. The 5900 has also got a huge 256MB of memory - twice as much as its competitors.

Nvidia claims that the use of DDR2 memory was the primary cause of the heat produced by the 5800, which is why such an enormous fan was needed. By using DDR1 memory, the fan is far smaller, and the card should therefore be much quieter. In fact, when we tested, it seemed

no noisier than the previous card. It also produces far less heat, so it won't hurt your hand if you happen to touch it. Nvidia has stuck with four rendering pipelines too - ATI's 9800 uses eight.

The 5900 Ultra does require two back brackets though, so it prevents the use of the PCI slot below the AGP on your motherboard. However, it is unwise to use that slot anyway, as any card made in the last few years requires that amount of space to let air circulate.

As you can see from the performance graphs (below right) when running our standard tests, the 5900 Ultra performed a lot slower than ATI's main competitor, the Radeon 9800, in 3DMark 2001, but higher in Unreal Tournament.

We feared that Nvidia had again failed to regain its market leadership. However, our standard tests are run at a resolution of 1,024 x 768, without any filters, and anyone willing to spend £400 on a graphics card should be demanding far more.

And this is exactly what you get from the 5900. When run at higher settings, it gives the best results we've seen. Take the card

up to 1,600 x 1,200 and it's almost level with ATI's 9800 with a score of 11,830. Turn FSAA to four-speed and the Geforce 5900 scores 7,277, whereas the Radeon 9800 starts to fall behind with 7,057.

We then pushed the card further, using eight-speed FSAA, and anisotropic filtering and texture filtering. It managed 4,726 in 3DMark 2001 - significantly higher than anything else on the market. Also, the 5900 Ultra is the only card to score over 5,500 in 3DMark 2003, even running at 1,024 x 768 and without filters.

So, it's a comeback of sorts for Nvidia in its battle with ATI. The 5900 Ultra is the ideal card for the hardcore gamer, with our tests rating it as the fastest card on the market with filters and FSAA turned on.

However, its widespread appeal is very much limited by the exorbitant price: only the serious game addict should feel the need to buy something as heavyweight as this.

Mark Walsh

## DETAILS

**PRICE** £399 (£339.57 ex VAT)  
**CONTACT** Nvidia [www.nvidia.com](http://www.nvidia.com)  
**SPECIFICATIONS**

450MHz core • 256MB of DDR memory running at 425MHz • 256bit memory architecture • 27.2GB/sec memory bandwidth • DirectX 9 • OpenGL • AGP 4x/8x

**PROS** Great performance at high resolutions

**CONS** Cost

## VERDICT

**The fastest card on the market, but you'll have to fork out for it**

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

## PERFORMANCE





## SPRINGDALE PC

# Mesh Elite 3GHz Pro

Stacks of features and great graphics performance give this machine an expensive edge



**T**he second of Intel's 800MHz chipsets, codenamed Springdale, has been officially announced after a month's delay. This was coupled with issues over the reliability of the Pentium 4 chips that can accommodate the Front Side Bus (FSB) called Northwood C. All this bad press seems unwarranted, though, as the fault with the chips affected a tiny fraction of those that were manufactured.

This Mesh system includes one of two Springdale-based motherboards that we are reviewing this issue; the other can be seen in the motherboard roundup (see page 60).

The official name for the Springdale chipset is the 865. This is intended to be the mainstream chipset, and is therefore less performance orientated than the other 800MHz chipset, the 875, which we reviewed last month.

Nevertheless, this is incredibly powerful: there is support for AGP 8x graphics boards, Serial ATA hard disks and DDR 333MHz and 400MHz

DDR memory. Also included is Gigabit Ethernet as standard.

There are three versions of the board. The one included here, manufactured by Asus, uses the 865PE. This is the higher end of the boards, which includes support for 800MHz, 533MHz and 400MHz FSBs and dual-memory channels.

The second is the 865P, which is the low-end board. This does not support an 800MHz FSB and only supports DDR memory running at up to 333MHz. The final version is the 865G, which is the same as the 865P, but includes integrated graphics, called Intel Extreme Graphics.

The Mesh Elite 3GHz Pro uses two 256MB sticks of ultra-fast Corsair memory that runs at 400MHz. Given the technical specifications of both the 3GHz processor and the motherboard it sits on, performance is fast, achieving 294 points in Sysmark 2002, which is appropriate considering the chip, and that it is helped by the Maxtor 200GB hard disk, with its 8MB buffer and 7,200rpm spin speed. This disk does not use the

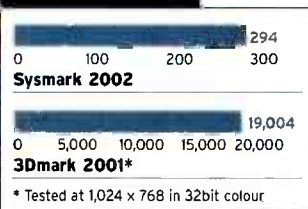
provided Serial ATA support, presumably because a traditional IDE channel gives a faster performance score.

Graphics performance is excellent, thanks to an ATI Radeon 9800 graphics card from Connect 3D. The Elite 3GHz Pro scored 19,004 in 3Dmark 2001 (the highest ever) and a huge 83.96 frames per second in Unreal Tournament 2003.

Mitsubishi's Diamond Plus 930 is an excellent monitor and perfect for showing off this excellent graphical power.

On the front of Mesh's spacious case are a Sony DVD writer drive as well as a Philips CD-RW/DVD combo drive. Both are fast, and the real advantage is that you could make direct disc-to-disc copies of DVDs.

### PERFORMANCE



The front of the case also houses two USB2 ports and there are four more at the back, as well as Firewire and coaxial S/PDIF ports on the motherboard.

Inside, there's an Audigy 2 Player card, which gives another Firewire port, but the extra bracket that houses the Midi/joystick port blocks one of the three free PCI slots. This card is coupled with Creative's Inspire 6700 speakers for 6.1 surround sound.

As well as Windows XP Home Edition, Mesh has included Works Suite 2003 – not the best choice of office packages, but perfectly good enough to start off with, and includes a full copy of Microsoft Word.

Despite its amazing credentials, this isn't the best PC we have reviewed this month; as Multivision's Ionix 3200+ earns that crown. However, there's no doubting this is an incredibly fast machine; the only thing to have doubts about before you make the purchase is whether you really require all these features and performance. That said, this would last you a very long time and rule out the need to upgrade a single component.

**Mark Walsh**

### DETAILS

**PRICE** £1,702.58 (£1,449 ex VAT)

**CONTACT** Mesh 0870 046 4747

**www.meshcomputers.com**

#### SPECIFICATIONS

3GHz Pentium 4 processor • 512MB of memory • 200GB hard disk • DVD writer • CD-RW/DVD drive • ATI Radeon 9800 graphics card • Mitsubishi Diamond Plus 930 monitor • Creative Audigy 2 Player • Creative Inspire 6700 • Windows XP Home Edition • 3yr on-site warranty  
**PROS** Speed; graphics  
**CONS** Price; bundled software

#### VERDICT

**Rather expensive, but still an excellent and future-proof system**

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

**AMD ATHLON PCs****Evesham Axis 3200+ and Multivision Ionix 3200+**

Two machines, both alike in specification, give gripping performances in this head-to-head



**H**ot on the heels of Intel's latest speed bump, AMD has released the next Athlon variant – the XP 3200+. Again, like Intel, the Front Side Bus (FSB) is what has taken the jump. AMD is lagging behind numerically though, as its jump is from 333MHz to 400MHz. Incidentally, the rest of the chip stays the same. Intel managed to double that, coming in at 800MHz, however, as every IT aficionado knows, size isn't everything – the chip still comes up with the goods, and at a much lower price.

The Athlon XP 3200+ runs at a brisk 2.2GHz. This may be fast, but it's still no patch on Intel's current flagship chip, the 3GHz, particularly considering a 3.2GHz was shown by Intel at Cebit in March. The two PCs here both come with the 3200+

sitting on Nforce2 motherboards, although they have different amounts of memory.

The Evesham system managed 274 on Sysmark 2002, which is 20 points or so behind the 3GHz Intel processors on Canterwood boards we saw last month. However, it's still very impressive for a chip running at just over two thirds the speed, although AMD's claim that it's equivalent to a 3.2GHz Pentium 4 may be a little over optimistic.

**Multivision Ionix 3200+**

Multivision's effort, running with a massive 1GB of memory, mustered up 264 in Sysmark 2002. Its ATI Radeon 9800 Pro graphics card gave it a huge 17,468 score in 3DMark, and 79 frames per second in the Unreal Tournament test – you really can't ask for more.

We've seen Multivision's black case before. Looking like something from the cult 1980s movie *Tron*, the blue light on the front may not be to some tastes, but it's definitely spacious inside, if untidily arranged.

Creative's Audigy 2 Platinum card fills a PCI slot, and its accompanying drive bay fills a 5.25in slot, right below those occupied by the NEC DVD writer and an MSI DVD-Rom drive. Creative's 6700 speakers are also supplied, as is a 56K modem, and Ethernet is built into the motherboard. There are also enough Firewire and USB2

ports for most users, with two of the latter on the front of the case.

Included in the low asking price is a 120GB hard disk and Multivision has used NEC's excellent 19in monitor, which conveniently comes in black. Its superb screen is the ideal accompaniment to the 3200+'s 3D performance and looks.

**Evesham Axis 3200+**

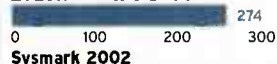
Evesham's offering comes in a far larger case, but is black too. Flip open the 5.25in drive bay lid at the front and you'll find that even the optical drives have been colour coordinated. The larger case also leaves room for

expansion in the 5.25in bays. The Evesham comes with less memory than the Multivision, but managed a curiously higher score in Sysmark 2002. This is likely to be down to the fact that Evesham has used DDR 400MHz memory, whereas Multivision has stuck with 333MHz. This may defeat the purpose of the FSB upgrade, but it makes quite a saving in cost.

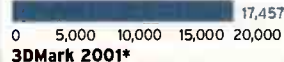
Besides this, there's very little to separate the two systems. Not surprisingly, the Evesham Axis 3200+'s Radeon 9800 Pro card gave very similar 3DMark and Unreal Tournament scores to Multivision's. The Evesham Axis also comes with a DVD writer and separate reader, as well as a Creative Audigy 2 Platinum card and 6700 speakers. The monitor is slightly better quality though.

But the real snag with the Evesham is that it is £250 more expensive than the Multivision, and that's before VAT. It is faster, granted, but only by a whisker, and has almost exactly the same features. The Multivision therefore easily deserves our Recommended award, while the Evesham is severely let down by its £1,800 asking price.

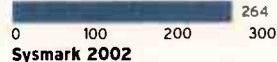
Mark Walsh

**PERFORMANCE****EVESHAM AXIS 3200+**

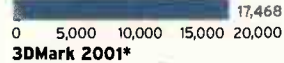
Sysmark 2002



3DMark 2001\*

**MULTIVISION IONIX 3200+**

Sysmark 2002



3DMark 2001\*

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

**DETAILS****EVESHAM AXIS 3200+**

**PRICE** £1,820.08 (£1,549 ex VAT)

**CONTACT** Evesham 0870 160 9530

[www.evesham.co.uk](http://www.evesham.co.uk)

**SPECIFICATIONS**

AMD Athlon XP 3200+ processor • 512MB memory • 120GB hard disk • DVD writer • DVD-Rom • ATI Radeon 9800 Pro graphics • NEC Diamond Plus 93 monitor • Creative Audigy 2 Platinum sound card • Creative Inspire 6700 speakers • Windows XP Home • Ability Office 2002 • Pinnacle Studio 8

**PROS** Speed; expandable

**CONS** Price

**VERDICT**

Well built and a great performer

– shame it's so expensive

**PERFORMANCE** ★★★★★

**FEATURES** ★★★★★

**VALUE FOR MONEY** ★★★★★

**OVERALL** ★★★★★

**DETAILS****MULTIVISION IONIX 3200+**

**PRICE** £1,526.33 (£1,299 ex VAT)

**CONTACT** Multivision

0870 220 2822

[www.multivision.co.uk](http://www.multivision.co.uk)

**SPECIFICATIONS**

AMD Athlon XP 3200+ processor • 1GB memory • 120GB hard disk • DVD writer • DVD-Rom • ATI Radeon 9800 Pro graphics • NEC Diamond Pro 930 monitor • Creative Audigy 2 Platinum sound card • Creative Inspire 6700 speakers • Windows XP Home • Lotus SmartSuite

**PROS** Fast performer; good value

**CONS** 333MHz DDR memory

**VERDICT**

Fast, well featured and affordable

**PERFORMANCE** ★★★★★

**FEATURES** ★★★★★

**VALUE FOR MONEY** ★★★★★

**OVERALL** ★★★★★



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- **OPERATING SYSTEM** Microsoft® Windows® XP Home • **MONITOR** 15" SXGA+ TFT colour display • **EXTRA SOFTWARE / HARDWARE** Cyberlink Studio, Symantec Norton Anti-Virus 2003, Ability Office, SIS645DX chipset motherboard, Optional external USB 3.5" 1.44MB floppy drive, ATI Mobility Radeon 9000 M9 64MB DDR graphics, 5.1 channel support & built-in dual stereo speakers, 1x PCMCIA Type II, 1x InfraRed port, 1x S-Video out port, 4x USB 2.0 ports & Firewire™, Internal 56K fax/data modem & 10/100 Ethernet, CD control panel & 5.1 sound, 12-Cell Li-ion battery & AC adaptor, 2 year hardware collect & return warranty • **EASY PAY PLAN FINANCE OPTION AVAILABLE**

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- **HARD DRIVE** 120GB 7200rpm • **DVD/CD-ROM** Systemax 16x DVD-ROM drive & Systemax 52x16x52 CD-RW drive • **MONITOR** 15.1" CTX LCD S500 • **GRAPHICS CARD** ATI All-in-wonder 9000 Pro AGP4X 64MB DDR VGA card with TV-Out / DVI Inc remote
- **SPEAKERS** Videologic ZXR-500 5.1 • **SOUND CARD** MSI S-Bracket for On-Board 6 channel digital sound • **EXTRA SOFTWARE / HARDWARE** Systemax 3.5" 6-in-1 media card reader, Psion WaveFinder digital radio, MSI 2-port Firewire card, Systemax wheel mouse, Systemax PS/2 keyboard with web hotkeys • **PLUS ALL STANDARD FEATURES**
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PART NO: BV70406

- **PROCESSOR** Intel® Pentium® 4 2.8GHz 800FSB Inc Hyper-Threading Technology
- **MOTHERBOARD** MSI 865PE NEO (Intel® 865PE) • **MEMORY** 512MB PC2700 333DDR
- **HARD DRIVE** 120GB 7200rpm • **DVD/CD-ROM** Sony DVD±RW drive
- **MONITOR** 17" CTX LCD S700 • **GRAPHICS CARD** NVIDIA® GeForce™ FX 5600 AGP8X 128MB DOR with TV-Out / DVI VGA card • **SPEAKERS** Videologic ZXR-500 5.1
- **SOUND CARD** Creative Sound Blaster® Audigy™ 2 6.1 Inc Firewire
- **EXTRA SOFTWARE / HARDWARE** Systemax 3.5" 6-in-1 media card reader, Hauppauge WinTV-Primio-FM TV-Tuner card, Systemax cordless keyboard & mouse
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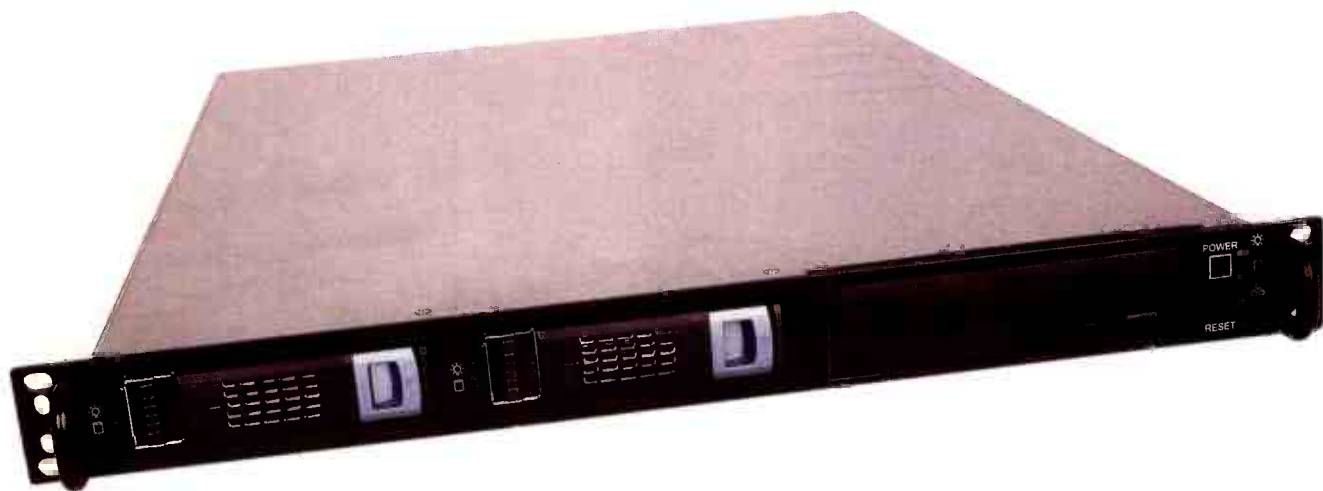
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## 64BIT SERVER

# Armari Optron 242

AMD's new 64bit processor gives a good opening performance



**A** new thread in the ongoing battle for processor supremacy between AMD and Intel starts here: a new type of AMD processor is upon us. Enter the Optron, marking AMD's first foray into the world of 64bit computing.

The Optron indicates a further move away from competing head-on with Intel. Aside from its esoteric Itanium chip, Intel is content to achieve faster processing by continually hiking clock speeds; it has no plans for a mainstream 64bit CPU. AMD has gone for brains over brawn, and Armari has sent us a development system to give us a taste of the new approach. Although the machine is rack-mounted, AMD isn't going to be limiting the Optron to the blue-chip server market. It's being pushed as a server processor and a basis for high-powered workstations.

As well as its true 64bit core, the Optron comprises 128KB of Level 1 and 1MB of Level 2 cache. The chip integrates a DDR memory controller, so the CPU is essentially directly connected to the memory, with the result that the concept of a front-side bus (FSB) and its attendant bottle-necking has been eliminated. All of AMD's 64bit products will be based around a Hypertransport

system bus, and the Optron has three Hypertransport links, allowing up to 19.2Gbytes/sec of system bandwidth.

At launch, there are three incarnations of the chip: the 240, 242 and 244. Note that these figures don't directly indicate clock speed, as AMD is trying to distance itself from the tenacious notion that this is the only indicator of a processor's performance. The first digit indicates scalability – the number of CPUs of that type that can be supported in a single machine. The 240, 242 and 244 all support up to two-way multiprocessing. The second two digits are essentially a coded clock speed figure. The 240 is a 1.4GHz part, the 242 runs at 1.6GHz and the 244 at 1.8GHz.

An advantage of the move to 64bit computing is the freedom from memory limitations – a 32bit processor can only ever access a maximum of 4GB of memory. The Optron, however, can address up to 256TB (terabytes). Intel tends to claim this is not a concern for most users, but it's certainly a big stumbling block for the likes of universities performing highly complex tasks such as climate modelling.

The system Armari sent us is a dual-processor 1U rack server sporting a pair of Optron 242s, sitting in 940pin sockets on an

MSI 9131 motherboard with dual-gigabit Ethernet adaptors. The chipset is AMD's 8000 series, specific to AMD's 64bit drive which, incidentally, is collectively known as AMD64. Four PC2700 Ram modules give the machine a total of 2GB main memory. It's also fitted with a pair of Maxtor Atlas 15K drives, spinning at 15,000rpm.

For the Optron to perform at its best, code needs recompiling for 64bit execution. But, as ever, the software is lagging behind the hardware and there is precious little 64bit code to test. AMD claims to have all bases covered though, and says the Optron is the fastest processor in its class for 32bit as well as 64bit code. The company has intimated that it considers an Optron 242 to be equivalent in performance to a 2.8GHz Intel Xeon when running 32bit code.

We'll hold fire on an official verdict on Optron until 64bit code is available, but our initial tests are encouraging. Pitting a dual-2.4GHz Xeon machine against it in our web server benchmarks saw the Optron holding its ground, returning an equal result.

Running component-specific CPU code, performing specialised floating-point arithmetic operation, had the Optron outstripping the Xeon by a considerable margin.

Although these tests aren't conclusive they do show that AMD has put its money where its mouth is, and has definitely whetted our appetite for the upcoming consumer-level 64bit processor, the Athlon 64. This will be essentially the same chip, but with one, rather than three, onboard Hypertransport links and varying amounts of Level 2 cache memory.

David Fearon

### DETAILS

**PRICE** £3,406.33 (£2,899 ex VAT)  
**CONTACT** Armari 020 8993 4111

[www.armari.co.uk](http://www.armari.co.uk)

#### SPECIFICATIONS

Dual Optron 242s running at 1.6GHz • 2GB PC2700 DDR memory • 36GB and 73GB 15,000rpm hard drives • Windows Server 2003 • United Linux • MSI 9131 motherboard • DVD-Rom • ATI Rage XL graphics • Dual Broadcom Extreme Gigabit networking • Adaptec AIC-7892 Ultra160 SCSI

**PROS** Runs 32bit code natively; initial tests indicate great potential  
**CONS** Needs 64bit code; initially more expensive than Xeon

#### VERDICT

**A great taste of things to come. Computing professionals should start evaluating it right away, but consumers need to wait a while for the Athlon 64**

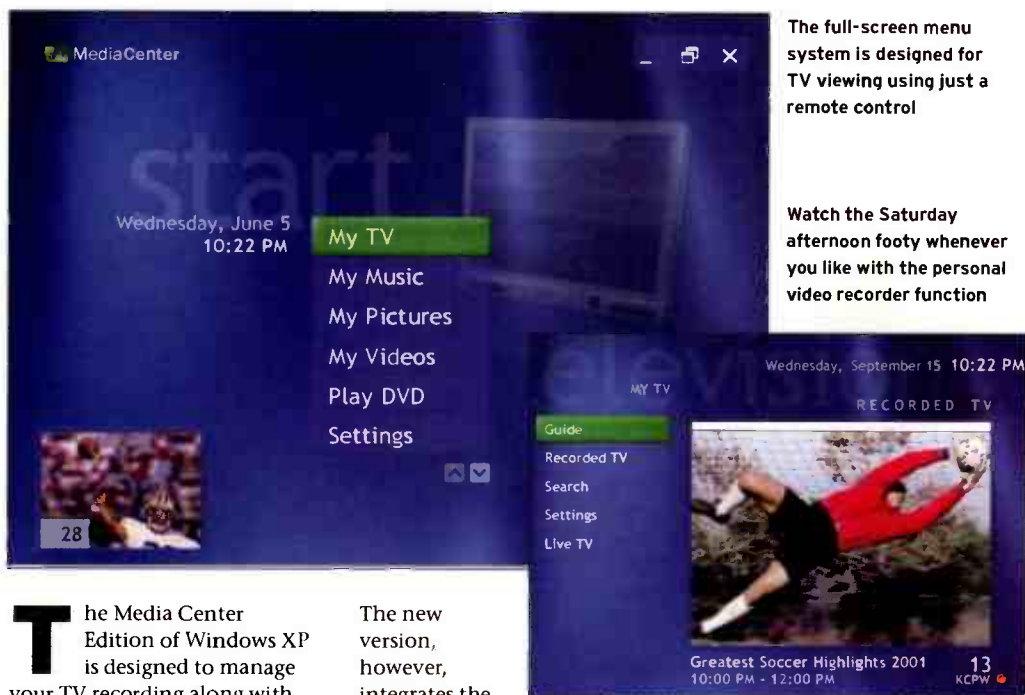
**PERFORMANCE** ★★★★★  
**FEATURES** ★★★★★  
**VALUE FOR MONEY** ★★★★★  
**OVERALL** ★★★★★

## PC ENTERTAINMENT SYSTEM

PREVIEW

# Microsoft XP Media Center Edition

The new face of Microsoft XP aims to put a computer inside the TV set in your living room



The full-screen menu system is designed for TV viewing using just a remote control

Watch the Saturday afternoon footy whenever you like with the personal video recorder function

**T**he Media Center Edition of Windows XP is designed to manage your TV recording along with radio, videos, DVDs, music and picture files. It's being sold in the US by OEMs using specially configured hardware, complete with a remote control. It's not certain if it will be released in the UK, but in our view it's only a matter of time before it is.

The new operating system, launched in the US last autumn, features the existing XP operating system with specialist audio-visual capabilities grafted on top. These facilities are operated via a remote control, which, when pressed, starts a separate Media Center program. From here, users can control everything via a full-screen menu system, making it possible to use the PC in a living room environment without the need of a keyboard and mouse.

Some of the features available in the Media Center program are little more than consumer-friendly versions of existing XP facilities. For example, it has been possible to store and view pictures intuitively in XP using the My Pictures folder, since the operating system was launched.

The new version, however, integrates the function into a menu that can be navigated using the remote control. It also includes a slideshow facility for viewing your images automatically on the big screen.

Similarly, the My Videos and My Music functions let you handle digital video clips and music as you'd handle them in the conventional XP operating system. The difference is that it lets you do it via a remote control with a consumer-friendly menu-driven front-end interface, rather than the traditional XP folder-driven GUI.

Other facilities in XP, such as multiple users, stay the same – you can program the system to create password-protected areas for different users. Then you can share your digital media by placing it in a shared folder, or simply keep it in your own folder for your own private viewing.

There's nothing wrong with doing conventional things in a more consumer-focused way, but the most interesting part of XP Media Center is the personal video recorder functions, as this is new to the product. When you first start up the system,

you must use the remote control provided by the hardware vendor to start Media Center, and then set up the product with the details of your TV service provider. As Media Center is linked to your set-top box, it can then download TV schedule details ready for you to set recording options.

Recording TV programmes using the built-in menu system looks simple and flexible. You can record a single programme or a series, and can also drill down to specify whether you want to record first-run programmes only, or first-runs and reruns. You can record by genre and get Media Center to search for programmes across all available channels.

If you like, you can even burn the programmes that you've recorded to DVD and play them on a conventional player. You can change the quality of the recording to suit your computer's available storage (recordings average between 1GB and 3GB per hour).

This is all contingent on you setting the correct service

provider details in the first place – you will find that it's easy to end up recording half of *Holidays from Hell* rather than the final episode of 24 that you were looking forward to, if you don't go through the initial steps properly.

There is a recording errors section designed to provide further details about any problems that occurred, but the recorder function tries to solve as many problems for you as it can automatically. It will do its best to resolve multi-channel recording conflicts using information such as whether the recording was set manually or automatically according to your selection criteria.

You can get back to a full-screen, live TV image from wherever you are in Media Center by pressing the Live TV button on the remote control. Again, this is in keeping with Microsoft's consumer-focused approach. The Media Center promises to be a useful asset for any high-tech household, although for many people the TV recording and easy-play DVD facilities will be the most valuable parts of the package.

Danny Bradbury

**DETAILS**

**PRICE** From \$1,400 (US only)

**CONTACT** Microsoft  
[www.microsoft.com/  
windowsxp/mediacenter](http://www.microsoft.com/windowsxp/mediacenter)

**SPECIFICATIONS**

2.5GHz Pentium 4 • 512MB memory  
• 120GB hard disk • DVD writer •  
Geforce 4MX 440 graphics card •  
56K modem • Ethernet connection

**PROS** Easy-to-use GUI; flexible  
video recording

**CONS** Current US marketing  
suggests you'll have to buy it  
as part of a hardware combo

**VERDICT**

Buy this if you're a TV and DVD  
buff when, or if, it comes to the  
UK. If you only want a regular  
PC, stick with 'vanilla' XP

<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>EASE OF USE</b>	★★★★★
<b>OVERALL</b>	★★★★★



## COMPACT PC

### Compaq Presario 6540

A feature-packed and stylish system



**H**P, using the Compaq brand, has bundled some decent core components in a feature-rich and compact box. Together with the similarly-styled TFT, the 6540 looks more suited to a living room than an office desk.

The AMD Athlon XP 2500+ processor, along with 512MB of memory, helped the 6540 reach an overall Sysmark 2001 score of 183. This isn't the best we've seen from this chip, but it's still acceptable for most tasks. There's also an 80GB hard disk, as well as a DVD writer and a separate DVD-Rom drive – very impressive considering the cost.

On the front, there are two USB2 ports and a Firewire, with two more Firewire ports on a PCI card at the back, along with four more USB2s on the MicroATX motherboard. The board also comes with serial and parallel ports, as well as wired Ethernet and three PCI slots, one of which is free. The AGP slot is filled by ATI's 64MB Radeon 9000. While this isn't the best card on the market, it's still

perfectly competent, managing 7,015 in 3DMark 2001 and 958 in 3DMark 2003.

The included 15in TFT screen is good quality, particularly for text, though irritatingly it's not height adjustable.

Sound is onboard, which is a disappointment, though not a surprise considering the PC's size. The keyboard and mouse are comfortable and the software bundle includes Works 7 and Norton Anti Virus 2003.

Cheap, reasonably fast and full of features, the 6540 is ideal for those not too concerned about graphics prowess.

Mark Walsh

#### DETAILS

**PRICE** £899 (£765 ex VAT)

**CONTACT** HP 0845 270 4222

[www.thenewhp.com/uk](http://www.thenewhp.com/uk)

#### SPECIFICATIONS

AMD Athlon XP 2500+ processor • 512MB of memory • 80GB hard disk • DVD writer (Plus format) • DVD-Rom • ATI Radeon 9000 graphics • Compaq 15in TFT • Ethernet • 56K modem • Windows XP • Works 7 • Norton Anti-Virus 2003 • 1yr RTB warranty

**PROS** Price; DVD-R; TFT screen

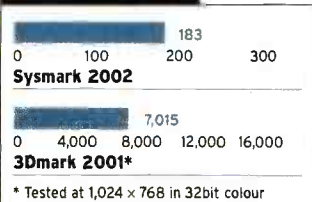
**CONS** Slightly weak performance

#### VERDICT

An excellent compact PC at a decent price - performance could have been better

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

#### PERFORMANCE



## BUDGET PC

### Systemax Inspire 3137

Good performance makes this a value PC



**S**ystemax continues to churn out good value budget PCs. For just over £700, the 3137 offers a 2500+ Athlon processor that runs at 1.83GHz – this rests on an MSI motherboard that uses an Nforce 2 chipset.

There are two 128MB sticks of memory, as well as Nvidia's Geforce FX 5200 Ultra graphics card. Sysmark performance was perfectly adequate, coming in at 208 overall. 3D performance was as expected for the graphics card, giving 9,317 in 3DMark 2001, 1,924 in 3DMark 2003 and 47fps (frames per second) in Unreal Tournament.

The low price has led to some deficits though. First, there's only one optical drive. Granted, it's a fast CD-RW and DVD combo, but we'd expect a second drive, even with the low price point. CTX's 17in monitor is a pretty poor choice as well, as the image is quite dull, and it's not the most aesthetically pleasing to look at.

On the plus side, the hard disk is a respectable 60GB, and

there's a plentiful array of ports. Two USB ports are on the front of the case and there are four more USB2s at the back. An Ethernet port is included on the motherboard, as well as serial, parallel and two PS/2 ports.

Included with the PC is Lexmark's X74, which is a low-end multi-function printer, and scanner that is fairly competent. The Inspire 3137 isn't the best budget system we've seen by Systemax, but if you've only got £700 to spend, you could do a lot worse.

Mark Walsh

#### DETAILS

**PRICE** £703.83 (£599 ex VAT)

**CONTACT** Simply 0870 297366

[www.systemax.co.uk](http://www.systemax.co.uk)

#### SPECIFICATIONS

AMD Athlon XP 2500+ processor • 256MB memory • 60GB hard disk • CD-RW/DVD drive • Nvidia Geforce FX 5200 Ultra graphics card • CTX E2700F 17in monitor • Onboard Nvidia six-channel sound • Lexmark X74 multi-function device • Windows XP Home Edition

**PROS** Performance; value

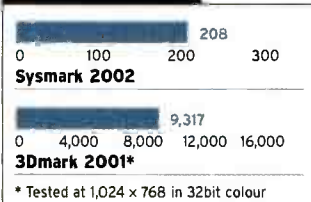
**CONS** Monitor

#### VERDICT

Although let down by the monitor and lack of second optical drive, this is a good value system

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

#### PERFORMANCE



**PENTIUM 4 NOTEBOOK****Toshiba Satellite 5200-902**

An impressive home notebook



**T**oshiba is the first manufacturer to release a notebook using the new Nvidia GeForce FX Go 5600 graphics chip, which means the Satellite 5200-902 is the first notebook we've seen to support DirectX 9 graphics.

The GeForce FX Go 5600 is effectively identical to the desktop GeForce FX5600 Ultra that we reviewed in our June issue. The core speed is 350MHz and the 64MB of dedicated DDR SD-Ram memory runs at an effective 700MHz.

However, performance is surprisingly poor, with a 3DMark 2001SE score of 6,938. That is very low compared to the 9,285 scored last month by the Dell Inspiron 8500, which uses the GeForce4 Go 4200. But that was a limited release, and available only through Dell. This 5600 is no match for ATI's Mobility Radeon 9000 though.

The Satellite 5200-902 comes loaded with Windows XP Home and Works Suite, so is clearly aimed at home users. Yet it has a full range of network

connections, thanks to the Intel Lan and Atheros mini PCI wireless Lan.

Sysmark performance is fast, and as much as we would expect for a 2.4GHz Pentium 4M with 512MB of DDR SD-Ram memory, while the 80GB hard drive is positively capacious.

This is a stylish, sophisticated notebook that even includes a DVD-Ram and DVD-R drive. It is rather hefty at 3.5kg and costs a steep £2,299, but we can hardly wait until Toshiba gets the graphics working at full speed.

Leo Waldoock

**DETAILS**

**PRICE** £2,299 (£1,956.60 ex VAT)  
**CONTACT** Toshiba 0870 444 8944

[www.toshiba.co.uk](http://www.toshiba.co.uk)

**SPECIFICATIONS**

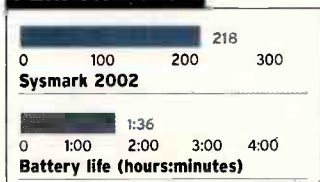
Intel Pentium 4M 2.4GHz • 512MB DDR SD-Ram • Intel 845M chipset • 80GB hard disk • Matsushita dual-speed DVD-R • Nvidia GeForce FX Go • 15in TFT screen • Windows XP Home • Microsoft Works Suite • 330 x 310 x 42mm (w x d x h) • 3.5kg • 1yr RTB warranty

**PROS** Fast; looks; DirectX 9; DVD-R  
**CONS** Expensive; heavy; disappointing 3D performance

**VERDICT**

We were very impressed by the Satellite 5200-902, but a little bemused by the poor graphics performance

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

**PERFORMANCE****TABLET PC****NEC Travelmate T400**

Successful first Tablet PC from NEC



**W**e haven't seen a Tablet PC in quite a long time – none since the four that were announced at its launch, in fact. This is NEC's first stab at a Tablet PC, and on first looks they've done a great job.

Using a Mobile Pentium III processor that runs at 933MHz, it's no speed demon. However, considering the purpose of a Tablet PC is to function as a large, feature-rich PDA, this is fast enough and livelier than most of the competition. The T400 has 256MB of memory and a 20GB hard disk. It also has a 10.4in XGA TFT screen, a single speaker to the rear, as well as three USB ports (though the included, external 24-speed CD-RW takes up one of them), PC Card slot, and wired and wireless Ethernet. The latter uses a rather flimsy aerial on the left-hand side to enhance its range. Next to it is a VGA port and the wired Ethernet connection. There's a simple on/off switch for the 802.11 connection, which is compatible with both a and b.

It's the lightest Tablet PC so far at 1kg, and is therefore the first to feel like a truly portable device. However, it's still pretty large and still not something we'd feel comfortable carrying like a notepad. It also gets quite warm after an hour's use, though not too hot to touch.

The stylus is quite small – more like something you would find on a PDA – so it will be comfortable for users familiar with this style. However, with the screen active, it still leads to difficulties in handwriting recognition, though this is more a fault with the operating system's requirements than NEC's. Battery life is quoted at four hours, which is fair.

The T400 is quite expensive too, at more than £1,500 (inc VAT). However, it is the most comfortable Tablet PC we have seen, which goes a long way to warranting the high cost.

Mark Walsh

**DETAILS**

**PRICE** £1,526.33 (£1,299 ex VAT, delivery £45)

**CONTACT** NEC 0870 010 6322  
[www.nec.co.uk](http://www.nec.co.uk)

**SPECIFICATIONS**

933MHz Pentium III-M processor • 256MB memory • 20GB hard disk • 24-speed external CD-RW • 10.4in XGA TFT screen • Windows XP Tablet Edition • 1kg • 1yr RTB warranty

**PROS** comfortable to use;

well featured

**CONS** Price

**VERDICT**

Despite the high cost, this is a well designed Tablet

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





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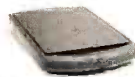
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E-CODE: AX1113-07

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- 2x120GB Serial ATA hard drive with 8MB buffer
- 128MB DDR ATI Radeon 9800 Pro graphics with TV-out & DVI
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- 16x DVD-ROM drive
- DVD MultiWrite drive
- 10/100 network connection (on-board)
- v92 56k Internet ready modem
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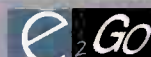
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RAM	256MB	512MB	512MB	512MB
Hard Drive	<del>20GB</del> 30GB	40GB	60GB	60GB
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Graphics	64MB VGA nVIDIA GeForce4	64MB VGA nVIDIA GeForce4	64MB VGA nVIDIA GeForce4	64MB VGA nVIDIA GeForce4
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## 800MHZ MOTHERBOARDS

# Gigabyte, Intel & MSI motherboards

Three very different high-end boards on test



**M**anufacturers are gearing themselves up to launch new motherboards based on Intel's latest chipsets, the 875 (Canterwood) and the 865 (Springdale). The first boards we have seen using any of these chipsets are two 875P boards – a reference board from Intel, one from Gigabyte, plus an 865G board from MSI.

### Gigabyte GA-8KNXP Ultra

The first board we looked at was Gigabyte's GA-8KNXP Ultra, part of its Pentium 4 Titan series. On opening the box it's amazing anyone managed to shut it in the first place – not only is the board packed with features, but the box is crammed with extras.

It's hard to find anywhere on the board that hasn't got a chip or capacitor built on it. In addition to the features supplied by the chipset – integrated Serial ATA, serial ATA Raid, USB2 and Lan – there is a separate two-channel ATA133/100 Raid which supports Raid 0, Raid 1 or Raid 0, plus Raid 1 and two SCSI Ultra 320 ports. These support

Raid 0 and Raid 1, controlled by an Adaptec AIC-7902W chip, so no matter how many drives you have, or what sort they are, the board has a port or two for them.

The board features Gigabyte's Dual Bios set-up and Dual Power System 2 (DPS2) daughter card which uses a six-phase power circuit design, offering support for the next generation of Intel processors.

To back up the processor, the GA-8KNXP Ultra has six Dimm slots that can accept a maximum of 4GB of either DDR400 or DDR333 memory.

Inside the box is everything you need to get you started. There's a full set of IDE cables, floppy cable, two serial ATA cables and an extraordinary long rounded SCSI cable. You also get three brackets, two with two USB2 ports each and an S/PDIF bracket, driver CD, Raid manual and a colour poster to help you set up the board.

The GA-8KNXP Ultra performs fantastically, but not as fast as the preceding Intel board, getting 311 in Sysmark. It's very expensive though, but then with two of the latest SCSI

320 ports on board it was never going to be cheap. Fill it with memory, add a SCSI Raid set up and the GA-8KNXP Ultra forms the basis of a very powerful workstation.

### Intel D875PBZ

The Intel D875PBZ reference board we received is almost exactly the same as the retail board. The only things that appeared to be missing were the audio ports, although the solder points were on the board, and one or two extra headers, including extra USB and front panel connectors. Even with these missing items the board is well laid out, with plenty of space between all the components. Not having a CNR or AMR slot helps, as the AGP slot and the five PCI slots can be dropped down the board, so there is none of the usual obstruction of the memory slot latches by the graphics card.

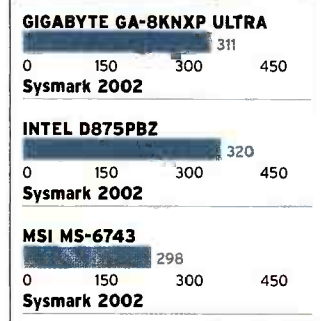
All the IDE ports and the ATX power supply connector are neatly located on the right-hand edge, with the auxiliary 12v connector positioned just under the CPU heatsink cradle. Although there are no IDE Raid

ports, the chipset has built-in serial ATA Raid support for the two serial connectors.

One thing that immediately stood out was the stacking of the USB2 ports. Two were stacked on top of the Lan port as normal, but the other four were stacked on top of each other. It remains to be seen if this configuration will make it to any retail boards. The other thing that grabs the attention is the massive, passive heatsink that cools the 875P Northbridge.

The rest of the board is standard stuff, with five PCI slots, an 8x AGP slot and two serial ports. Its Sysmark result certainly stood out though, as

### PERFORMANCE



the highest we've ever seen. If you're after a no nonsense powerhouse of a board, this is the one to go for.

### MSI MS-6743

MSI's MS-6743 uses Intel's 865G chipset, the G is the version of the 865 (Springdale), with the latest version of Intel's Extreme graphics version 2, and is built on a well laid out micro ATX form factor PCB.

Performance is weaker than the two 875 boards, but still very high at 298. The graphics chip is pretty disappointing though, earning just 2671 in 3DMark 2001, and a dismal 60 in 3DMark 2003. That said, it's still perfectly competent for playing a DVD, so this board could be suitable as a set top box PC.

As well as internal graphics, The 865G also supports all versions of the Pentium 4, from the earlier 400MHz and 533MHz FSB processors up to the latest 800MHz CPUs. The chipset's integrated features allow powerful motherboards to be built on small platforms.

Because of the chipset's features, this small motherboard packs a lot into a small space. There are four USB2 ports on board, integrated Lan, two serial ATA ports and four Dimm slots. You also get a Firewire port.

Unfortunately, the small form factor means space for expansion slots is rather limited, but MSI still manages to squeeze in three PCI slots and a single CNR slot. In addition to the integrated graphics, there is also a 8x AGP slot.

Even though the board is small it doesn't appear to be overly cluttered. The only clash of components is the usual one – because of the closeness of the Dimm slots to the AGP slot, the memory latches are obscured, which means that the graphics card has to be taken out to change the memory. This is hardly a chore, but it can be a pain never the less.

The board we looked at didn't come in a retail box, but if recent MSI boards are anything to go by, this one will have a lot bundled with it. As it is, our sample came with two serial ATA cables and a floppy and IDE cable.

Simon Crisp

#### DETAILS

##### GIGABYTE GA-8KNXP ULTRA

**PRICE** £310.20 (£264 ex VAT)

**CONTACT** Gigabyte

[www.gigabyte.com.tw](http://www.gigabyte.com.tw)

##### SPECIFICATIONS

Pentium 4 (800/533MHz FSB) • Intel 875P chipset • Six memory slots • AGP 2x/4x/8x • Six-channel audio • 5 PCI slots • 2 parallel ports • 2 ATA133 parallel Raid slots • 2 serial ATA slots • 2 Scsi slots • 8 USB2 • 2 PS/2 • 2 serial • 1 parallel port

**PROS** Excellent support of Raid

in various configurations

**CONS** Very expensive

##### VERDICT

Very pricey, but incredibly feature rich

##### PERFORMANCE

★★★★★

##### FEATURES

★★★★★

##### VALUE FOR MONEY

★★★★★

##### OVERALL

★★★★★

##### INTEL D875PBZ

**PRICE** £135 (£114.89 ex VAT)

**CONTACT** Intel

[www.intel.com](http://www.intel.com)

##### SPECIFICATIONS

Pentium 4 (800/533MHz FSB) compatible • Intel 875P chipset • 4 memory slots • AGP 2x/4x/8x • six-channel audio • 5 PCI slots • 2 parallel slots • 2 serial ATA slots • 6 USB2 • 2 PS/2 • Serial and parallel port • Integrated Ethernet

**PROS** Layout

**CONS** Quite expensive

##### VERDICT

Practically a retail board with just one or two omissions. Offers an idea of just how feature rich the basic 875 chipset can be

##### PERFORMANCE

★★★★★

##### FEATURES

★★★★★

##### VALUE FOR MONEY

★★★★★

##### OVERALL

★★★★★

##### MSI MS-6743

**PRICE** £97 (£82.55 ex VAT)

**CONTACT** Systemax

0870 727 6000

[www.systemax.co.uk](http://www.systemax.co.uk)

##### SPECIFICATIONS

Pentium 4 (800/533/400 MHz FSB) • Intel 865G chipset • 4 memory slots • AGP 2x/4x/8x • Integrated IEG2 graphics • Integrated six-channel audio • 3 PCI slots • 1 CNR slot • 2 parallel slots • 2 serial ATA slots • 4 USB2 • 1 Firewire • 2 PS/2 • 1 serial port • 1 parallel port • Ethernet

**PROS** Good board for smaller cases

**CONS** Limited expansion

##### VERDICT

If you are looking for a powerful, well-featured motherboard to fit in a small case, take a close look at this MSI board

##### PERFORMANCE

★★★★★

##### FEATURES

★★★★★

##### VALUE FOR MONEY

★★★★★

##### OVERALL

★★★★★

#### 3G VIDEOPHONE

## NEC E606

An impressive new mobile concept



The next step for mobile phones is 3G – the faster data speeds it offers will herald a world of video calls and mobile, broadband Internet access. Three is the first company to build a 3G network, and the NEC E606 is the first handset that people can buy.

Despite having had years to work on the technology, Three hadn't been able to get the mobile, broadband access working when we tested. Those hoping to download their email and browse the web at improved speeds will have to wait.

Instead, Three has focused on largely frivolous services targeted at the affluent consumer. You can download highlights of Premiership football matches (between 50p and £1 a pop), play games and use Three's location-based service to find local restaurants (10p a go), but you can't currently stream video – each clip has to be downloaded before it can be played.

Video calling is impressive when it works. You'll need to call someone that's similarly equipped with a Three phone and is sitting somewhere among the 50 per cent of the population that has 3G coverage. The image is jerkier and more pixelated than the TV adverts suggest, but you can work out what is going on – video calls cost 50p per minute. If you wander outside of Three's coverage, the phone

automatically roams onto O2's 2G network.

The handset is thicker than your average 2G mobile, though not as brick-like as the Motorola A830. Unfortunately, the NEC is difficult to use, with one of the worst interfaces we've seen. Although the phone has a Bluetooth chip, it doesn't work with headsets and can't connect to computers. You can transfer files to your PC via a USB cable, but it is a fiddly process.

John Collins

#### DETAILS

**PRICE** £199 (£169.36 ex VAT) with

contract (until end of May 2003)

**CONTACT** Three 08707 330 333

[www.three.co.uk](http://www.three.co.uk)

##### SPECIFICATIONS

Dual mode 3G and 2G • 65,535-colour TFT LCD screen with 132 × 162 pixels • Two built-in cameras • 32MB memory • Bluetooth • Battery life: standby 41 hours; talk time 121 minutes; video call 63 minutes • 150g • 53 × 32 × 109mm (w × d × h) • 1yr warranty

**PROS** Proves video calls can work

**CONS** Poor interface; expensive; lack of fast data access

##### VERDICT

Interesting proof of concept, but buyers should hold off until the hardware gets better, Three's network supports fast data connections and the price drops

##### PERFORMANCE

★★★★★

##### FEATURES

★★★★★

##### VALUE FOR MONEY

★★★★★

##### OVERALL

★★★★★



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Typical example 36 monthly technology business plan at

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E-VALUE Code: 001 I01b

#### Recommended Upgrade Offer<sup>1</sup>

- Add an additional 256MB £100 ex VAT
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- Microsoft® Works 7.0
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incl. Del. & VAT

Typical example 36 monthly technology business plan at

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incl. Del. & VAT\*

E-VALUE Code: 001 I08

#### Recommended Upgrade Offer<sup>1</sup>

- Upgrade to 8xDVD/24x CD-Rewriter £50 ex VAT
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- Upgrade to 3 Years' International On-site Next Business Day<sup>2</sup> Service £199 ex VAT



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Typical example 36 monthly technology business plan at

**£44.43 PM**

incl. Del. & VAT\*

E-VALUE Code: 001 I05

#### Recommended Upgrade Offer<sup>1</sup>

- Upgrade to 8xDVD/24x CD-Rewriter £50 ex VAT
- Upgrade to a 40GB Hard Drive £45 ex VAT
- Upgrade to 3 Years' International On-site Next Business Day<sup>2</sup> Service £199 ex VAT

Award Dell Inspiron 8500, Editor's Choice  
www.zdnet.co.uk, March 2003

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## 5MEGAPIXEL CAMERA

### Pentax Optio 550

Compact camera with plenty of power



**T**he 550 is an attractive, 5megapixel, compact camera. It's not the most lightweight affair, but as a result feels sturdy and comfortable.

It comes with a 5x optical zoom which, along with the megapixel rating, sets it apart from the similarly sized and priced Olympus C-50 Zoom that only offers 3x.

The 550 offers plenty of resolution options ranging from 2,592 x 1,944 down to VGA. On its highest settings, the pictures are crisp and clear. Colours were surprisingly well graded, though on the whole it's not quite on a par with other 5megapixel models, and the movie mode seemed a little jerky.

It's comfortable to hold, though it could do with an indent for your thumb on the right-hand side. The control dial at the top is well laid out and the nine picture options can produce some interesting effects. It also includes a panoramic mode so you can stitch shots together.

Under manual control, there are eight white balance settings and ISO speeds up to 400. Aperture ranges from f2.8 to f4.6 at full zoom. The digital filter allows you to add sepia or black and white effects.

The movie mode can take up to 10 minutes of footage, though this is obviously dependent on memory card

size. We were therefore very disappointed with the 16MB SD memory card supplied with the camera, particularly as the 550 can produce very high resolution images.

All modes can record wav format sounds, allowing voice labels for images as well as for movies. The 1.5in LCD is clear and bright, but slightly slow to refresh.

The Optio 550 is incredibly well featured for a compact camera, but it is fairly expensive – be sure you need its high resolution and features before shelling out.

Jananie Nadarajah

#### DETAILS

**PRICE** £549.99 (£453.74 ex VAT)

**CONTACT** Pentax 01753 792 762

[www.pentax.co.uk](http://www.pentax.co.uk)

#### SPECIFICATIONS

5megapixel resolution • 5x optical zoom • 4x digital zoom • 37.5-187.5mm focal length (35mm equivalent) • automatic, on, off and red-eye flash modes • 1.5in LCD • 16MB SD card • 250g • 100 x 40 x 59 mm (w x d x h)

**PROS** Compact; well featured

**CONS** Quite heavy

#### VERDICT

**A high-end camera squeezed into a compact box, the 550 is impressive, but may not suit everyone's needs**

<b>PERFORMANCE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

## OLED CAMERA

### Kodak LS633

Good price, great display, but poor images



**W**ith a 3.1megapixel resolution and 3x optical zoom, the LS633 is quite chunky compared to its Easyshare LS stablemates. This is purely due to the screen at the back, which uses Oled technology to provide a clearer, more defined image.

Oled screens differ from LCDs because each pixel generates its own light, while the shades of light in an LCD are blocked by the liquid crystal. This means the light from Oleds give a stronger image.

The LS633 uses a 2.2in screen, which is nearly an inch bigger than most compact cameras, particularly in this price range. The real advantages of using an Oled screen are its tremendous viewing angle, quoted at 165 degrees, and the fact that it can be seen clearly in direct sunlight – something that plagues the LCDs on most digital cameras. The end result is a very clear and bright image, though we found the refresh rate was a little sluggish – though that is no surprise with a new technology.

Like most Kodaks, the LS633 is very easy to use. All modes are selected through the dial at the back, and all the options can be surfed using the incumbent joystick. The LS633 has 16MB of internal memory, and can accommodate SD cards.

Image quality is, however, somewhat disappointing, looking rather compressed, and there's very little gradation in colours, particularly greys.

The Easyshare LS633 can be connected to a Kodak cradle for simple image transfer, but it also has video and USB ports. Considering the dock costs an extra £60, many may not deem it worthwhile.

But despite reservations over the quality of the images, Kodak should be commended for combining good features and excellent new technology within the £300 price barrier.

Mark Walsh

#### DETAILS

**PRICE** £299 (£254.27 ex VAT)

**CONTACT** Kodak 0870 243 0270

[www.kodak.co.uk](http://www.kodak.co.uk)

#### SPECIFICATIONS

3.1megapixel resolution • 3x optical zoom • 3.3x digital zoom • 37-111mm focal length (35mm equivalent) • Automatic, fill, red-eye and off flash modes • 2.2in Oled • 16MB internal memory • SD/MMC slot • 114 x 31 x 55mm (w x d x h)

**PROS** Screen; ease of use

**CONS** Image quality

#### VERDICT

**Comfortable, affordable and with a great screen, the LS633 is let down by its image quality**

<b>PERFORMANCE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

**DIGITAL CAMERA**

## Olympus Camedia C-350 Zoom

Well specified 3.2megapixel digital camera



**T**he 3.2megapixel C-350 Zoom is a smart little snapper encased in a sculpted, frosted silver case. The integrated lens cover slides back to power up the unit and allow the lens to pop out ready for use.

At the back of the unit, a large 1.8in LCD, which is bright, if a little grainy, allows you to frame your composition, and there is also a regular viewfinder. These controls are similar to those found on the C-220 Zoom featured in last issue's group test. The button marked 'OK' calls up the straightforward onscreen menu, which is navigated using the four cursor buttons that double up to give fast access to macro, flash and self timer modes. There is also a 'quickview' button to review your images.

Image quality and resolution are combined to give four options selected via the menu: super high quality or high quality at 2,048 x 1,536 resolution, down to 640 x 480. There is also a selection of scene modes including portrait and panorama. Handily, the bundled software will stitch the panoramic shots together when you download your images.

The self-portrait mode is a zoom preset calculated according to the average size of a person's head and the length of their arm to give you the optimal frame for your shot. In use, the depth of field turned

out to be very shallow, so you're likely to lose detail in the background of your picture.

Image quality was generally good, especially in macro mode where the C-350 captured sharp detail right into the corners of the image. In auto mode, though, the corners of the image tended to be blurry and the camera had trouble capturing areas of extreme highlight. Colours, on the other hand, were faithfully rendered and lifelike, and the C-350 Zoom differentiated well between areas of similar tone.

Emilie Martin

**DETAILS**

**PRICE** £249.99 (£212.76 ex VAT)  
**CONTACT** Olympus 0800 072 0070  
[www.olympus.co.uk](http://www.olympus.co.uk)  
**SPECIFICATIONS**

3.2megapixel resolution • 3x optical • 3.3x digital zoom • 35-105mm focal length (35mm equivalent) • On, off, auto, red-eye reduction flash modes • 1.8in LCD • 16MB XD-Picture card • 170g • 108 x 40 x 57.5mm • USB cable • 1yr warranty

**PROS** Lovely to use; smooth zoom; large LCD

**CONS** Rechargeable battery not included

**VERDICT**

**A reasonably-priced, versatile camera with a good range of features to play with**

<b>PERFORMANCE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

**BUDGET DIGITAL CAMERA**

## Sipix Style Cam Groove

Affordable digital camera for fun snaps



**A**s digital cameras are relatively pricey pieces of kit, you'd be forgiven for resorting to a cheap 35mm snapper to take pictures at parties, in the pub or on the beach, where the risk of damaging your camera is relatively high. Now, though, with digital camera manufacturers such as Sipix releasing products like the £50 Style Cam Groove, your digital camera need never leave your side again.

The camera is built around a 1.3megapixel Cmos sensor, but uses interpolation to achieve simulated 2megapixel images and offers video capture, audio recording and web cam options, in addition to taking the more traditional still shots.

The unit itself is tiny and feels flimsy until you slot in the two AA batteries that power the unit. At this price there is no zoom or LCD so all shots must be framed using the viewfinder. A basic calculator style screen at the back of the unit displays a list of camera modes and image settings, which must be scrolled through one at a time with multiple clicks of the power/mode button. There is a separate button to scroll through the basic flash modes.

With 16MB of internal memory, the Sipix can store only nine 1,600 x 1,200 pixel images, but up to 155 at its

lowest resolution, so naturally it yielded the kind of image quality you'd expect from a £50 camera. Our shots were grainy, the outlines of objects were indistinct and colours were washed out. Areas of highlight tended to be burnt-out and areas of shadow were very noisy.

At this price, this is only to be expected, but the unreliability of the bundled software was more of a concern. On several occasions we could not persuade our PCs to recognise the Style Cam Groove at all, which made downloading our images something of a challenge.

Emilie Martin

**DETAILS**

**PRICE** £50 (£42.55 ex VAT)  
**CONTACT** Jessops 0800 652 6400  
[www.jessops.com](http://www.jessops.com)  
**SPECIFICATIONS**

1.3megapixels • 43mm focal length (35mm equivalent) • auto/off flash modes • 16MB SD-Ram internal memory • 63g • 90 x 24 x 60mm • USB cable • 2yr warranty

**PROS** Price; portability

**CONS** Unreliable software; poor image quality

**VERDICT**

**A fun camera better suited to capturing atmosphere rather than detail**

<b>PERFORMANCE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## 15IN FLAT PANEL

### ADI Microscan I500

A touch of style at an affordable price



If you've ever felt peeved that Mac users seem to get all the good designs, then the ADI Microscan I500 may help sate your appetite for a stylish workstation.

The 15in TFT LCD area, which has a native resolution of 1,024 × 768, is encased in an ultra-thin, brushed aluminum bezel that matches the square panel forming the front of the base of the unit. There are two speakers housed in this panel which gave surprisingly good audio quality for their size.

All the controls on this monitor are tiny. You'll find four buttons controlling the audio settings on the right-hand side of the base, including mute, volume up, volume down, and a fourth button that allows you to activate the SNS Wow and Trubass audio enhancement options. On the left-hand side, as you face the unit, you'll find two USB2 ports with a further two at the rear of the base.

The section of the monitor that houses the screen is mounted on the base by means of a piston-like metallic arm that allows you to adjust the height of the screen, which can also be tilted and swivelled.

On the underside of the bezel, a power button sits next to three buttons that allow you to navigate the onscreen menu (OSM), which is easy enough to use and is divided into 10

submenus, each represented by an icon with an accompanying text label. In the colour settings menu you can change colour temperature and red, green and blue settings, each of which have a sliding scale and numerical value assigned.

Picture quality was generally good, although colours were a little washed out even on the auto colour setting, and skintones had a pink tinge. Screens of solid colour were uniform right into the corners of the screen, but there was some distinct banding in areas of tonal graduation.

Emilie Martin

#### DETAILS

**PRICE** £270.25 (£230 ex VAT)

**CONTACT** ADI [www.adi.com.tw](http://www.adi.com.tw)

#### SPECIFICATIONS

15in screen • 1,024 × 768 native resolution • TFT active matrix LCD • VGA input • 250cd/m2 brightness • 400:1 contrast ratio • 100-degree vertical/120-degree horizontal viewing angle • 3.5kg • 156.5 × 345.6 × 334mm

**PROS** Design; price; USB2; good speakers

**CONS** No DVI input

#### VERDICT

An above average panel, with a stylish case at a good price

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

## LCD PROJECTOR

### SHARP PG-A10S

Quiet and bright, with a hefty price tag



A projector can be both a useful tool for business presentations, and a fabulous toy for big kids who want to watch movies on the wall on their living room. The new Sharp PG-A10S LCD projector comes in two forms; we reviewed the 800 × 600 VGA resolution model, while the PG-A10X model, which costs £1,835 ex VAT, has a higher XGA resolution. You can push the PG-A10S to a non-native resolution of 1,024 × 768, but the picture definition suffers a little.

The PG-A10S has a rated brightness of 1,500 lumens and a noise level of 35dB in standard mode. If you switch to eco-mode the brightness drops to 1,200 lumens and the noise drops to 31dB. Running in eco-mode the lamp life increases to up to 3,000 hours.

Our initial impression of the projector was very mixed as the keystone adjustment is fairly poor. Straight lines were either jagged or wavy, and looked anything but straight, but dropping the projector near to the horizontal worked wonders and the picture looked very good.

We tested the projector with the lights on and were impressed by how well it performed. Colour presentation was warm and accurate, but it is hard to distinguish between very dark shades that were near to black.

Sharp has included a remote control and the PG-A10S can be ceiling mounted, but we really don't see that would be practical with the keystone adjustment issue, unless the screen was angled appropriately.

On the other hand, it works well as a home entertainment projector, and the quiet operation is a real bonus. The problem is that you would have to spend over £1,600 of your own cash, which makes it an expensive luxury.

Leo Waldoock

#### DETAILS

**PRICE** £1,639.13 (£1,395 ex VAT)

**CONTACT** Sharp 0800 138 8879

[www.sharp.co.uk](http://www.sharp.co.uk)

#### SPECIFICATIONS

1,500 lumens • 165W lamp power • 400:1 contrast ratio • 800 × 600 native resolution • VGA, S-Video, RCA composite video, audio inputs, RS232 output • remote control • 2.9kg • 297 × 89 × 229mm (w × h × d) • 3yr RTB warranty

**PROS** Colour; quiet; bright

**CONS** Expensive; poor keystone control

#### VERDICT

A decent LCD projector, limited by its resolution and poor keystone control. We also feel it is rather expensive

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

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## PDA

### Palm Zire 71

Feature-packed, fast and colour to boot



**T**he first Palm Zire, released last summer, was a bit of a disappointment. It may have been cheap, at just £100, but it had a black and white screen and was slow and rather unsightly. The Zire 71 may look very similar, but technically it's a completely different proposition. At £250 it's not much less than what you'd expect to pay for a Tungsten T, but you get a lot for your money.

First, it uses Palm OS 5 and has a 144MHz Arm processor. It's capable of mp3 and mpeg playback, with headphone socket at the top, and it has a surprisingly good speaker. The 320 x 320 resolution screen is fabulous – very similar, if not identical, to the Tungsten T, and while perfectly suited to video, text is still beyond reproach.

The Zire 71 also comes with a VGA digital camera that you slide out like you would a Nokia phone. The capture button is at the bottom and the lens at the top. You can use 13MB of the flash memory to store images, but you can expand this by using the SD card slot. Picture quality is better than you'd expect, and the quality of the screen helps show these images off in the slide show function.

The four shortcut buttons are rather small, but the joystick-style five way navigation button is very simple to use.

One thing we were disappointed with was the introduction of Graffiti 2. While some may find the Pocket PC-isms of this version of Graffiti an improvement, we found them very irritating – to type a 'T' for instance now takes a vertical then a horizontal stroke, while an apostrophe appears when entering the '7', like the shape of yore.

The Zire's only real rival is Sony's Clie NX-70, which is twice the size, £100 more, slightly better featured but harder to use. If multimedia is important, the Zire 71 is very likely the one for you.

Mark Walsh

#### DETAILS

**PRICE** £249 (£211.91 ex VAT)

**CONTACT** Palm [www.palm.com/uk](http://www.palm.com/uk)

#### SPECIFICATIONS

Palm OS 5 • 144MHz Arm processor • 16MB Flash Rom • 3.5in screen at 320 x 320 resolution • SD slot • Infra-red • 640 x 480 resolution camera • 150g • 74 x 17 x 114mm (w x d x h) • USB connection

**PROS** So many features; fast  
**CONS** Graffiti 2 is very confusing

#### VERDICT

**Not the best looking, but the Zire 71 is one of the most feature-packed, best value for money PDAs on the market**

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

## MONO LASER PRINTER

### Lexmark E323n

Network printing at an affordable price



**E**ncased in distinctive black, the Lexmark E323n is an affordable network mono laser intended for small workgroups. It's not packed with every trick in the book, but it could hit the right note if you're looking for all the basics.

The paper trays are akin to those found on most inkjet printers. The main input tray towards the back holds 150 sheets – a very inkjet-like capacity in itself – while a single-sheet manual feeder is located just in front of it. In front of these two is another extendable lean-back tray, this time for the printouts. It's also possible to open a flap at the front of the machine for face-up output, but it's best reserved for single sheets or card, for which a straighter paper path may be necessary.

In addition to the Ethernet port, the E323n's network features include DHCP support for automatic configuration. If your network doesn't enjoy the luxury of DHCP, IP addresses are easy to set up remotely from any connected PC using the Printer Setup Utility provided.

Helpfully, the printer drivers can converse with the Markvision software provided, to assist with usage reports and account tracking. This is the kind of feature you'd only expect from a printer costing twice as much.

The printer is fast enough for everyday work. In our tests, we achieved 18ppm for plain text output, which is close enough to the quoted 20ppm.

Print quality is good, if not quite the best we have seen, but you should consider upgrading the memory in the device if you plan on printing lots of graphics. Similarly, while a 150-sheet input tray isn't a problem for personal printers, a busy workgroup might be advised to invest in the 250-sheet optional feeder.

Alistair Dabbs

#### DETAILS

**PRICE** £433.58 (£369 ex VAT)

**CONTACT** Lexmark  
08704 440 044

[www.lexmark.co.uk](http://www.lexmark.co.uk)

#### SPECIFICATIONS

150-sheet input tray, single-sheet manual • 20ppm • 600 x 600dpi • Combined toner and imaging drum kit • 16MB memory • USB, Ethernet • 9kg • 391 x 361 x 221mm (w x d x h) • £72.51 (£61.71 ex VAT) standard toner, £101.44 (£86.33 ex VAT) high capacity

**PROS** Good value; network setup

**CONS** Low paper capacity; needs more memory

#### VERDICT

**Should give your workgroup just what it needs in performance, without busting your budget**

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

# MONEY



With its fast printing and outstanding colour quality,  
you'd expect the Phaser 8200 to cost a bundle.

**There's a new way to look at things.**

The Phaser 8200 delivers super-rich colour in super-fast time. At 16 full colour pages per minute, it's 4 times faster than traditional colour laser printers. And with an industry-leading first page out time of just 9 seconds, you're likely to be finished before most other printers have even started. It's also very easy to install, load, use and



manage. The solid ink technology features drop in ink sticks, which can be topped up at any time without any wastage. Powered by a 300 MHz PowerPC processor and with true Adobe PostScript 3, the Phaser 8200 really does deliver a whole lot more. And with prices starting at just €1,810\* you'll get it for a great deal less. Call 0870 241 3245 or visit [www.xerox.com/officeprinting/mon](http://www.xerox.com/officeprinting/mon)

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\*List price for Phaser 8200II configuration. Price quoted was correct at time of publication but may be subject to change. Reseller prices may vary.



## DVD WRITERS

# DVD writers compared

DVD-RW drives get faster and cheaper every day. We put 12 through their paces

It is 20 years since Philips and Sony developed the Compact Disc (CD) format. While the CD is an exceptionally valuable media for data sharing and storage, in the world of storage more is always better, and the single gaping flaw with a CD was the inability to cram a complete movie on to it while retaining decent picture quality. The amount of space required for a movie varies, but it generally needs 3GB or 4GB, and there was simply no way to stretch the CD format that far. So the digital versatile disc, that is DVD, was born.

The real problem for DVD is that there are three competing formats around. The first is known as the Minus (DVD-) format, and consists of a write once format called -R, which first appeared in 1997, and its rewritable counterpart, -RW. The Minus format is mainly backed by Panasonic and Pioneer.

By contrast, the competing Plus (DVD+) format is supported by Sony, Philips, Hewlett-Packard, Ricoh, Dell and Yamaha. The rewritable +RW format came along in late 2001, and was followed by the +R format in mid-2002.

Finally, to complicate matters further, there's DVD-Ram. This still uses a disc as the media, but unlike either DVD- or DVD+ the drive can read and write to the disc simultaneously. That makes it behave in a similar way to a hard drive or, indeed, to memory, hence the name.

The basic unit of DVD capacity is 4.7GB, which can hold about 133 minutes of mpeg2 movie. There are also single-sided, double-layered discs where a transparent disc is very precisely glued on to the bottom disc. The laser in the player alters its focus to read either the top or bottom disc and it has a capacity of 8.5GB. DVDs can also be double-sided, so a double-sided, single-layer DVD has a capacity of 9.4GB, while the biggest of them all – the double-sided, double-layered DVD – holds 17GB.

We gathered together 12 DVD writers to see which was the best value for money. The testing procedure was very simple – each drive was tested with a 3GB mixed data file on all the media types that the drive could handle. The time it took to burn the data and verify the procedure was then timed (see page 73 for the complete results). Each drive was tested on a 2GHz Pentium 4 with 512MB of memory and an 80GB hard disk – the Lacie and Sony DRX-500UL external drive was tested using a PCI USB2 card.

### Aopen DVRW2412Pro

The Aopen DVRW2412Pro highlights one of the major differences between the Plus and Minus formats. It is rated at 2.4-speed for both +R and +RW media, and in our performance graph for write speeds it sits in the lower half of the group. This is because all the four-speed Plus drives have the legs on it. When

it comes to RW it is a completely different story, as the +RW format has a clear performance advantage over the -RW format. This places the Aopen near the top of the pile, although there is very little to choose between the top six drives in that test.

The performance advantage is primarily because a +RW drive formats a section of the media and then starts writing on it immediately, rather than waiting for the whole disc to be prepared. But there is another reason too. Minus drives often write a full lead-out, much like the data used to identify a closed session when burning a CD. It can, therefore, take the same amount of time to write a small amount of data as it would to write large amounts.

The CD-RW part of the Aopen is the fastest in this round up by a fair margin. While this does not justify the purchase alone, this may be the appropriate choice if you do not have a separate CD-RW drive. The supplied software is very impressive, including Ulead's excellent video-editing software and Nero 5. There's little else in the way of extras here though, so there's no real justification for the high price tag.

### Asus DRW-0402P

This is a curious drive that is practically two machines merged into one. The DRW-0402P has a disappointingly slow 8x/8x/32x CD-RW drive, coupled with a Minus format DVD writer rated at four-speed for writing

and two-speed on rewrite. It's an impressively fast drive when it comes to -R media, coming top of the group in our writing test, even if it was by only a few seconds.

That advantage was lost in our combined RW test as a -RW drive simply can't stand up to the +RW contestants, and the Asus was beaten by a number of the other -RW drives too. It even lost out to single-speed drives such as the Panasonic, even when we applied the very latest drivers.

We were unimpressed by the software package that Asus has chosen. In its defence, though, it does supply everything that you need. The best part is Nero Burning Rom and the Asus DVD player is much like any other package, but we found the user interface on Cyberlink Power Director was awkward to use. The software works just fine, but it just didn't compare well to some of the other contenders. For instance, we found the B's DVD software was far more intuitive to use.

### HP DVD300i

HP offers this drive for sale in two forms. We tested the DVD300i, which is an internal drive costing £234, but there is also an external DVD300e for £299, with USB2 and Firewire ports. In theory, both drives should have very similar performance, though the use of an external connection may hamper performance slightly (see the Lacie review opposite). The DVD300i stormed through our tests, and

**Aopen DVRW2412Pro:** An expensive option with good all-round rewriting

**Asus DRW-0402P:** Almost two different machines merged into one

**HP DVD300i:** Stormed through our tests, but has a high price tag

**Lacie external D2 drive:** A sluggish performance failed to impress





**NEC Multispin ND-1100:** A champ of a drive gets our stamp of approval



**Panasonic LF-D521E:** Sluggish drive that supports Minus and DVD-Ram



**Pioneer DVR-A05:** Little reward for an hour chugging away at a rewrite

acquitted itself very well indeed.

In addition to superb DVD performance, the HP has good CD-RW speeds and a well-rounded software package, which is to be commended. Although none of the software packages are written by HP, the CD integrates them neatly together, which is much as we would expect from HP. However, while this is very impressive, it doesn't come close to justifying the high price tag of the drive – the extra £49 over the NEC Multispin is too much to ask for a few extra frills.

## Lacie D2

Lacie makes solely external drives, and the D2 follows on from previous CD-RW models by including Firewire and USB2 ports, as well as the appropriate cables. Those interfaces are fast enough to make the drive perform well, but our performance tests show that just isn't the case.

Part of the blame for the poor result in our RW test can be laid at the door of the Minus format used by Lacie, but the write test result was also disappointing. The real let down was the 11-minute prepare time before the burning started. Even given the potential sluggishness of the USB2 interface, we suspect that software may also be at fault. Curiously, this is the only drive that used Roxio Easy CD Creator software, which required an

update from the Roxio website to add support for DVD burning.

Whatever the exact cause of the problem, the Lacie took its time and failed to impress.

## LG GMA-4020B

This is the first of our hybrid DVD writers. The LG GMA-4020B is a regular Minus format DVD drive that also supports DVD-Ram.

This is a curious technology that is not only suited to data storage, but also to domestic DVD recorders that are used as digital video recorders, as the technology can perform the neat trick of time shifting. That means you can start recording the program you want to watch, then see it from the beginning while it is still recording the rest of the show. When you get to an advert break, or a dull part, simply press the fast forward, and if you manage to catch up to the live TV then all well and good.

While this is impressive, the same thing can still be done using a hard drive, and the appropriate software can be found packaged with any ATI All-in-Wonder graphics card. Therefore, data storage is its only real practical use on the PC.

In that light, the rest of the LG GMA-4020B drive isn't very impressive, as the performance scores show. It loses out to its only competitor in the Ram tests, the Panasonic

drive, while coming near bottom in both write and re-write tests.

LG has balanced that shortfall with a low price point and a decent software package from B's, so if you're looking for a drive that you can leave overnight to back-up your vital data, this may be the one.

## NEC Multispin ND-1100

NEC has achieved exactly what we hoped for when the first DVD writers were released – when they were slow, clunky and expensive.

The Multispin ND-1100 is relatively fast (although we will doubtless laugh at that statement in a year's time) and cheap at £185 – it also works very well indeed.

The ND-1100 uses the Plus format, and comes towards the top of the league on both our tests. It also comes with a good collection of software, all of which works without any real hassle.

While we'd love to find fault with it, we couldn't even carp over the CD writer, which is decent enough, so we gave up. It's a really good product, no more no less. If you're after a DVD writer, this is the one to go for.

## Panasonic LF-D521E

Our second DVD-Ram drive is essentially identical to the LG GMA-4020B, with the exception of the software package and

manual. Oh, and a price tag the wrong side of £200. The two drives perform much the same, with the Panasonic having an edge. Leaving all that aside, Panasonic supplies a fairly comprehensive software package that is truly intended to make your life just about as easy as possible.

It also supplies media like every other vendor here, including a piece of DVD-Ram in a caddy which costs about £20 retail.

Despite that, we are unable to recommend the Panasonic, as it is essentially a slow, expensive Minus format drive that also does DVD-Ram.

## Pioneer DVR-A05

On paper, the Pioneer DVR-A05 promises a decent match for the Asus, but in reality it's just not like that.

The Pioneer does fairly well in our write test, although it is around 14 per cent slower than the Asus, but when we came to our rewrite test something terrible happened. The Pioneer was last – behind even the DVD-Ram drives – and took over an hour to complete the tests.

While Asus helped itself by supplying the fastest media of any drive in this group, it is clear that the Pioneer was suffering for some reason.

We know that media compatibility can be a big

**Plextor PX-504A:** First effort is a good performer but a bit too pricey

**Ricoh MP5125A-DP:** A good rival for the NEC but needs a speed boost

**Sony DRU-500A:** Great performer supports Plus and Minus formats

**LG GMA-4020B:** A hybrid drive at a low-price could fulfil back-up needs





concern, so we used the media supplied by each manufacturer and also had a stack of Sony media to hand. We chose Sony as it sells R and RW media in both Plus and Minus formats.

Unfortunately, the Pioneer did not respond to our ministrations and the results speak for themselves.

To add insult to injury the Pioneer is also very expensive, so even if a magic firmware update cured the speed problem we would be unable to recommend this drive.

In its defence, it does come with the rather excellent MyDVD from Sonic, but this is not enough to save it.

## Plextor PX-504A

This is the first DVD writer that Plextor has released, and for a first effort it's rather good. Using the Plus format, it performed very well in our speed tests and there were no nasty surprises in

store. The software package is comprehensive, if unexciting, and the four CDs are packaged in a neat gatefold wallet, including a copy of Pinnacle Studio for editing movies.

On the downside, it is slightly overpriced, as you could get the multi-format Sony drive for only £9 more. Giving similar performance and offering the same features for £50 less is the NEC drive, which receives our Recommended award, while the Plextor sadly pales into insignificance.

## Ricoh MP5125A-DP

The Ricoh MP5125A-DP is very similar to our winning NEC – with one notable exception. It only writes to +R media at 2.4-speed rather than at four-speed, and that is borne out by the test results.

The two drives perform within a very impressive ace of each other in the rewrite test,

but in the write test the Ricoh falls a considerable distance behind the NEC.

This is exactly as we would expect, and it wouldn't be a problem had there been a hefty saving to compensate for the deficiency in speed. It's not that the Ricoh is expensive, just that the NEC is, quite frankly, better.

Ricoh includes a small stack of both CD and DVD media which, while handy, isn't particularly impressive. Given that the NEC and Ricoh have such a similar price tag and a near-identical software package we opt for the NEC on the basis of performance. If Ricoh engineers come up with a speed boost in the near future, that may all change.

## Sony DRU-500A & 500UL

The DRU-500A is the only DVD writer in this test to cater for both Plus and Minus formats,

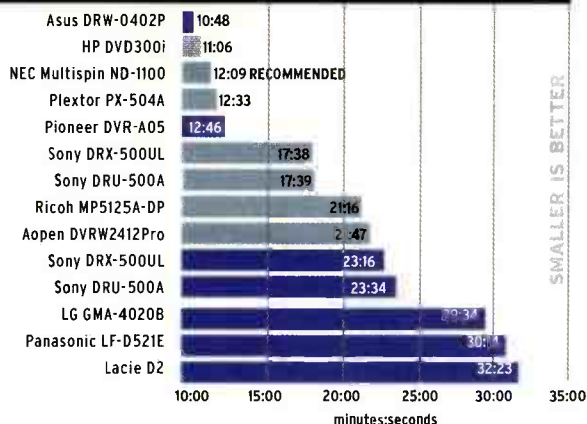
so the performance graphs may look a little confusing at first sight (there are separate results for the two formats). This inevitably makes it the most expensive internal drive on test, but the performance in either format is perfectly adequate, and this was the fastest rewrite drive, even if it was only by a four-second margin. The Sony is also available as an external USB2 model, the DRX-500UL, which retails for £376, which is a stack of cash by any standards.

If you're happy to stick to one format then we whole-heartedly recommend the Plus format NEC. However, if you are likely to send DVDs to a variety of people and are unsure what sort of hardware they own, you may well find that the dual-format capability is worth having. That is particularly true of small businesses that prepare videos or send out photos on DVD. There are few things as embarrassing

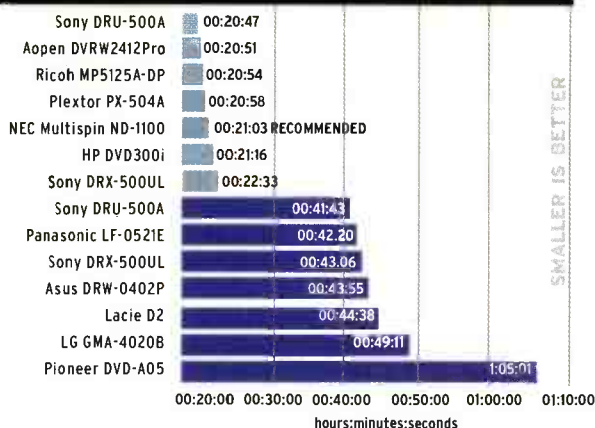
## Details

MANUFACTURER	AOPEN	ASUS	HP	LACIE	LG
PRODUCT	DVRW2412PRO	DRW-0402P	DVD300i	D2 (EXTERNAL)	GMA-4020B
Price	£226 (€192)	£192 (€163)	£234 (€199)	£304 (€259)	£178 (€151)
Telephone	0073 645 9516	01908 518 000	0870 5474 747	020 7872 8000	0870 607 5544
URL	<a href="http://www.aopen.nl">www.aopen.nl</a>	<a href="http://www.asus.com">www.asus.com</a>	<a href="http://www.hp.co.uk">www.hp.co.uk</a>	<a href="http://www.lacie.com">www.lacie.com</a>	<a href="http://www.lge.co.uk">www.lge.co.uk</a>
Interface	Atapi	Atapi	Atapi	USB2, Firewire	Atapi
Digital Audio/Analog Audio	✓/✓	x/✓	x/✓	x/x	x/✓
SPEEDS					
DVD-R	N/A	4	N/A	2	2
DVD+R	2.4	N/A	4	N/A	N/A
DVD-RW	N/A	2	N/A	1	1
DVD+RW	2.4	N/A	2.4	N/A	N/A
DVD-Ram	N/A	N/A	N/A	N/A	2
DVD-Rom	8	12	8	6	10
CD-R/CD-RW/CD-Rom	32/10/32	8/8/32	16/10/40	8/4/24	12/8/32
SOFTWARE					
Mastering software	Ahead Nero 5	Ahead Nero 5	Veritas Record Now	DVDit LE 2.5.3	B's Recorder Gold 5
Packet writing software	InCD 3	InCD 3	Veritas DLA	Sonic MyDVD Video	B's Clip
Video editing/authoring software	Videostudio 6	Power Director	Arcsoft Showbiz	MyDVD Video Suite	B's DVD
DVD player software	PowerDVD XP4	Asus DVD	PowerDVD	WinDVD 4	WinDVD 4
Other	NeoDVD standard	Media@show SE	Simple Backup	Easy CD Creator 5.3	None
VERDICT					
Pros	Very fast writing to +RW; fast CD-RW	Fastest of all in our R media test	Very fast; software package	PC and Mac compatible	DVD-Ram & -R; cheap; software
Cons	Average writing to +R; expensive	Slow CD writing; software package	Rather expensive	Very slow; fairly expensive	Slow, particularly at RW
Overall	Performs well, but is overpriced	Moderately priced DVD writer, but the CD writing is too slow	Well performing and with plenty of software, but very pricey	A sluggish DVD writer	If you need DVD-Ram, buy the Panasonic
SCORES					
Performance	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

## DVD write speeds: time to record 3GB of data



## DVD rewrite speeds: time to record 3GB of data



as sending a disc to a client that appears to be blank when they try to play it.

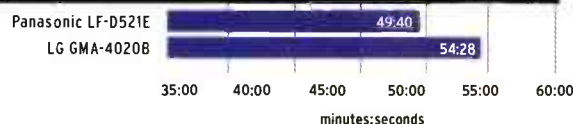
### The verdict

DVD writing has nearly come of age and is now easy and relatively cheap. The NEC drive, which receives a Recommended award, is an effective product

that has very few frills, yet offers all the features that we require and good performance. No doubt speeds will continue to rise and prices to fall, just as they did with CD-RW drives, but with prices this low there is no need to wait before you dive into the world of DVD burning.

Leo Waldoock

## DVD Ram speeds: time to record 3GB of data



Key: Plus format (grey bar) Minus format (blue bar)



NEC	PANASONIC	PIONEER	PLEXTOR	RICOH	SONY
MULTISPIN ND-1100	LF-D521E	DVR-A05	PX-504A	MP5125A-DP	DRU-500A/DRX-500UL
£185 (£157)	£202 (£172)	£240 (£204)	£238 (£203)	£178 (£151)	Int: £247 (£210) Ext: £376 (£320)
0870 0106 3225	0870 535 7357	01753 789789	00 32 2725 5522	00 31 20547 4111	0870 5111 999
<a href="http://www.nec.co.uk">www.nec.co.uk</a>	<a href="http://www.panasonic.co.uk">www.panasonic.co.uk</a>	<a href="http://www.pioneer.co.uk">www.pioneer.co.uk</a>	<a href="http://www.plextor.be">www.plextor.be</a>	<a href="http://www.ricohpmc.com">www.ricohpmc.com</a>	<a href="http://www.sony.co.uk">www.sony.co.uk</a>
Atapi	Atapi	Atapi	Atapi	Atapi	Atapi
✓/✓	x/✓	x/✓	✓/✓	✓/✓	x/✓
N/A	2	4	N/A	N/A	4
4	N/A	N/A	4	2.4	2.4
N/A	1	2	N/A	N/A	2
2.4	N/A	N/A	2.4	2.4	2.4
N/A	2	N/A	N/A	N/A	N/A
12	12	12	12	8	8
16/10/40	12/8/32	16/8/32	16/10/40	12/10/32	24/10/32
Ahead Nero v5	B's Recorder Gold 5	Instant Disk	Ahead Nero 5	Ahead Nero 5	Veritas Recordnow
InCD 3	B's Clip	Instant Write	InCD 3	InCD 3	Veritas DLA
Arcsoft Showbiz	B's DVD	Instant Video	Pinnacle Studio	NeoDVD, Winproducer	Sonic MyDVD, Arcsoft Showbiz
Sonic MyDVD	Sonic MyDVD, WinDVD	Sonic MyDVD	PowerDVD XP4	WinDVD Standard	PowerDVD XP4
ActoPC Nero Vision Express	Filesafe, DVD-Movie AlbumSE 3	Instant Backup, Music & Drive	Plextools	None	Veritas Simple Backup, Music Match
Fast performance; cheap	DVD-Ram burning	Software	Fast; software	Price, performance	Both Plus and Minus formats; fast
Not that many features	Slow; overpriced	Slow rewrite performance	Expensive	Very few features	Price
It's a winner	Expensive, but may be suitable for small business data storage	Expensive, so very hard to recommend	It doesn't stand out from the crowd	A good value drive	A highly desirable DVD writer
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★



## MONO LASER PRINTER

### HP Laserjet 2300dtn

All you need from a workgroup printer



**J**ust adding a network connection to an A4 mono laser won't be enough for the most demanding workgroups, so HP has designed the Laserjet 2300dtn to be the ideal top-spec printer for the workgroup that wants it all.

The main printer unit, containing a 250-sheet cassette and 100-sheet multipurpose feeder, sits on top of a 500-sheet bin base, giving you a capacity of 850 sheets. By default, output drops face down into the top tray, but a flap opens at the back to allow printouts to be delivered face up, also acting as a straight paper path from the multipurpose feeder. A duplexing unit is built inside for two-sided printing.

A large, backlit LCD status window gives real messages and allows easy navigation of the printer menus. Thanks to the machine's embedded web server, you can change printer settings, monitor usage and check consumables remotely using a web browser. HP's Jetdirect 615n EIO printer server is built in, so the job queue is processed by the printer itself. All port connections – USB, parallel and Ethernet – are protected behind a large plastic cover on the right in order to minimise the risk of cables being knocked out by accident. Network setup is simple thanks to HP's Network Installation Wizard.

In our tests, we managed to print 21 copies of a plain text file within a minute, which isn't too far off the official 24 pages per minute rating. Print quality is good, producing unbanded gradients and crisp text right down to 4pt without breaking up. Printing with PCL 5 and 6 ran perfectly, as did Postscript 3 jobs, despite being emulated rather than the real deal from Adobe. Our only complaint was the odour coming from the top of the unit when in use.

Alistair Dabbs

#### DETAILS

**PRICE** £915 (£778.72 ex VAT)  
**CONTACT** HP 08705 474 747  
[www.hp.co.uk](http://www.hp.co.uk)

#### SPECIFICATIONS

Mono laser • 250-sheet and 500-sheet input cassettes, 100-sheet MP tray • 24ppm • 1,200 × 1,200dpi • 48MB memory • USB, parallel, 10/100BaseTx Ethernet • 18.9kg • 412.8 × 450 × 397.2mm (w × d × h) • Toner/drum cartridge life: 6,000 sheets (five per cent usage) • £117.57 per cartridge

**PROS** Easy setup

**CONS** Price

**VERDICT**

The Laserjet 2300dtn gives you capacity, flexibility, speed and quality – at a reasonable price

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

## MONO LASER PRINTER

### HP Laserjet 1150

Low-res alternative for text-heavy printing



**T**he HP Laserjet 1150 looks almost identical to the Laserjet 1200 that we reviewed in the April 2003 issue group test.

It has the same 250-sheet capacity paper input tray that slots into the front of the system, with a frosted plastic cover that doubles as a manual paper feed, and a 125-sheet capacity output tray that is sunk into the top of the unit.

A second output slot at the back of the printer simplifies the paper path of awkward media and is exposed by pulling down the fold-down flap.

The case of the 1150 is totally devoid of buttons – the only display on offer is a jelly-bean shaped LED on the left-hand side of the casing. Next to this are two smaller sidekicks that blink in different sequences to communicate different status and error messages. A fold-down flap at the front of the printer exposes the interior of the machine and simultaneously extracts the cartridge from the guts of the unit as you open it, making cartridge removal and installation simple.

The 1150 is faster than the 1200 (April PCW, p179), with a quoted print speed of 17 pages per minute (ppm) – a speed that the printer achieved in all our tests, apart from the test photo, which it printed at 3ppm compared to the 1200's 14ppm.

On the other hand, resolution is not as good at 600 × 600dpi, against the 1200's 1,200 × 1,200 resolution.

Output quality was generally good though. The 1150 produced solid characters with smooth outlines from 72pt down to 4pt, and these were on a par with those produced by the 1200. Characters at 2pt were less easy to read and the real difference in the resolution of the two units became evident in our 10-page pdf test where icons and areas of shading were very grainy.

Emilie Martin

#### DETAILS

**PRICE** £229 (£194.89 ex VAT)  
**CONTACT** HP 08705 474 474  
[www.hp-expo.com/uk/eng](http://www.hp-expo.com/uk/eng)

#### SPECIFICATIONS

Mono laser • 250-sheet input/125-sheet output tray capacity • 17ppm quoted printing speed • 600 × 600dpi • Single cartridge • 8MB memory • USB2, parallel • 8.5kg • 415 × 486 × 241mm • Cartridge cost: £54.58, estimated life 250 pages

**PROS** Speed; plain character rendition; good software interface

**CONS** Maximum resolution

**VERDICT**

High speed printing, but low resolution makes this ideal for text-heavy usage

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

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## WIRELESS PDA

# Palm Tungsten W

A versatile PDA with built-in phone, offers fast Internet access and email, but no browser

**P**alm's Tungsten W was announced last year, but it's taken this long for the product to appear in the UK, and as we went to press a service provider hadn't been confirmed.

It's remarkably similar to Handspring's Treo 270, featuring a colour screen GSM/GPRS telephone and a thumb operated keypad. Unlike the Tungsten T and the Zire 71, it's not an OS 5 device with a fast processor, relying instead on the older Palm OS 4.1 and a 33MHz chip. And unlike the Treo, there's no built-in microphone and speaker for the telephone functions – you have to use an earpiece, which some may find awkward.

The set-up procedure, as with all Palm OS devices, is simple and straightforward. A Sim card is inserted in the back, and most network details can be downloaded from this, though you need to set up GPRS details in the Connections Preferences, and Wap details in the browser preferences. Palm envisages selling the W via mobile networks, which will do all this for you, though once we worked out where the different settings were, it wasn't too hard to do. One grumble we had is that the Sim carrier seems flimsy, and a couple of times the Tungsten W lost contact with our card.

The two right-hand buttons on the bottom change from their usual functions for the W, with the inner becoming mail and the outer launching the Wap browser or, when held down, acting as an on/off switch for the phone module.

There's no instant access button for the phone dialling application, but you can use the five-way navigator key in the address book to select an entry quickly with one hand. Press right and you see a list of numbers and email addresses; mobile numbers appear twice, once for calls and once for SMS.

Scroll to the appropriate line, select it, and you're instantly composing an email, texting with SMS or at the dial screen.

In the phone, you can choose profiles, which determine ring tones, vibration settings and call divert – but you can't have different rings for different callers. There are some other minor niggles too. If you receive an SMS with a phone number in it, you have to highlight the number with the stylus, select copy, then paste it into the dial box in the phone app to call it – that's just too long winded.

On the plus side, there's support for Sim Toolkit information menus, which Orange subscribers will be

used to – though if you have the phone loaded with apps, you might have to do a lot of clicking to find the app for the function you want.

But there's one big omission – a web browser. Since the phone has GPRS and a good colour screen – though not as good as some – it seems odd to omit a browser. You'll have to download one yourself, and though there are a few to try – some free – it should really be in the box.

The email app, Versamail, is a re-badged Multimap, which Palm bought a few years ago. It can support multiple email accounts and attachments, and it manages Imap as well as POP3, which makes it a much better bet

for people on the road – though you can't access all your remote Imap folders, unfortunately. For the rest, the Tungsten W is a competent PalmOS PDA, performing pretty much as you'd expect, although with the omission of Graffiti. There's a copy of Jot on the CD, so you can use that to enable handwriting or use Graffiti or the keypad if you prefer. The latter is workable with two thumbs, but it's probably very much a matter of personal preference which one you opt for. It would be good, though, if the number keys – which sit on the top Qwerty line – were automatically enabled in the phone app, instead of requiring the shift key to be pressed.

All in all, a competent PDA, whose fate will be decided by the price the networks put on it. For email on the move, it's a great tool, but we don't think it's such a wonderful replacement for a mobile phone. And we wish it came with PalmOS 5 and a more modern processor, and, of course, a web browser.

Nigel Whitfield



## DETAILS

**PRICE** £300 approx (depending on mobile contract)

**CONTACT** Palm 0118 927 8700  
[www.palm.com/uk](http://www.palm.com/uk)

### SPECIFICATIONS

Dragonball VZ 33MHz processor • 16MB Ram • 8MB Flash Rom • PalmOS 4.1.1 • 53 x 53mm 16bit colour TFT, 320 x 320 pixels • SD/MMC card slot • Infra-red, Palm universal connector, headset jack • 181g • 77 x 122 x 17 (w x h x d) • Palm Desktop, PalmOS, Documents to Go, Versamail, Jot, Acrobat Reader, games • USB **PROS** Fast net access with GPRS; Imap mail supported  
**CONS** No browser; Sim socket lacks robustness; headset needed  
**VERDICT**

A good Palm PDA with built-in phone. Great for email access, but the headset isn't for everyone

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

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PC Pro, 04.03

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### STANDARD NOTINO W6700 FEATURES

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## INTERNET SERVICE

## AOL 8

This is no cosmetic upgrade - AOL 8 has great new spam-buster and always-on features



It doesn't look a lot different to its predecessor, but AOL 8 has lots of enhancements like spam filters for email (below) and The Companion (bottom)

connected, for not having the right kind of account. Manually selecting a new number sorted things out, but considering many first-time users will be attracted to AOL by virtue of its soft option reputation this is somewhat slack.

There are a number of quirky, but less vital features, such as animated smilies, wallpaper backgrounds for your Aim messages and a theme option that will change the client's entire interface. Our review code came with just a small selection of themes installed, but we didn't find any we liked as much as the default blue.

The overall feeling here is of a sturdy client with some truly innovative enhancements we'd like to see incorporated into the likes of Outlook, Mozilla, Eudora and the whole gamut of non-AOL online clients. Whether they are enough to tempt new members into the AOL fold remains to be seen, but they certainly warrant an upgrade for existing users.

Nik Rawlinson

Coming soon to the cover of a magazine near you (mid to late May, if the schedules are to be believed) is the latest revision of AOL's online client. Beyond the smoother, curved graphics it doesn't immediately look all that different to AOL 7, but a peek under the hood and some time spent playing with its new features soon makes the current release start to look very long in the tooth indeed.

The average AOL member spends more than an hour every day using the service to either browse the web or read the service's proprietary content channels. AOL, like everyone else, though, seems to have realised that 'stickiness' is no longer just a matter of great content. With a greater number of sites on the web offering the same or better content for free there needs to be a compelling reason to use a paid-for service.

So, there are better spam filters, pop-up blockers on the browser and the all-new AOL Companion, which we predict will be a permanent feature of a broadband user's desktop.

AOL has come up with some positive action in grappling with spam. Email is now sorted

automatically into one of four groups. The 'People I Know' are those who feature in your address book - which is also much improved with custom categories and the automatic addition of friends on your messenger buddy list.

'Bulk senders' are those AOL has identified as sending emails by the bucket-load, while 'Everyone' and 'People I don't know' speak for themselves.

Other email innovations include auto responders that reply to your mail when you're on holiday, 'share' buttons on the top of AOL channel windows for sending the channel hyperlinks to your email or messenger contacts, and a spam button for reporting unwelcome emails to the AOL staff.

The web page pop-up blocker is more intelligent than a simple window killer. Rather than zap the ads entirely, they are merely suppressed, with a small indicator at the bottom of the browser window showing how many have been stamped on. Clicking it lets you see what you've missed; in our experience it's rarely anything worth reading, but it's good to know you won't browse straight past a warning from your online bank.

The Companion, though, is the real innovation. This floats outside of the AOL window and gives access to online services while you're using other applications. It will shrink to a slim indicator showing just the number of messages and Aim sessions you have waiting, or expand to offer a wide range of supplementary services, such as Google searching, film finding or road mapping.

Sadly it wasn't clever enough to realise that PCW's office is in the middle of London's entertainment district, and it confidently assured us that there were no cinemas showing *The Recruit* anywhere nearby.

Our only other complaint surrounded the installation routine, which bombed out on our Windows 2000 system when not logged in as Administrator, in spite of having sufficient access rights. Beyond that, it was a simple process, and the client even had a go at picking the most appropriate dial-up number based on where we were calling from. Somehow it was convinced that we would need a freephone number, but we were roughly kicked off, as soon as it

## DETAILS

**PRICE** Client software free; £5.95/month for light access (less than seven hours/month); £10.99/month off-peak access; £15.99/month for dial-up access; £27.99/month for broadband access

**CONTACT** AOL [www.aol.com](http://www.aol.com)

## SYSTEM REQUIREMENTS

Pentium processor, Windows 98/ME/2000/XP, 64MB Ram (128MB for XP), 200MB of free hard disk space, 800 x 600 resolution in 256 colours, 28K modem, IE5 (IE6 for XP)

**PROS** Colourful and easy to use; genuinely useful dedicated content

**CONS** Some installation quirks

## VERDICT

**Offers some genuine benefits over and above its predecessor. It's well-suited to family use, and the email tools should help combat spam for AOL members, but only time will tell**

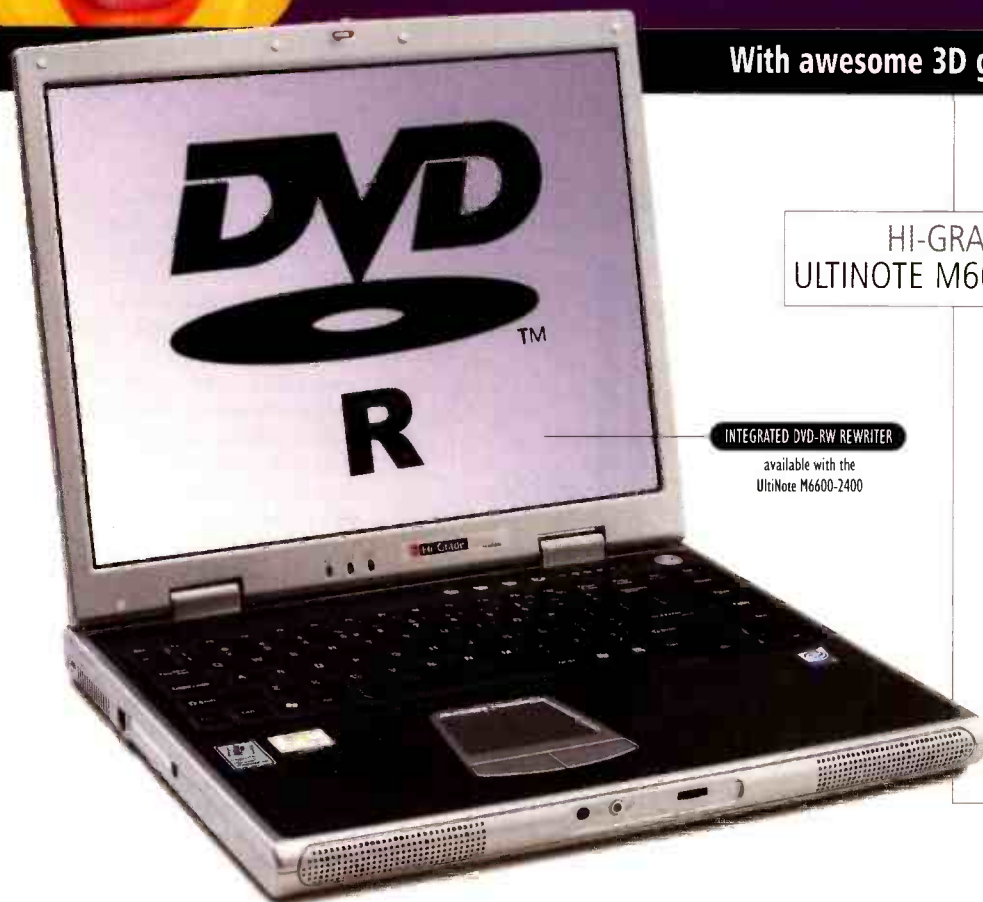
**EASE OF USE** ★★★★★  
**FEATURES** ★★★★★  
**VALUE FOR MONEY** ★★★★★  
**OVERALL** ★★★★★

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Computer Shopper, 05.03

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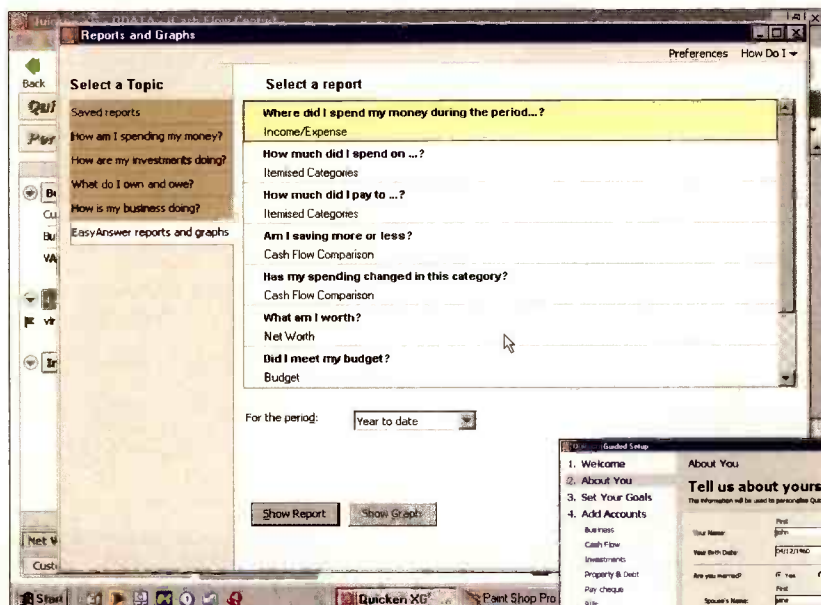
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## PERSONAL FINANCE

## Quicken XG

Yet another version of Intuit's personal finance software



XG picks apart  
your spending  
to see where  
you can save

The simple yet  
logical interface  
helps you set  
your goals

Another financial year, another version of personal finance giant Quicken – this time cryptically named Quicken XG. It must be dispiriting for manufacturers of personal finance software which aren't Intuit or Microsoft. You proudly launch your new package, then along comes a new cut of Quicken or Money to blow you out of the water.

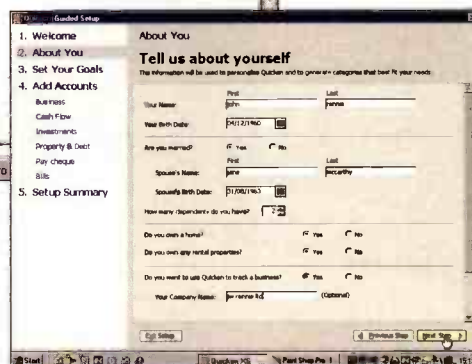
Not that Quicken XG is a revolutionary step forward, but the plus of having developed a reliable, simple and user-friendly piece of software, refined over many years and versions, is that it works, and you have hundreds of thousands of happy customers. The minus is that you have to tinker around with perfection each year in order to be new and improved and garner further sales.

But first the good stuff. It's a subjective call, but many people would rather die than swap their Quicken for any other personal finance package, and the reasons for that are still present in XG. The setup process is largely a doddle. You are interrogated for information about your personal financial health, and the process continues logically through

setting goals, adding your various accounts. It then produces a rather tidy home page with all your information at a glance.

Quicken's ace is its graphics, producing pie, flow and myriad other charts to help you quickly grasp why you are in the red each month, how to get into the black and where you are headed. Planning is high on the agenda, as you project your savings and retirement plans. You can also print out cheques and set up the calendar to ensure you don't miss payments of regular and ad hoc bills. Best of all, you can account for each penny, as you marshal your affairs from personal and business accounts.

So far so good, but what's new? The At-a-Glance feature groups your accounts into 'key areas' called Centres: you click on a Centre for a quick summary of your data; My Data Tab gives an overview of tasks for today; and you can minimise reports or features – Windows style – at the bottom of Quicken. Long time users might find the radical overhaul of the interface disconcerting, but we found it



created a tidy and usable screen. Intuit makes quite a play of its having beefed up the online support this time round. The only problem is that it comes at a price, courtesy of a service called Quicken Advantage. You can sign up to this for product support and product updates, as well as stock and unit trust prices and news. But there are so many excellent websites, of the calibre of [www.ft.com](http://www.ft.com) and [www.moneyextra.com](http://www.moneyextra.com), offering financial news free of charge that we doubt you'd choose to pay for it.

In fact, the obsession with 'online' started to get us down a bit with this version of Quicken. It started on installation when we had to disable Zone Alarm, in order to allow the product to register. And in use, the constant pleas of XG to go and get information/log-in/have a nice chat with [www.quicken.com](http://www.quicken.com) quickly became irritating.

We've got other minor quibbles with XG. The setup

process, while thorough, is irritatingly inflexible. When it comes to setting up regular bill payments, XG obligingly gives you a list of standard expense types – mortgage, gas, electricity and so forth – but these are all based around the US tax system – we don't pay 'auto insurance' and there's no mention of council tax anywhere. You can type in your own accounts later of course, but the presets show every sign of a US product adapted to the UK market with a carefree attention to detail.

However, as an all-in-one financial minder it is hard to knock. There is an increasing legion of freelance/small business Brits; people who have to combine a business invoicing and cost control system with a way of balancing the weekly groceries shopping, and a mortgage all the while peering toward an uncertain pension. Quicken XG will help users do that job simply, tidily and at a fair price.

John Rennie

## DETAILS

**PRICE** £59.99 (£49.49 ex VAT)  
**CONTACT** Intuit 01628 590800  
[www.quicken.co.uk](http://www.quicken.co.uk)

**SYSTEM REQUIREMENTS**  
133MHz Pentium or above, 32MB of Ram (64MB recommended), 54MB to 97MB of free hard disk space, Windows 95 or above, two-speed CD-ROM drive (four-speed recommended), video card and monitor capable of running 256-colour SVGA, Internet Explorer 5.5 or above

**PROS** Tried, tested and thorough  
**CONS** Irritating tweaks don't improve things

## VERDICT

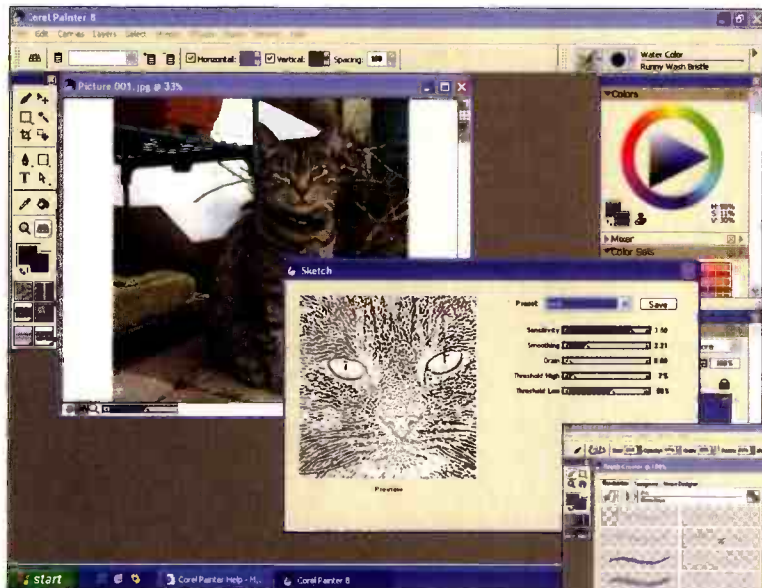
If you've been without a personal finance package look no further, but it's hard to justify upgrading from Quicken 2002 in terms of new features alone

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

**GRAPHICS TOOL**

# Corel Painter 8

A major upgrade of Corel's media design and illustration tool



The Sketch effect can turn any photo into a work of art, with sophisticated control over the look of the piece

Change a neon pen into a strange hairy-eyebrow brush with the Randomizer controls in Painter 8's Brush Creator tool



If you're not familiar with Painter from Corel, think of it as a media creation tool rather than an image editor. Bitmap-based, and using media such as digital chalks, paints and inks, it has long been the tool of choice as a sketch and painting application for digital artists. Painter's natural media tools have been emulated by Adobe in Illustrator and Photoshop, but where those implementations are slightly gimmicky, they still form the core of Painter's appeal.

Perhaps as a response to this Adobe onslaught, Painter now has full two-way support for the Photoshop file format. This is handy if you have both apps, but Corel has also provided upgrade paths, not only from previous versions of Painter but also for registered users of Photoshop. The process may not work entirely in both directions, as some psd files we tested contained effects and adjustment layers that Painter claimed were unsupported.

The improved Photoshop compatibility, however, does include support for preserving Painter's redesigned Layer Masks between the two applications (these allow you to hide and

reveal areas of images, without making permanent changes).

The biggest change in version 8, however, is the interface, with resizable palettes grouped and stacked on top of each other to create a less cluttered workspace. A floating toolbar to the left displays selectors for paper, pattern, gradient and weave, look and image hoses, while a context-sensitive property bar floats above the canvas window. The comprehensive Brush Selector is another Photoshop-friendly addition, while the Colors palette is similar to previous versions, with a Mixer palette below which lets you mix colours interactively. The palette contains a Brush tool for applying the colour, and a Palette Knife for mixing them.

As well as being fast and responsive, this is a lot of fun, and serious artists will find this mixing evocative of traditional colour creation. It's just another of the aspects that brings Painter back to being a digital alternative to the real thing.

There's also an Eyedropper for sampling colours to the Mixer, as well as Zoom and Pan tools

for navigation within the palette. Mixer palette settings can be saved for future use, and new custom colour sets can be created from your mix.

That's not all though. This major upgrade also includes 400 new brush variants in more than 30 mediums, including acrylics, digital watercolour, tinting, gouache and sumi-e, to name a few. As before, pressure-sensitive tablets and pens, like those from Wacom, add a new dimension to using the brushes, but there is more variety available too, with the new Brush Creator.

This includes three key features – the Randomizer, Transposer and Stroke Designer – all of which have live previews to let you view modifications. The first takes existing brushes and randomises their properties to create a new variant – high randomisation results in very different variants. The Transposer uses the properties of one brush variant to change the look of another, so you can mutate an F-X neon pen by

adding some of the properties of a blurry Photo brush. Stroke Designer, the final tab, creates brush variants using 16 sets of controls including size, spacing, rake, impasto and water.

Something that will interest many budding artists, as well as professional designers, is the Sketch effect, part of the Surface Controls toolset. This can convert images or photographs to simple 'pencil' drawings, featuring controls for the desired level of detail, the amount of paper grain applied and the heaviness of the pencil line. It's probably the simplest thing to use in Painter, with the biggest impact on illustrative work. It didn't always work though, as it was temperamental with some jpg images.

You have to be fairly skilled at art and design in the first place to get the best from Painter 8, but it is easy to pick up general techniques. The new features here set it apart from the image editors, so it's definitely worth a look if you're feeling creative.

**Michael Burns**

## DETAILS

**PRICE** £259 (£220.43 ex VAT), upgrade £149

**CONTACT** Corel UK  
01628 589 800

[www.corel.com](http://www.corel.com)

### SYSTEM REQUIREMENTS

200MHz Pentium or higher, 128 MB

of Ram, Windows 98SE/NT4/

2000/XP, 200MB of free hard disk

space, Wacom tablet recommended

**PROS** Lots of new brushes and new

effects; Photoshop compatibility

**CONS** A couple of slight bugs

still to be ironed out

### VERDICT

**Fully-featured natural media image creation tool, packed with new brushes, media and effects to spruce up your digital drawing. Good for budding artists and ideal for digital professionals**

**EASE OF USE**

★★★★★

**FEATURES**

★★★★★

**VALUE FOR MONEY**

★★★★★

**OVERALL**

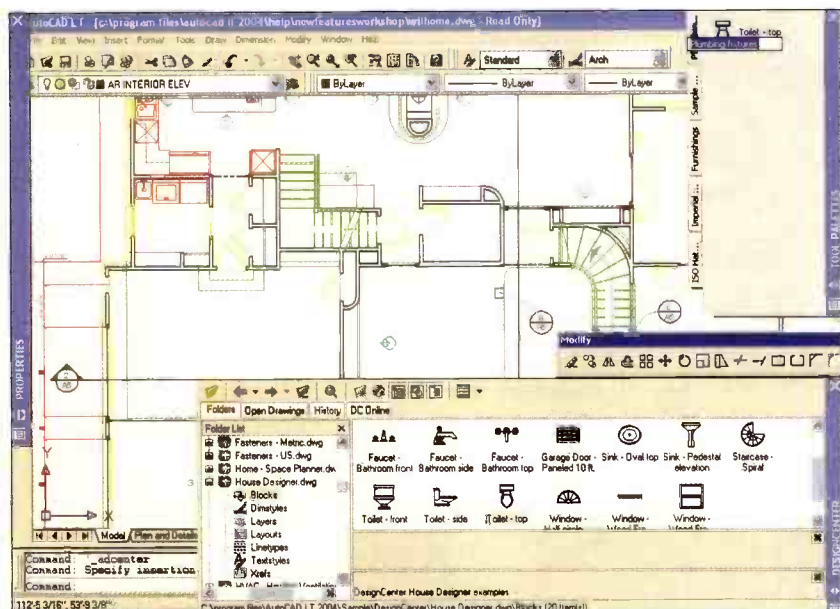
★★★★★



## CAD SOFTWARE

# Autocad LT 2004 and Turbocad 9

New releases from Autodesk and IMSI make computer-aided design more affordable



**Autocad LT 2004 features the Design Center, a repository of drawing content taken from local, network and web-based sources**

Tool palettes and populate them with predefined examples. You can also connect with Cad websites to link to manufacturers' catalogues and libraries for new blocks or product information. Content can be searched via keywords and using filtered searches.

Another 'connected' feature is the ability to email groups of drawings in electronic form to colleagues and clients. The Design Publisher environment uses the Publish tool to select the required plans for sending as a multi-sheet Design Web Format (dwf) file. This can be viewed in the standalone Autodesk Express Viewer, a free player available from the Autodesk website, or in other design applications.

To cope with the transferring of files, Autodesk has added a new level of security with the implementation of digital signatures. These are embedded within the drawing and are invalidated when any unauthorised change is made.

A status bar icon called the Validate Digital Signatures icon will warn when changes have been made and allow you to revalidate the signature using the correct password.

## Turbocad 9

Turbocad 9 also offers quick and easy ways to get into Cad, with tutorials covering basic line objects, simple round objects, editing and move tools. Many of the basic principles are the same as in the Autodesk package, but Turbocad 9 also offers tutorials on 3D modelling and editing – again concentrating on those features that bump this into the realms of a general design and mechanical engineering tool, not just one restricted to 2D drafting.

Tutorials are hands off – just simple movies that lead you through some basic techniques. And there's a lot of ground to cover for the beginner here, as is common with any application offering 3D modelling.

**A**utocad LT 2004, the 'lite' version of Autodesk's premier Cad package, is around a quarter of the price of the full-blown 3D-enabled application, but it's still too pricey for most wallets. Much cheaper is the Standard version of Turbocad 9 from IMSI. So how do the two compare?

Both applications follow a convention of model space – where you create and lay out the 2D model and paper space – where the finished drawing is laid out in its assorted elevations according to industry standards.

Autocad allows the use of independent viewports in both model and paper space to let you work more easily on individual parts of the drawing.

Turbocad has an advantage over its rival, however, with the added bonus of tools for creating, manipulating and rendering models in 3D space. Autodesk reserves this power for the full version of Autocad, but leaves the 2D toolset more or less intact in LT. By contrast, IMSI seems to reserve the lion's share of the more useful new features in both dimensions for the Professional version of Turbocad.

Both the packages we looked at share many features and processes. For example, both install on a single CD and use the mouse wheel to zoom. They also feature property inspectors, a layer-based workflow and standard tools for creating lines, arcs and curves.

## Autocad LT 2004

Autodesk seems to have gone for broke in easing the way for the user with this version of Autocad LT. Active Assistance provides context-sensitive help for the design task you are working on and, to further help you learn the ropes, Autodesk has included the New Features Workshop, a set of informative screens and tutorials. The first of these has a few layout mistakes and typos however, which takes the shine off this useful feature.

Another innovation is an auto update function in the shape of the Communication Center icon, which flashes in the status bar tray whenever needed.

Other icons include Manage Xrefs, which shows an alert when an external reference document attached to the drawing needs to be reloaded or resolved.

Xrefs are used when you want to incorporate additional drawings without making their data part of your current drawing (such as landscape info around a house floorplan) and are usually loaded when the master drawing is opened.

The Properties palette gives access to all the elements in your workspace and allows you to change the properties of selected objects from a centralised location. By selecting Auto Hide the palette can be kept on screen in minimized form until needed.

The Tool Palettes window floats over the workspace and snaps to the side of the program window when dragged over it. It features sets of commonly used symbols (blocks) and hatch patterns that you can insert into your drawing. Again the auto hide option is available and you have the ability to add blocks of your own or import tool palettes from co-workers.

Another floating window is the Design Center (DC), which is divided into a tree view and a content area. You can use this to browse for content anywhere on your hard disk or network. From here you can create new

### A digital signature attached to an Autocad file assures its validity

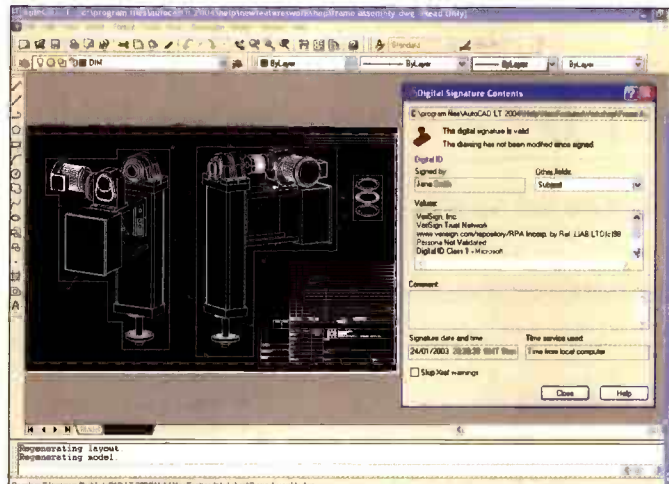
To ease the task, a new manual is included, replacing the software-based guide of previous releases. It's of the standard 'weighty tome' reference type, but as we said before, most of the more interesting functions described within seem to be reserved for Turbocad Professional only.

Turbocad 9 does have newly streamlined Copy, Mirror and Transform commands though. The Copy tools can be used on both 2D and 3D objects, and can now be used in any order. You can also simplify the moving, rotating and scaling processes by transforming multiple entities in one go.

There is also an improved range of snapping modes, both in 2D and 3D, for precisely placing the cursor where you want it. Turbocad 9 also introduces relative display priority, allowing users to change the display priority by multiple levels.

Other drafting and presentation improvements in this version include assignable background colours to distinguish model space and paper space. There's also Print Styles, which lets you set and apply pen and brush settings. Before sending the drawing to print, the colour, line style and brush of an object can be pre-determined via the Print Style Manager. Usefully, this doesn't need to affect objects on screen, appearing instead in the finished article.

On the 3D side, Turbocad 9 now simplifies work plane visualisation by enabling you



to toggle the display at the points where existing 3D objects intersect with the work plane, which we found useful.

Rendering, of course, is essential to 3D modellers and Turbocad 9 offers OpenGL and Raytrace methods, but seems to have left the high-end improvements in this version to the Professional package.

Nevertheless, Turbocad 9 is a fairly comprehensive modeller in its own right and you'll find it adequate for most basic tasks. It's always wise to do your modelling on a reasonably fast machine, however, like our 2.66GHz Pentium 4, which included an ATI Radeon 9500 graphics card that was ideal for rendering.

### Annotations

Both Autocad LT 2004 and Turbocad 9 have enhanced control over text, commonly used here for annotating drawings. The latter allows you to enter, edit and format paragraphs with multiple lines of text (multi-text) including some advanced formatting

capabilities. In addition, Turbocad 9 can embed multi-text with dimensions to enhance the display of the measurements of lines and angles. Dimensioning in Autocad LT 2004 simply involves selecting an object to add dimensions, with virtually all standard dimensioning types available for your use.

Turbocad 9 can also 'explode' any imported or native text into its constituent parts for greater creative control. Autocad LT 2004 meanwhile now allows you to use the Mtext Editor to create indents and tabs in its version of multiple line text, Mtext. This helps the onerous task of correctly aligning text in tables and numbered lists. Individual characters in the Mtext can also be selected for formatting styles.

File formats play a big part in Cad and, as well as tcf (the native vector file format), tct, the template format and the Ascii file format tcx, Turbocad 9 can read and export most of the common file format types. This includes the dwf export file format already mentioned and the import/export for Autocad's native dwg format. Autocad LT 2004 can, of course, import and export full dwg files as well as other native Autocad formats.

### Conclusion

Both applications are cut-down versions of grander packages, and although Turbocad 9 is by far cheaper and appears to offer more at first, it tends to trade on its association with the professional level product a bit

Turbocad 9 lets you easily set style properties before printing a file

too much. The more costly Autocad LT 2004 feels more like a targeted product, aimed at a drafting audience with no need of high-end 3D features and associated costs.

If this means you, and you can afford it, we'd suggest this is the path to take. However, if you are looking for an all-round introduction to computer aided design, you'll be hard pressed to find something more reasonably priced than Turbocad 9.

Michael Burns

### DETAILS

#### AUTOCAD LT 2004

**PRICE** £962 (£818 ex VAT)

**CONTACT** Autodesk

01252 456 789

[www.autodesk.co.uk](http://www.autodesk.co.uk)

#### SYSTEM REQUIREMENTS

800MHz Pentium III or later, 128MB Ram, (256MB recommended), Windows XP/2000 Professional/NT4 (SP6a or later), 200MB of hard disk space, 1,024 x 768 resolution VGA monitor with true colour, Internet Explorer 6

**PROS** Useful interface; text and security improvements; Internet connectivity fully exploited

**CONS** Expensive; some interface bugs; limited external format support

#### VERDICT

**Slick, well-presented design package targeted squarely at the 2D market. A host of interface enhancements augment the easy workflow of this architectural tool**

**EASE OF USE** ★★★★★

**FEATURES** ★★★★★

**VALUE FOR MONEY** ★★★★★

**OVERALL** ★★★★★

#### TURBOCAD 9

**PRICE** £69.99 (£59.57 ex VAT)

**CONTACT** Mediagold International

020 7221 4600

[www.turbocad.co.uk](http://www.turbocad.co.uk)

#### SYSTEM REQUIREMENTS

1.6GHz Pentium II, 128MB of Ram, Windows 98/ME/2000/XP/NT4, 55MB to 220 MB of hard disk space, 64MB of swap space, 3D graphics accelerator card, Net connection

**PROS** Highly compatible; all-round 2D and 3D design too

**CONS** Unintuitive interface

#### VERDICT

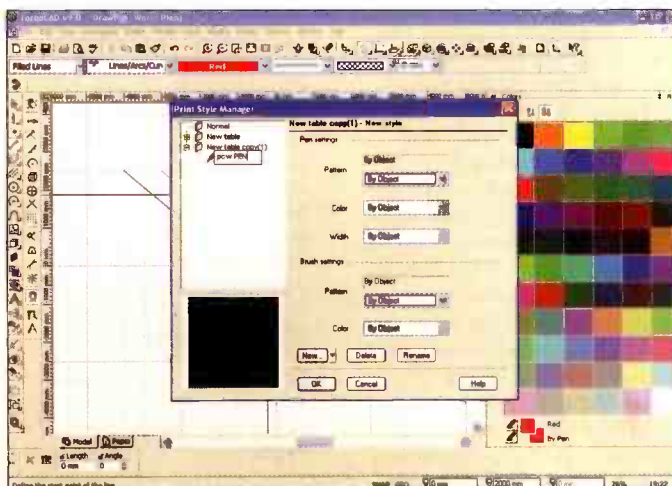
**This standard edition provides a good grounding for 2D and 3D Cad beginners, with some key text, printing and object editing improvements on past versions**

**EASE OF USE** ★★★★★

**FEATURES** ★★★★★

**VALUE FOR MONEY** ★★★★★

**OVERALL** ★★★★★

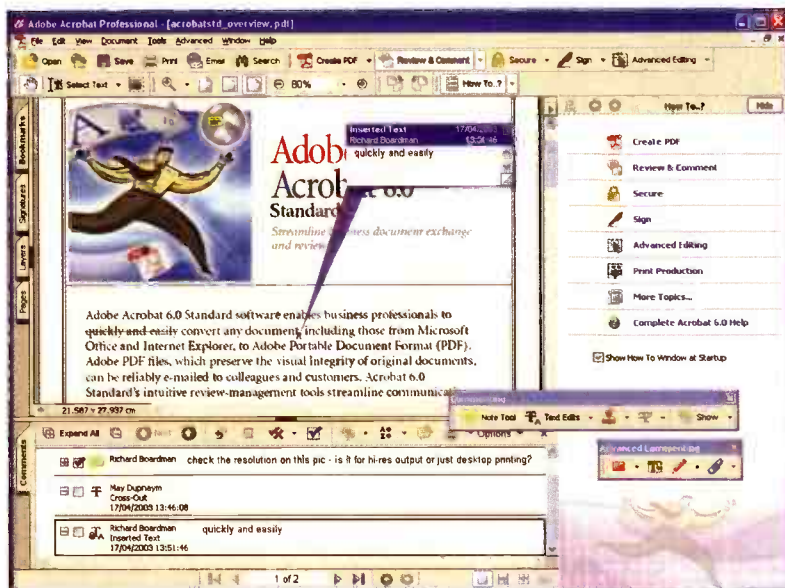




## PDF CREATOR

# Adobe Acrobat 6

Creating pdfs just got a whole lot easier



The new up-front interface style makes everything clear, from the drop-down button menus and 'how to' panel, to the much-improved comments panel and pointing annotations

On that note, web pages captured to pdf now have their Macromedia Flash content preserved. This is possible because the pdf file format itself has been upgraded to 1.5. This new format supports jpeg2000 image compression, and

is finally able to fully embed multimedia content instead of linking to external audio and movie files. Further multimedia support is evident in the new Read Out Loud command, which uses voice synthesis to read the text in a pdf back to you. And if you liked Acrobat 5's ability to create pdfs directly from graphic files on your hard disk, you will love the way Acrobat 6 has extended the variety of supported import formats and lets you create a multipage pdf from multiple source files with just one click.

Also improved are the collaborative tools which let colleagues indicate corrections and add annotations and comments to a pdf. As well as adding a set of new drawing shapes and some very useful proofreading markup tools, the collaborative interface is much clearer than before. Floating Note windows visually point to their relevant markup locations in the document, and the Comments panel has been redesigned to run horizontally at the bottom of the screen, making it far easier to read.

But for more advanced pdf creation options, as well as text and graphic editing tools, you

will need the Professional edition. Here you can scan hardcopy documents from within Acrobat 6 and let the built-in OCR engine convert them to pdf automatically. If you own a copy of Microsoft Visio or Autodesk Autocad, you can generate a multilayered pdf of your technical drawings, letting you show and hide the layers as desired.

Perhaps best of all, Acrobat 6 Professional and Standard have been treated to an extensive interface makeover. Although it represents several strides away from Adobe's own interface conventions, Acrobat 6 is immeasurably easier to use as a result. Tool and command buttons have been enlarged, labelled and re-organised into categorised drop-down menus. A 'how to' panel leads you through the basics, and the main menus are organised in a more logical manner. More than ever, though, Acrobat 6 is a power-user's package but it's now also a first-time user's delight.

**Richard Boardman**

### DETAILS

**PRICE** Professional £417.13 (£355 ex VAT), upgrade £128.08 (£109 ex VAT); Standard £276.13 (£235 ex VAT), upgrade £88.13 (£75 ex VAT)  
**CONTACT** Adobe 020 8606 4001  
**www.adobe.co.uk**

#### SYSTEM REQUIREMENTS

Pentium with 64MB of Ram, 245MB of free hard disk space, 1,024 x 768 display, Windows NT4(SP6)/2000 (SP2)/XP

**PROS** One-click export from Office; redesigned program interface

**CONS** Professional is expensive; no pdf editing functions in Standard

#### VERDICT

As well as upgrading Acrobat to be more powerful and feature-rich, Adobe has finally made the package easy to use, but choose wisely between editions or it could be a costly mistake

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

One of the concerns about Acrobat is that it seems to be overkill for ordinary office work, but under-featured for high-end electronic publishing. With Acrobat 6, Adobe has attempted to resolve this. Acrobat is now available in two flavours: a Professional edition for the publishers and advanced pdf editors, and Standard edition for people who simply want to create pdfs and use the collaborative approval tools.

First, here's a quick recap of what the package does. Acrobat converts any document created using any application into a cross-platform 'pdf' file. To open and print these pdfs, all you need is a copy of the free Adobe Reader program: you don't need the original application, or to be running the same computing environment. Pdfs can incorporate internal and external hyperlinks, maintain graphically rich content, and any text in the documents is fully indexable and searchable. It's no wonder that pdf is the chosen format for web and CD-based brochures, technical manuals and ebooks.

In recent years, the compressed, Postscript-based pdf format has also become

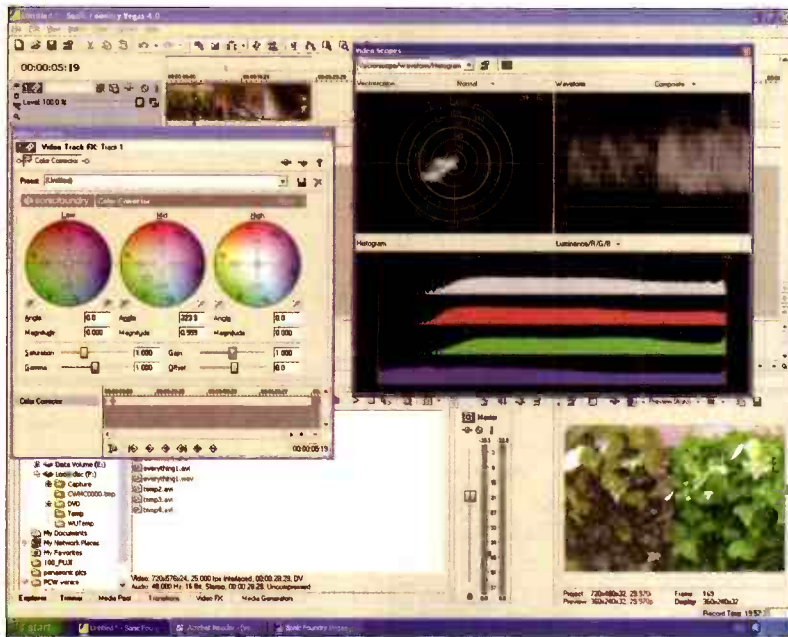
very popular in high-end publishing, with Adobe relying on third-party plug-ins for specialist prepress functions. With Acrobat 6 Professional, much of this is now built in. The upgrade includes its own comprehensive and customisable preflighting routine to ensure smooth transition to the presses. It also lets you preview on screen and directly print individual colour ink separations, while choosing how to flatten Postscript 3 transparency effects.

Of course, these are features no typical PC user will ever use, hence the availability of Acrobat 6 Standard, which is identical to Professional, except without all the prepress features. Both editions have streamlined pdf creation from Microsoft Office applications by installing a small Acrobat button bar in each. Although the dreaded Acrobat Distiller program still exists in the upgrade, you'll probably never have to run it as the 'Adobe pdf' printer driver now lets you print straight to pdf transparently, complete with font embedding and encryption settings. There's even a one-click create pdf button installed to Internet Explorer.

**AUDIO/VIDEO EDITOR**

# Sonic Foundry Vegas 4

New editing features make this an easier package for beginners, but it comes at a price



**Extensive monitoring tools ensure your video remains within legal broadcast minutes**

be displayed simultaneously in the window. The two most useful are the vectorscope, which displays the pixel hue and saturation distribution on a radial chart marked with broadcast-safe areas, and the histogram, which can simultaneously display luminance distribution for all three RGB channels.

Colour adjustments made this way can be keyframed and during timeline playback the videoscopes update in real time, so you can check that levels remain within limits for the whole production, rather than just the frame that was previewed while the adjustment was made.

New editing features include improved ripple editing, keyboard-based event trimming, storyboard-style event shuffling and split-screen previews. Getting to grips with editing on the timeline is one of the biggest hurdles for newcomers, so these editing extras will help ease the learning curve.

Also, like Premiere and Media Studio, Vegas now has a linked DVD-authoring option in the form of DVD Architect, included in the optional Vegas+DVD pack.

Post-edit ripples can be applied manually or automatically and can be restricted to the edited event's track, or more widely applied to all tracks, markers and regions.

Cursor preview creates a two-second loop extending either side of the cursor so you can quickly check an edit. This is useful, but we'd prefer to see a

split-screen display of the out and in frames of adjacent clips along the lines of Premiere's trim window. The split trim mode of the preview window does this when you slip a single event on the timeline – simultaneously displaying the same function to edge trimming would be the icing on the cake.

Sound features have been revised, with the addition of 5.1 surround mixing tools that provide keyframeable panning. Unless you plan to post encode, you'll need the Vegas+DVD option, which includes the new Dolby digital AC-3 encoder.

Other additions and enhancements – including 10 new automated audio effects, support for ASIO drivers, new filters and transitions and searchable media pool bins – make this a significant upgrade that will find favour with existing Vegas users and newcomers, but it's very expensive. Were the DVD Architect and the AC-3 encoder included in the original base price this might have been a real alternative to Premiere.

**Ken McMahon**

**W**hen Sonic Foundry launched version 3 of its video-editing application, it began to look like a serious competitor to Adobe Premiere. With the release of version 4, the company has added a number of advanced editing features which will make it more attractive, particularly to those who are familiar with Sonic Foundry's audio products.

Top on the list of new features are advanced colour analysis and correction tools. Vectorscope, waveform and histogram charts, similar to those in Apple's Final Cut Pro, provide real-time monitoring of the video signal, and a new primary three-wheel colour correction plug-in provides a versatile means of eliminating casts and balancing clips from multiple sources.

A new Motion Blur envelope adds blur to each frame to simulate movement, while smart resampling makes an easier task of matching material with differing frame rates.

Parent Overlay Video Track mode allows a plug-in to control how a parent track modifies the tracks in its composite

group, and can be used with displacement and height maps to produce mirror, water, fire and similar effects.

The colour-correcting tools, used in combination with the videoscopes and the split-screen preview window, provide an effective means of colour control with instant visual and graphical feedback. They ensure results look right and don't stray outside broadcast-legal levels.

The three-wheels of the primary colour corrector are used to adjust colour balance separately for shadows, mid-tones and highlights. Hues are distributed around the circumference and saturation increases from the centre towards the edge. To make an adjustment you simply drag the centre spot to the appropriate location, view the results in the split-screen preview window and check the graphical feedback in the videoscopes. Two eyedroppers below each wheel are used to add sampled or complementary colours to the mix, and saturation, gain, gamma and offset sliders provide further adjustment. All three videoscopes can

**DETAILS**

**PRICE** £599 (£509.79 ex VAT)  
**CONTACT** SCV 020 7923 1892

[www.sonicfoundry.com](http://www.sonicfoundry.com)

**SYSTEM REQUIREMENTS**

400MHz processor, Windows-compatible sound card, 128MB Ram, 30MB hard disk space, DirectX 8

**PROS** Improved video and sound editing tools, new image effects

**CONS** Expensive, DVD authoring and AC-3 encoding cost extra

**VERDICT**

Plenty of new and useful features keep Vegas well in contention for anyone starting out. Sonic Foundry needs to pay more attention to the interface to improve ease of use, as some features are hard to master

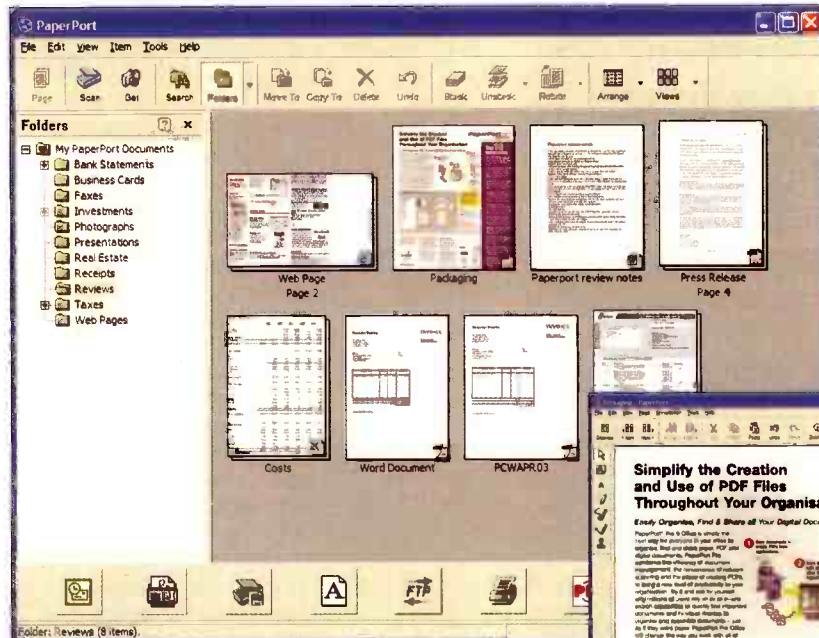
<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## DOCUMENT MANAGEMENT

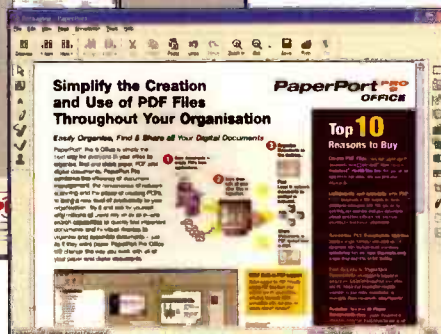
## Scansoft Paperport 9

Ease the transition from paper to hard disk, with this pdf creator and editing tool



The main Paperport 9 interface, showing the thumbnails of a selection of Word, pdf, Excel and image documents

The page editing screen, with tools for adding annotations on the left, and for editing the image on the right



The paperless office is up there with virtual reality as one of the unrealised aspirations of the digital age. Nevertheless most users, both corporate and personal, will find an increasing proportion of their paperwork migrating from paper to hard disk. Paperport Professional 9 Office is designed to ease the transition.

Paperport was originally a tool for managing scanned documents. In this latest version, Scansoft claims it has become a complete information management system, enabling you to 'easily organise, find and share all your digital documents'. On a more practical level, it also boasts native support for Adobe's portable document format (pdf), now well established as a standard for digital documents.

The main interface for Paperport 9 is the desktop, which isn't much different to a Windows Explorer window. There's the usual menu and toolbar running along the top of the window, and a panel on the left showing a list of Windows folders (which can include those held on a network as well as

locally). In the main part of the window, a list of the files in the current folder is displayed by name or as thumbnails. Whereas a Windows Explorer window is able to show thumbnails only of picture files, Paperport 9 can display an impressively wide variety of formats, including Microsoft Word and Excel, though the usefulness of this is limited, as the thumbnail images are illegibly small.

Documents on the desktop can be manipulated in a number of ways. For example, pdfs with multiple pages can be 'unstacked', broken up into their individual pages and scattered across the desktop, from where they can be restacked in a new order, or rearranged into smaller files. Double-clicking on any of the thumbnails produces an editing window, which offers an assortment of tools for manipulating the document's image – depending on the format – from adding annotations to pdfs to reducing red-eye in photos. Paperport 9 includes an OCR feature for

turning document images into text files. This is automatically invoked when a document is indexed by Simplesearch, Paperport 9's search engine. All documents on the desktop containing text can be added to the Simplesearch index, and you can then search for any word they contain. The index can also be set to update automatically, to include any new items imported into the desktop.

At the bottom of the Paperport 9 screen there's a series of icons for sending desktop documents to other applications. This includes sending to Microsoft Outlook, emailing as an attachment to the OCR engine, sending to an FTP client, to 'Formtyper' – a very basic form-creation tool – to Paperport Online – an online archiving and file sharing service – and to corporate 'content management systems', such as Oracle 9i and Microsoft Sharepoint, when network access is available.

There is also a set of tools for importing items. 'Scandirect',

for example, is a standalone toolbar which can be used to drop scanned items directly onto the Paperport 9 desktop without having to open the program itself. It also supports facilities such as automatic document feed. 'Web Capture' is a utility that runs in the background, and can be used to capture the page currently displayed in the system's web browser, splitting it into multiple pages if it doesn't fit into a single window.

Though updated by this new release, Paperport 9 still feels like an old product, and it is beginning to creak. It looks and feels as though it is stuck in the Windows 95 era and, most importantly, the majority of features it offers are now available, one way or another, through Windows XP.

Even the Simplesearch facility is only a slight improvement on XP's own offering, with the addition of basic fuzzy searching, for example. The OCR, too, is useful but very basic. All in all, this makes for a package that is characterised by its limitations rather than its potential.

Its saving grace is the pdf support. While rudimentary, it will be sufficient for users wanting to standardise around the format, without having to buy Adobe Acrobat.

Benjamin Woolley

## DETAILS

PRICE £139.99 (€119.14 ex VAT)

CONTACT Scansoft 0118 963 7464

www.scansoft.co.uk

## SYSTEM REQUIREMENTS

Pentium or equivalent, 128MB of Ram, Windows 98(SE)/ME/NT4/2000/XP, 80MB of free hard disk space

PROS Native pdf support

CONS Feels out of date

## VERDICT

A useful pdf creation and editing tool, but otherwise of limited use

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

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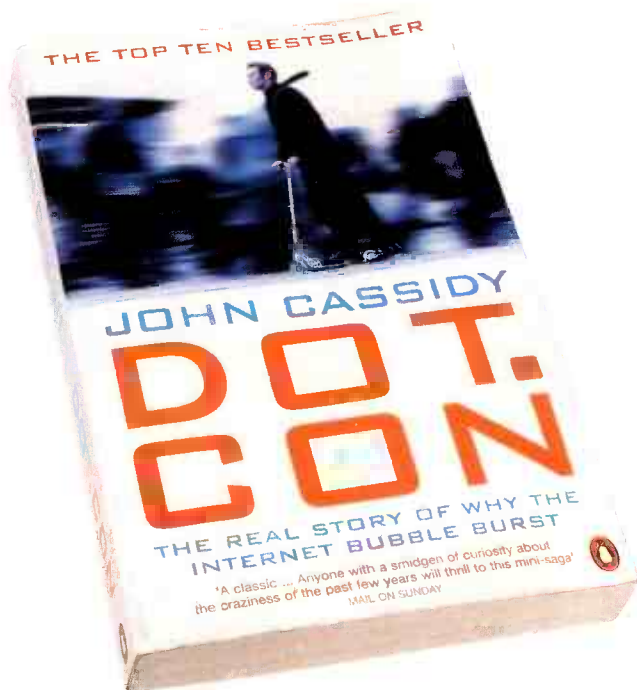
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# Dot.con: why the bubble burst

Find out just what did happen to the dot com boom



In years to come people will doubtless see the web as no more than the culmination of a communications revolution spanning a little over a century and a half. It is, after all, just a computerised refinement of the telegraph, the invention that launched the revolution.

Yet it was a step change, and its importance was clear from the start. Many of those who downloaded the first Mosaic browser in 1993 knew they were involved in something momentous: the equivalent of riding in Stephenson's steam-powered Rocket, or Orville and Wright's aeroplane. Mosaic transformed the Internet from a cumbersome academic tool to a friendly mass-medium, and the world would never be quite the same again.

The railway parallel is apt because that technology, like the web, spawned a speculative boom and bust in its early days. The dot com madness is commonly attributed to the hype surrounding the technology but, as John Cassidy points out in his fascinating

*Dot.Con: The Real Story of Why The Internet Bubble Burst*, it would not have happened without a real basis for the excitement.

The web and the railways each had a potential that was almost beyond hype; the problems began when people started to believe that anything to do with the technology was bound to make money.

Cassidy relates how several factors served to inflate the web bubble. Tax changes encouraged people to put money into mutual funds, making vast sums available for investment. Regulatory changes, and the web itself, made it easier for ordinary people to buy shares. A near-mystical faith in the primacy of the market delayed US government intervention.

People bought shares in dot coms, which sent prices higher, which, in turn, encouraged more people to buy at yet higher prices – a self-reinforcing cycle exemplified early in an initial public offering (IPO) of shares in Netscape, co-founded by Silicon Graphics founder Jim Clark and Mosaic developer

Marc Andreessen. Shares were offered at \$28, which was thought high, but within a day the price more than doubled, valuing the company at \$2.2bn. If Netscape had owned basic browser patents this might have made sense. But it didn't, and it was giving away most copies of its browser in the hope (vain, as it happened) of capturing the market before Microsoft got in.

A pattern was set that someone pitched a web-related business idea to a new breed of trendy venture capitalists who, in turn, financed the launch and heavy promotion of the company, which was usually, but not exclusively, a dot com. The company then issued an IPO – an acronym that quickly turned into a buzzword – as soon as possible and amid considerable razzmatazz.

Cassidy explains one of the most puzzling aspects of the bubble – where the finance for the fantastic valuations that ensued came from – they were based mostly on 'funny money'. Only a small amount of stock was sold for real money at the inflated price, but the same value was attributed to the majority shares owned by the founders and original investors. The flimsiest of enterprises created paper multi-millionaires overnight, and the IPO quickly became more important than products and profits.

This speculative frenzy became an industry in itself. Entire TV channels and websites were devoted to it. Many people knew they were caught up in the bubble but went along with it because there was a lot of money to be made. More astonishing was the number of people who appeared to believe the valuations. TV channels only wanted people who would spout good news, and paraded a succession of 'experts' talking up stocks. Gainsayers, according to Cassidy, were simply not invited back. Even more dubious was the role of some of

the leading US financial institutions, whose star analysts both talked up values and profited from them by floating IPOs. These rejected all the usual valuation metrics on the grounds that this was a new economy with new rules.

Some of these true believers seem naive, and you wonder how they got where they did; some undoubtedly deceived themselves. However, the assumption must be that many people on Wall Street were deceiving investors. The culture that bred scandals like Enron had deep roots.

The trick in profiting from a bubble is to get out before it bursts. Cassidy reckons one of the smartest moves was made by Steve Case of AOL when he made a bid for Time Warner – buying solid assets with his own stratospherically overvalued stock.

In the spring of 2000, a small stock issue by Palm Computing reached \$60 (£38 approx) per share within a day, valuing the company at \$54.3bn, which was \$26.3bn more than its parent company, 3Com, which still owned 95 per cent of Palm stock. The absurdities were becoming impossible to ignore, and within days the market began to slide.

The irony is the web is flourishing, even in its primitive infancy, and will become all that it was ever trucked up to be by the hucksters of Wall Street. By then they will be largely forgotten, as are the men who went bust building the railways. Cassidy has done us a service by providing a gripping account of how history can repeat itself.

Clive Akass

## DETAILS

**TITLE** *Dot.con: The Real Story of Why the Internet Bubble Burst*  
**PRICE** £7.99  
**AUTHOR** John Cassidy  
**PUBLISHER** Penguin  
**ISBN** 0-141-00666-8  
**OVERALL** ★★★★★



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# Best Buys

## YOUR GUIDE TO TODAY'S TOP PRODUCTS >>

### ENTRY-LEVEL PC

Systemax Inspire 3127

REVIEW June 2003, p51 PRICE £821.33

(£699 ex VAT) CONTACT Systemax 0870 7297 366

[www.systemaxpc.co.uk](http://www.systemaxpc.co.uk)



An Nvidia Nforce2 motherboard shows its performance, with an Athlon 2500+ and a Geforce FX5600 Ultra graphics card. A 19in monitor makes this an amazing bargain for an entry-level system.

### MID-RANGE PC

Multivision Vision KT4 bundle

REVIEW January 2003, p123 PRICE £1,056

(£899 ex VAT) CONTACT Multivision 0870 066 0885

[www.multivision.co.uk](http://www.multivision.co.uk)



An Athlon 2200+ with 512MB of Ram gives this PC the edge in its price range. The graphics are handled by Gainward's Ti4200 Geforce4 and the excellent Iiyama 19in monitor.

### HIGH-END PC

Hi-Grade Ultis PV4 GPW02

REVIEW February 2003, p109 PRICE £1,410

(£1,200 ex VAT) CONTACT Hi-Grade 020 8532 6123

[www.higrade.com](http://www.higrade.com)



Backing up the 2.8GHz CPU and 512MB of Ram is a massive 160GB Raid array and a Geforce4 Ti4800. A front-mounted unit takes various memory cards and features USB2 ports.

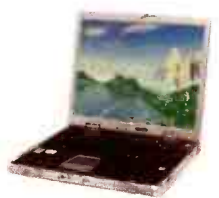
### FULLY FEATURED NOTEBOOK

Hi-Grade M6600-2500

REVIEW June 2003, p46 PRICE £1,761.33

(£1,499 ex VAT) CONTACT Hi-Grade 020 8532 6123

[www.higrade.com](http://www.higrade.com)



This notebook offers great performance thanks to a 2.5GHz Pentium 4 Mobile processor, 512MB of memory and a Geforce 440 Go chip. It also has a DVD-RW drive and memory card reader.

### ULTRA-PORTABLE NOTEBOOK

Apple Powerbook G4 12in

REVIEW April 2003, p108 PRICE £1,399

(£1,190.63 ex VAT) CONTACT Apple 0800 039 1010

[www.apple.com/uk](http://www.apple.com/uk)



Bringing Apple's style to the notebook arena, the Powerbook G4 12in combines a powerful processor with an innovative case design. Wifi and USB2 are the only missing features from this desirable system.

### BUDGET NOTEBOOK

Toshiba Satellite 3000

REVIEW July 2002, p108 PRICE £999

(£850 ex VAT) CONTACT PC World

[www.pcworld.co.uk](http://www.pcworld.co.uk)



Fully featured and less than £1,000, the 3000 performs well, and its battery life is up there with the best. It's also the only notebook in its class capable of completing our graphics tests.

### FLAT-PANEL MONITOR

CTX PV722E

REVIEW May 2003, p69 PRICE £440.63

(£375 ex VAT) CONTACT CCL Computers 01274 471 201

[www.cclcomputer.co.uk](http://www.cclcomputer.co.uk)



CTX has updated the previous model in this range with a powered USB2 hub and a detachable speaker section. The display performance is good with excellent viewing angles. A pivot mode is also included.

### 17IN CRT MONITOR

NEC-Mitsubishi Diamond Pro 750SB

REVIEW October 2002, p61 PRICE £157.44

(£134 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



The 750SB is pretty much infallible as far as 17in monitors go. It's very compact, reasonably good looking and has fantastic image quality, but it's the price that really stunned us.

### 19IN MONITOR

CTX PR960F

REVIEW June 2002, p125 PRICE £316.07

(£269 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



Excellent image quality, as well as a USB hub, make this 19in monitor more than worth its £335 asking price. Although a little on the large side, it does have both VGA and BNC inputs.





## PDA

### Palm Tungsten T

REVIEW January 2003, p61 PRICE £269

(£229 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



The first device to adopt Palm OS5 is also one of the best PDAs around. It features Bluetooth, the screen is almost without fault and it's the fastest PDA we've ever laid our hands on.

## POCKET PC

### HP Ipaq 1910

REVIEW May 2003, p72 PRICE £257.32

(£219 ex VAT) CONTACT HP 0845 270 4222

[www.hp.com/uk](http://www.hp.com/uk)



This may be the smallest Pocket PC available, but no compromises have been made in its capabilities. The screen is excellent under all conditions. There is an SD slot and 64MB of Ram.

## MULTIFUNCTION DEVICE

### Hewlett-Packard PSC 2210

REVIEW January 2003, p82 PRICE £219

(£186.39 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



This multifunction device is a rarity as it offers print and scan quality that is normally only seen in standalone devices. Card slots are also included making this an excellent bargain.

## SCANNER

### HP Scanjet 4500c

REVIEW February 2003, p125 PRICE £116.32

(£99 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



Once again, HP shows that it can combine good hardware with great software. The scanner has plenty of shortcut buttons and won't keep you hanging around for scans to finish either.

## LASER PRINTER

### Epson EPL-5900

REVIEW April 2003, p179 PRICE £222.07

(£189 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



Excellent photo and text quality, backed up by exceptional ease of use put the EPL-5900 in good stead. It may not be much to look at but it's a speedy worker that's ideal for the small office.

## INKJET PRINTER

### Canon i320

REVIEW January 2003, p89 PRICE £45.82

(£39 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



It may not be much of a looker, but the i320 is superb value. Photo printing is just as good as many models at twice the price, and it is very easy to use. All this for under £50 makes it irresistible.

## WEBCAM

### Philips Touchcam Pro PCVC-740K

REVIEW March 2002, p139 PRICE £69.32

(£59 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



This is a brilliant webcam that can be used for high-resolution still snaps, or 60fps video at 640 x 480. It is even capable of text recognition with the help of Xerox's Pagecam technology.

## SPEAKERS

### Acoustic Energy Aego2

REVIEW April 2002, p138 RRP £299.95

PCW SPECIAL OFFER PRICE £79.95 + £7.50 P&P

(£68.07 ex VAT) CONTACT [www.offersdirect.pcw.co.uk](http://www.offersdirect.pcw.co.uk)



Dressed in stylish plastic, the Aego2s are the best-looking 2.1 speakers we've seen. Sound quality is almost infallible too but, as you'd expect, a setup of this quality comes with a big price tag.

## SOUND CARD

### Creative Audigy 2 Platinum EX

REVIEW May 2003, p76 PRICE £174

(£148.09 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



This feature-filled card and external unit provides 24/96 recording, 6.1 sound and loads of software, including Cubasis VST 4.0 CE for music makers, and Ulead Videostudio SE DV for movie buffs.

## LOW-END SPEAKERS

### Creative Inspire 6700

REVIEW December 2002, p59 PRICE £88.12

(£75 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



These 6.1 speakers are great sounding, and not too bad to look at either. They are also capable of 'upmixing' a 5.1 signal to a 6.1 one, as well as having one of the lowest signal-to-noise ratios around.

## SOCKET A MOTHERBOARD

### Chaintech 7VJL Apogee

REVIEW November 2002, p149 PRICE £76.95

(£65.49 ex VAT) CONTACT Scan

[www.scan.co.uk](http://www.scan.co.uk)



It's certainly not a looker, but the 7VJL is a brilliant performer. It has four front-mounted USB ports, a head-phone socket and onboard sound all for under £80. Could you ask for more?

## PENTIUM 4 MOTHERBOARD

### Gigabyte GA-SINXP1394

REVIEW June 2003, p54 PRICE £135.13

(£115 ex VAT) CONTACT Gigabyte 01908 362 700

[www.gbt-tech.co.uk](http://www.gbt-tech.co.uk)



A host of features and added extras raises this board above the rest. Its core is the SiS 655 chipset, offering Dual DDR performance, as well as USB2 and Firewire.

## DIGITAL VIDEO CAMERA

Sony TRV33E

REVIEW July 2003, p142 PRICE £589

(£501.28 ex VAT) CONTACT Sony 0870 511 1999

[www.sony.co.uk](http://www.sony.co.uk)



This slimmed down model uses an innovative touch screen menu. The Super Steady Shot image stabiliser is included, as well as still image options and anamorphic 16:9 recording.

## GRAPHICS CARD

Gainward Powerpack Pro/450 TV

REVIEW August 2002, p118 PRICE £50

(£42.56 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



Geforce MXs mean great value for money. This card has a single VGA and a TV-out in addition to good performance. However, there isn't any extra software beyond the Nvidia drivers.

## VIDEO-EDITING CARD

Hercules All-In-Wonder 9000 Pro

REVIEW March 2003, p74 PRICE £185

(£157.45 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



The latest edition of the All-in-Wonder series offers the 9000 chip running at full speed. There's a breakout box and radio remote control, although it is lacking a Firewire port.

## DIGITAL CAMERA

Canon Power Shot A70

REVIEW June 2003, p128 PRICE £257.32

(£219 ex VAT) CONTACT Dabs

[www.dabs.com](http://www.dabs.com)



Excellent picture quality combined with a great range of features makes this camera stand out. Although a little heavy, the A70 offers a 5cm macro and 3x optical zoom with its 3.3megapixel CCD.

## DVD-RW

NEC Multispin ND-1100

REVIEW July 2003, p71 PRICE £185

(£157 ex VAT) CONTACT NEC 0870 0106 3225

[www.nec.co.uk](http://www.nec.co.uk)



Lending support to the DVD+ format, the NEC also delivers good CD writing performance. The software bundle is comprehensive, including Nero v5 and Sonic MyDVD

## CD-RW

Asus CRW-4816A

REVIEW October 2002, p116 PRICE £44.58

(£37.94 ex VAT) CONTACT SMC Direct 01252 339 706

[www.smcdirect.com](http://www.smcdirect.com)



Optimised for quiet and error free performance the CRW-4816A stands out from the crowd. To top it off Nero is supplied while buffer underrun protection supports the 2MB buffer.

## OFFICE SOFTWARE

Ability Office

REVIEW April 2003, p194 PRICE £50 (£42 ex VAT)

CONTACT Ability 020 7231 1004

[www.uk.ability.com](http://www.uk.ability.com)



Costing a fraction of Microsoft Office's price, Ability Office still manages to offer a similar look and features. There isn't a presentation package although it does include a macro language.

## UTILITY SOFTWARE

Zone Labs Zonealarm Pro

REVIEW February 2003, p73 PRICE \$49.95

(£32 approx) CONTACT Zone Labs

[www.zonelabs.com](http://www.zonelabs.com)



Building on the success of the free version, Zonealarm Pro offers more security but keeps the easy-to-use interface. However, support is limited to email and it is only available online.

## WEB-EDITING SOFTWARE

Macromedia Dreamweaver MX

REVIEW December 2002, p153 PRICE £319

(£271.50 ex VAT) CONTACT Macromedia 0800 169 8216

[www.macromedia.com/uk](http://www.macromedia.com/uk)



A very powerful web-editing suite that supports most server technologies and integrates with other Macromedia products, Dreamweaver demands some effort but the results are worth it.

## IMAGE-EDITING SOFTWARE

Corel Draw Graphics Suite 11

REVIEW July 2003, p128 PRICE £457.08

(£389 ex VAT) CONTACT Corel

[www.corel.com](http://www.corel.com)



Corel Draw Graphics Suite is easy to use, with a great selection of filters, fonts and clip art. An invaluable error catching ability gives you a chance to save files before a crash.

## VIDEO-EDITING SOFTWARE

Ulead Video Studio 7

REVIEW July 2003, p149 PRICE £46.99

(£39.99 ex VAT) CONTACT Ulead 01327 844 880

[www.ulead.co.uk](http://www.ulead.co.uk)



With a simple interface and lots of tools, this is a great choice for the amateur. Real time preview could be better, but other tools such as automatic scene detection are valuable.

## GRAPHICS SOFTWARE

3D Studio Max 5

REVIEW December 2002, P85 PRICE £3,166.63

(£2,695 ex VAT) CONTACT Tyrell Corporation

020 7343 5500 [www.tyrell.co.uk](http://www.tyrell.co.uk)



This edition of 3D Studio Max builds on its previous success with more powerful tools and increased functionality. Despite its high cost this is the best package around.







For this season's most effective power colours, consult your nearest HP printer.

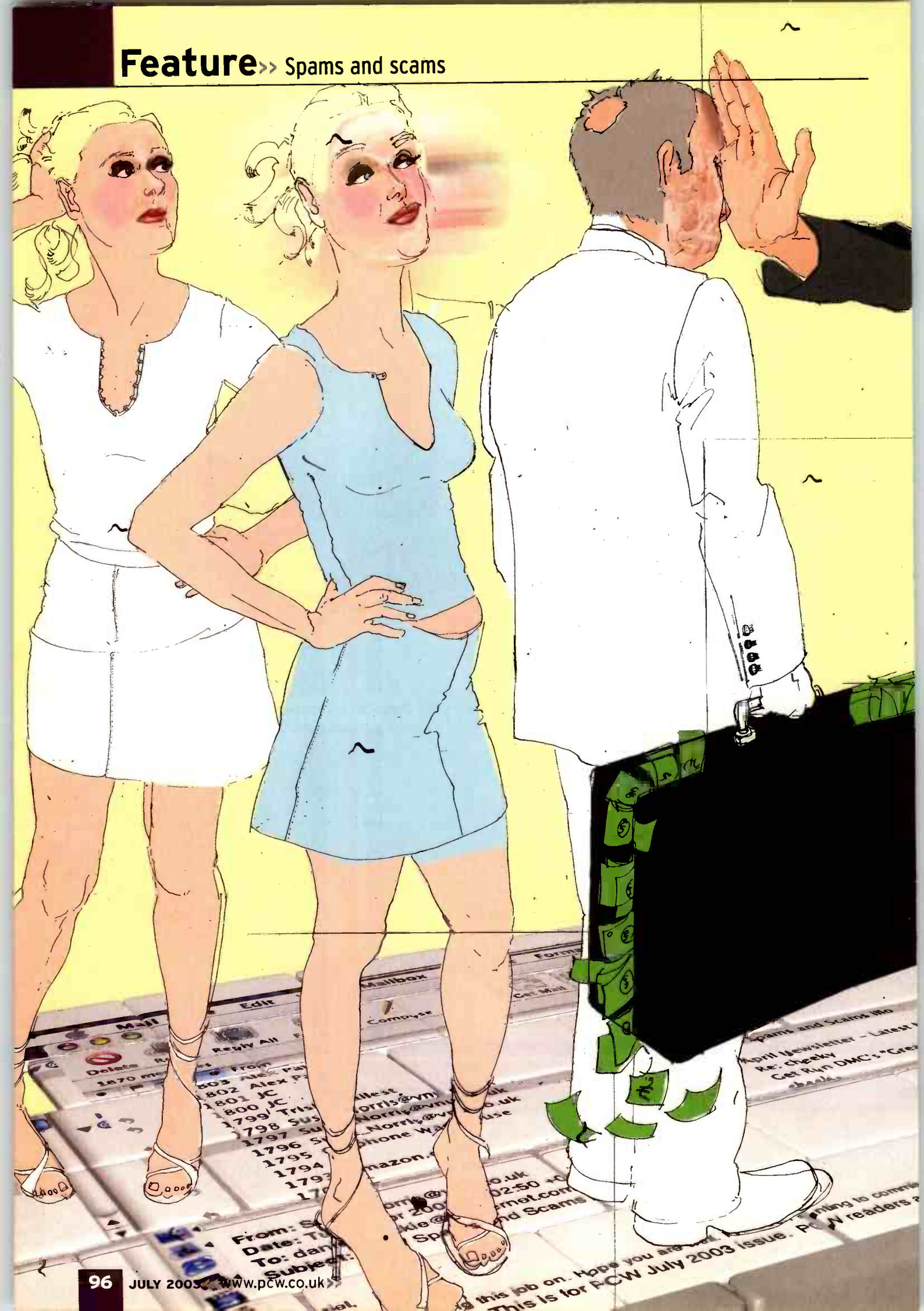
If you want your business documents to attract the attention they deserve, try printing them in colour with an HP Business Inkjet 3000 printer. Whether you're printing a background heading in red or highlighting your positive earnings in green, HP colour makes a powerful statement that cannot be ignored.

To find out how to exercise the power of HP colour in your business documents, visit [www.hp.com/uk/colour](http://www.hp.com/uk/colour)



invent





# Battle of the bilge

WORDS: NIGEL WHITFIELD ILLUSTRATION: DANIEL MACKIE

We're all fighting the frontline battle against that daily influx of bilge in our email inboxes. We tell you how to regain control

**E**mail is one of the most useful tools that net users have available to them. While the web may be more glamorous, email has always been the workhorse, the way people arrange meetings, make contacts and keep up-to-date with others.

How is it, then, that more and more of us find that, instead of using it as the great social or business tool it's become, we spend almost as much time sifting through the unsolicited crud in our mailboxes, offering Viagra, body enhancements, cheap mortgages or the opportunity to assist third-world money launderers?

From a small trickle a few years ago, the volume of unsolicited email has grown exponentially, and some researchers now believe that each of us spends many minutes every day filtering out unwanted messages.

There are a few people who can proudly boast that they've never received junk email – but it's only a few. The rest of us have had to put up with an ever-increasing tide of bilge, sent by people who believe they have a divine right to waste our time and phone bills. Since the cost of sending an email to one person is much the same as that of sending it to thousands, it's a very attractive option for

those who feel they have a message to get across. A whole mass-mailing industry has grown up, with a range of products designed to make it simple for fools to send bulk email to tens of thousands of addresses in a very short time, along with companion products such as lists of 'valid' email addresses – which will almost certainly include your address. And to complicate things more, there are companies attempting to use email marketing responsibly, often falling foul of the dislike of junk messages. Regulation is very hard, with senders and recipients often in different countries, so what can you do?

There's an increasing number of tools available to help work out which email is necessary and which is junk. You can allow only email from specific people to reach you, you can use a confirmation-based system or employ automatic filtering – at prices that can vary from free to several pounds per month per mailbox.

And there are plenty of tips and tricks you can use to try and cut down on the number of people who can figure out your email address and use it to send you junk. So, read on, and find out how you can take back control of your inbox from the spammers, scammers and other low-lives.





Assuming you're an innocent newcomer to the net, what sort of things can you expect to find in your inbox? The variety is astonishing – and often verging on lewd. Alongside weight loss programmes of dubious efficacy you'll find plenty of offers regarding Viagra, enlargement of body parts or promotion of some of the less savoury adult sites on the net.

Then there are offers of mortgage deals or loan consolidation – very often from foreign companies that don't even bother to check whether or not they're sending email to people they could do business with. And why should they after all, when the recipients bear most of the cost for collecting messages?

And as well as the straightforward spams, there are the scams too. While you might think that most of these are so obvious that any fool can see through them, some are rather more clever, and can take in even the most net savvy user.

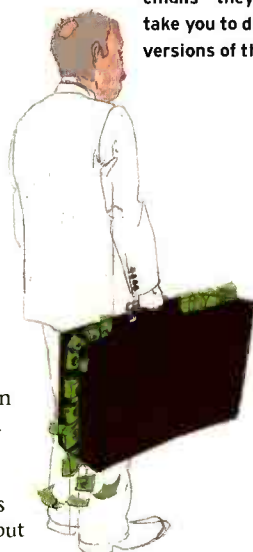
Amongst these are scams that have recently been used to target users of sites such as Ebay, Paypal and Nochex. The most common form is an email that appears legitimate, asking you to update your stored personal details and offering a link to do so. Usually, claims are made that you've been picked for a random security check, or that there's been some sort of computer failure that necessitates entering your information again.

Clicking the link takes you to a dummy website with a look and feel very much the same as that of the target. So, lulled into a false sense of security, you fill in all the requested information. Needless to say, all the information you type in will be used for something else, and the first you may notice is the unauthorised charges on your credit card.

There is one type of scam though, which seems so transparent it's a wonder anyone is taken in – but they are, with depressing regularity. Commonly known as the Nigerian 419 scam, and also as an advance



A popular email scam is to pretend to be from a well-known site like Ebay or Paypal, requesting all your account details. Never use the links in such emails – they may take you to dummy versions of the site



## Dos and don'ts

- Always use a disposable address for postings in online forums like newsgroups, chatrooms and message boards. You can abandon it if it gets too spam-filled, and give genuine correspondents your real address.
- If you want to provide email contact on your website, use a script to allow form-based emails, or create a graphic with your address in it – don't put the address in the text or use mailto links.
- Never reply to a junk email, or click the Unsubscribe links. If your mailer has a Bounce option, use that to reject the message and consider reporting it via Spamcop.
- When you sign up on a website, check carefully to make sure if you have to opt-in or opt-out of receiving email – it's not always clear. And consider using a unique address for each site, if you can.
- If you manage your own mail servers, consider installing software like Spamassassin, using Spews filtering or signing up for a service like MessageLabs mail filtering – the cost will be repaid in time saved by your users.
- If you run your own business, make sure you genuinely have the consent of customers before sending them email – assuming you have their implied consent is likely to cause you more problems than directly seeking it.

free fraud, these make claims about lost fortunes, and a desire to find someone who can help ship it out of a country, in return for a split. Originally a postal scam operated from Nigeria, variations on these now crop up from all over the globe, including some topical Iraq-based ones.

All you have to do is pay a certain amount up front, supposedly for bribes, and a large portion of the money will then be yours. Why you? Often, money might have belonged once to someone with your surname, or some other tenuous connection will be claimed. Sometimes there's no pretence – it's an invitation to take part in a fraud, and if your greed gets the better of you, please don't write to PCW about how unfair it all was.

## Why me?

One of the questions you'll probably ask yourself as you sift through the junk in your inbox is 'Why me?' You may do so with a certain amount of trepidation if you've just received an email advertising 'sexy underage Lolitas'. Does someone have you down on a list of people interested in such things? Is a knock on the door from the police not far away?

Fortunately, in most cases, the answer is no; the email lists used are very often indiscriminate, and those selling them guarantee little more than that the addresses work. Addresses are culled from lots of different sources.

Ever posted a message to a Usenet discussion group or a mailing list that's archived on the web and consequently available via Google? Do you have a web page? Have you ever been in a chatroom or have been a little incautious when signing up for websites and not checked their privacy terms to see what they'll do with your email address?

Those are all the obvious and easy ways for someone to find out your email address; but there are plenty of others. If you're a member of a professional association, they may have a directory on the web – and if that's searchable, it can probably be manipulated with a script to extract the email addresses of all the members. Websites can be searched easily by robots, which will look for the mailto links, or addresses in the text of the page, and extract addresses from them.

But what if you've never ever posted anything anywhere, never put your email address on a web page and never signed up for anything, and you're still receiving junk email? You can still become a target via what's called a 'dictionary attack'. If there are enough users in a big domain – like AOL or Hotmail – then there's a good chance that most of the common names and words in the language will be valid email addresses. You can extend it, too, by putting two words together, or a name and an initial, like jsmith or perhaps a year; all the spammer has to do is try it once, see which addresses are rejected, and the rest are worth sending things to in future.

## Stopping the flow

So now you know how people can get your address, what can you do to stop it and get your inbox back under control? First things first – the bad news is that if your address is on lots of lists then your best solution may be to accept that you need to change your address, and try hard to keep the new one junk free. If you don't do that, you can still cut down on the junk, but it's a lot easier if you start with a clean slate.

If you want to take part in discussions on the net, whether in chatrooms, message boards or Usenet groups, it's worth creating a new ID to use just for that; you could sign up with Hotmail or, depending on your ISP, simply create a new account on your computer.

You can also obscure your address by amending it when you post to online forums; you'll often see addresses like



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Computer Shopper, Mar 2002

"NetHighStreet.Com systems prove that when it comes to style and performance, you can have your cake and eat it"

Computer Shopper - Aug 2002

"it's just so much faster than any other machine"

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"If you're a speed freak on a budget, this PC is for you"

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"Solid performance and excellent component quality throughout"

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"The build quality is high, while accessibility for upgrades is excellent"

Computer Shopper - June 2002



	Home PC	Pro PC	Evo PC	Elite PC	CUBE PC
Motherboard	ASUS A7N266-VM	Gigabyte GA7VA	Gigabyte 8PE667	MSI K7NZ, NFORCE2	
Memory	256 MB DDR PC2100	256 MB DDR PC2100	256 MB DDR PC2100	512 MB (2 x 256MB) DDR PC2700	256MB PC2100 DDR
Hard Drive	40 GB UDMA 100 7200 RPM	40 GB UDMA 100 7200 RPM	40 GB UDMA 100 7200 RPM	80 GB UDMA 100 7200 RPM	40GB 7200RPM HDD
Graphics	GeForce2 Graphics (nForce Chipset)	64MB GeForce4 MX440, TV-OUT	64MB GeForce4 MX440, TV-OUT	128MB GeForce4 Ti4200, 8x,TV-OUT, DVI	3D Graphics, TV OUT
Multimedia	16x DVD-ROM Drive	16x DVD-ROM Drive	16x DVD-ROM Drive	16x DVD-ROM Drive	6 Channel Sound
CD-RW	Option Available	48x24x48 CD-ReWriter (BurnProof)	48x24x48 CD-ReWriter (BurnProof)	48x24x48 CD-ReWriter (BurnProof)	16x DVD-ROM and 48x CD-RW COMBO Drive
Sound	Dolb Digital Sound O/B	6 Channel Sound	6 Channel Sound	6 Channel Sound	3.5" Floppy Drive
Modem	56K v.92 Modem & 10/100 Network Card	56K v.92 Modem	56K v.92 Modem	56K v.92 Modem	10/100 Network Card
Monitor	17" SVGA Colour Monitor	17" SVGA Colour Monitor	17" SVGA Colour Monitor	17" SVGA Colour Monitor	4 USB2.0 Ports
Speakers	Desktop Speakers Keyboard & Mouse	Subwoofer & 2 Satellites Keyboard & Mouse	Subwoofer & 2 Satellites Keyboard & Mouse	Creative 5.1 Inspire 5300 Keyboard & Mouse	2 1394 Firewire Ports
Extras	4 USB Ports 3.5" Floppy Disk Drive	6 USB (4 USB2.0) Ports 3.5" Floppy Disk Drive	6 USB (4 USB2.0) Ports 3.5" Floppy Disk Drive	6 USB (4 USB2.0) Ports 3.5" Floppy Disk Drive	
Warranty	12 Months RTB Warranty	12 Months RTB Warranty	12 Months RTB Warranty	12 Months RTB Warranty	
	<b>AMD Athlon 2000+XP</b> £375 inc.VAT	<b>AMD Athlon 2000+XP</b> £475 inc.VAT	<b>Pentium 4 2.53GHz</b> £575 inc.VAT	<b>AMD Athlon 2600+XP</b> £710 inc.VAT	<b>AMD Athlon 2400+XP</b> £440 inc.VAT
		<b>AMD Athlon 2400+XP</b> £500 inc.VAT	<b>Pentium 4 2.66GHz</b> £630 inc.VAT	<b>AMD Athlon 2800+XP</b> £770 inc.VAT	<b>Pentium 4 2.4GHz</b> £535 inc.VAT

## SYSTEM UPGRADES

- Upgd to 15" Samsung TFT **£135**
- Upgd to 17" Samsung TFT **£270**
- Upgd 256MB to 512MB DDR **£30**
- Upgd 40GB to 80GB (7200 PRM) **£16**
- Upgd MX440 to GF4 Ti4200, 128MB **£75**
- Upgd MX440 to ATI 9700 PRO, 128MB **£210**
- Add Windows XP-Home **£70**
- For other upgrades visit website



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## NOTEBOOK UPGRADES

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- Upgrade 256MB to 512MB DDR **£30**
- Upgd 20GB to 30GB Hard Drive **£12**
- Upgd 20GB to 40GB Hard Drive **£32**
- Add Windows XP-Home **£70**
- Add Carry Case **£18**

Pro Book	Evo Book	Elite Book
<ul style="list-style-type: none"> <li>● 14.1" XGA TFT Colour Screen</li> <li>● 256MB DDR Memory</li> <li>● 20GB Hard Drive</li> <li>● DVD-ROM Drive</li> <li>● 56k Fax Modem</li> <li>● 10/100 LAN Card</li> <li>● 8MB to 64MB Shared Graphics</li> <li>● IEEE1394 Firewire</li> <li>● 2 USB2.0 Ports</li> <li>● PCMCIA Type II Slot</li> <li>● 3.5" Floppy Drive</li> <li>● Infra Red Port</li> <li>● TV OUT Port, Smart Li-Ion Battery</li> <li>● 12 Months RTB Warranty</li> </ul>	<ul style="list-style-type: none"> <li>● 15" XGA TFT Colour Screen</li> <li>● 256MB DDR Memory</li> <li>● 20GB Hard Drive</li> <li>● DVD-ROM Drive</li> <li>● 56k Fax Modem</li> <li>● 10/100 LAN Card</li> <li>● 8MB to 64MB Shared Graphics</li> <li>● IEEE1394 Firewire</li> <li>● 2 USB2.0 Ports</li> <li>● PCMCIA Type II Slot</li> <li>● 3.5" Floppy Drive</li> <li>● Infra Red Port</li> <li>● TV OUT Port, Smart Li-Ion Battery</li> <li>● 12 Months RTB Warranty</li> </ul>	<ul style="list-style-type: none"> <li>● 15" SXGA TFT Colour Screen</li> <li>● 256MB DDR Memory</li> <li>● 20GB Hard Drive</li> <li>● DVD-ROM &amp; CD-Rewriter COMBO</li> <li>● 56k Fax Modem</li> <li>● 10/100 LAN Card</li> <li>● ATI M9 Radeon Graphics</li> <li>● IEEE1394 Firewire</li> <li>● 4 USB2.0 Ports</li> <li>● PCMCIA Type II Slot</li> <li>● Infra Red Port</li> <li>● TV OUT Port, Smart Li-Ion Battery</li> <li>● 12 Months RTB Warranty</li> </ul>
<b>Intel Celeron 1.7GHz</b> £675 inc.VAT	<b>Pentium 4 2.4GHz</b> £800 inc.VAT	<b>Pentium 4 2.53GHz</b> £980 inc.VAT
<b>Pentium 4 2.4GHz</b> £750 inc.VAT	<b>Pentium 4 2.53GHz</b> £820 inc.VAT	<b>Pentium 4 2.66GHz</b> £1030 inc.VAT



Mac OS X users get junk mail filtering built in to the standard Mail program – but you need to train it a little first

fred@NOSPAMfredspc.co.uk – most people realise that they need to remove 'NOSPAM' when they use the address. While that will cut back some junk, it won't repel all of it, since character strings like 'NOSPAM' are a fairly simple thing to search and replace – you may wish to be more creative.

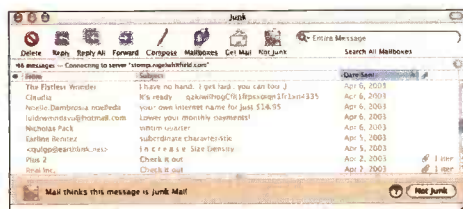
And while it can be useful to have a 'Mail me' button, or to put your address there, it's also an invitation to have your address grabbed, both by spammers and by some viruses. Consider creating a graphic with your email address spelled out in the graphic and then use that in place of text – that way it won't be readable by robots. And instead of a mailto link for people who want to contact you, consider providing a contact form that can send you an email without divulging it to the web browser.

Sometimes, of course, you have to give your email address to people, often as a condition of signing up for something. In that case, if you can create additional addresses with your account, it's often worth doing so – that way you can work out who's passed your address on. For example, if you signed up for something on the Acme website, you might create a special address like Nigel.acme@your-isp.co.uk.

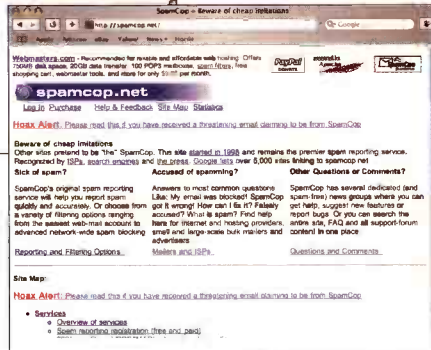
## Filtering it out

Of course, this sort of trick will help stop your address being spread about, but what about getting rid of the mail that's already being sent to you?

First rule of the road is: never reply. Even if they say that replying will take you off their list, don't – unless it's a reputable UK company or someone else you've already done business with. More likely, such links and reply addresses will just confirm that your address works. If



Mail thinks this message is junk Mail  
From: Jacques Arnaud [mailto:jacques.arnaud@orange.fr]  
Sent: Tue Aug 12, 2003 07:23:23 CEST  
Subject: Welcome back??  
Attachments: There is 1 attachment



Spamcop provides filtered email, real-time blacklists and a method of reporting spam, to help stop it in its tracks

your email program provides such a facility, bounce the message back to the sender, so that it looks invalid.

The next thing to do is to spot them when they hit your inbox. Sometimes that's easy – anything with words like Viagra, enlarge or Lolita is likely to be junk. Sadly though, there's a lot of spam that uses subjects like 'Re: last night' or 'Hey there' to try and make you think it's a part of an ordinary email exchange. Look out too for random number or characters in subjects, which can be a kind of code so people know who has responded to which email. Claims that a message has been sent in accordance with a particular piece of legislation, or that it's not spam, almost certainly mean that it is.

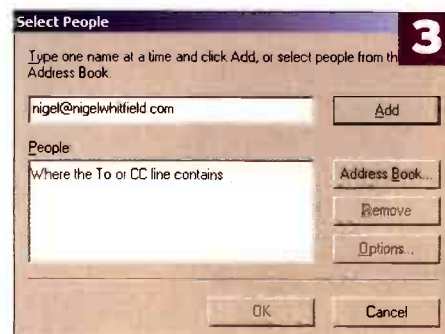
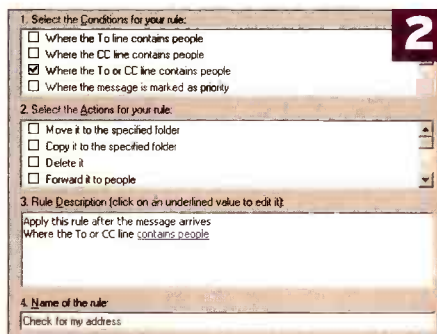
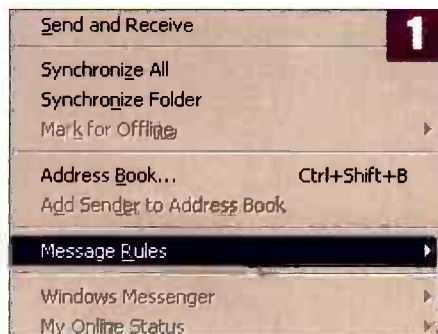
It's this kind of more detailed analysis that automatic spam filters use, and some of them claim accuracy rates of over 90 per cent – but that means there's a 10 per cent chance of mis-identification, which can include real mail being erroneously flagged as unsolicited and either tagged as such or rejected. Some mail programs, like the Mac OS X Mail client, include filtering too, which you can train and then leave to filter junk – but as with all training systems, it's advisable to check the results from time to time.

There is a wide range of solutions you can use, including software on your own PC, or choosing an email provider that uses their own or third party filters, like Brightmail or Messagelabs. You can add Messagelabs services to a corporate email system, and at a few pounds a month per mailbox it will probably pay for itself in time saved. It's also worth considering packages like Mailwasher ([www.firetrust.com](http://www.firetrust.com)) to help filter and reject messages, or Spamcop (<http://spamcop.net>), which will collect messages from your mailbox and filter them into a new mailbox on their server for \$30 (£19 approx) per year.

You can also use databases from organisations like Spews ([www.spews.org](http://www.spews.org)); these provide lists of known spammers, the companies and ISPs that support them, and the open relays (insecure systems used to pass spam through) that they use. Spews also tracks dialup



## Mail filtering with Outlook Express



With most email programs, you can use filters or rules to automatically sort your messages into different folders. Here we're using Outlook Express 6 (OE) to do this. To get started, choose Message Rules from the Tools menu, and then select Mail. OE won't filter mail in Imap accounts, but other programs, like Eudora or Mac OS X Mail will.

You can't choose a negative condition in OE, which makes this procedure a bit fiddly. If this screen doesn't appear automatically, click New from the rules summary. Give the rule a name like 'Check for my address' (section 4) and tick 'Where the to or cc line contains people' (section 1), then click on the word people, which will be underlined (section 3).

This brings up the Select People dialogue box. We want to look for mail that's properly addressed to us, so our own email address goes in the top textbox here, then click on Add, and return to the previous screen. You can have more than one address if you like, so you could include other email addresses, or aliases that you use.

## >>> Acer TravelMate C100 Tablet PC

The TravelMate C100 series brings a whole new dimension to ultraportable mobile computing. Mobile professionals spend a great deal of time away from their workspaces, organizing formal meetings, business trips and casual discussions with colleagues. Having the right tool is essential to stay ahead in this uncompromising world. The integrated solutions of the TravelMate C100 series and its unique capabilities including digital ink, handwriting character recognition, Windows Journal, note-taking utility, and the sticky notes utility allowing users to jot down short notes and place them anywhere on the desktop provides the perfect solution to ultra-mobile, outbound computing.

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#### TravelMate C102Ti

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Mobile Intel® Pentium® III - M processor at 800MHz, 256MB SDRAM, 30GB HDD, External CD-ROM, 10.4" TFT with Digitised overlay, Modem, Wired/Wireless Lan, SmartCard, EMR Stylus Pen, Microsoft® Windows® XP Tablet PC Edition

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Mobile Intel® Pentium® III - M processor at 800MHz, 256MB SDRAM, 30GB HDD, CD-RW & DVD, 10.4" TFT with Digitised overlay, Modem, Wired/Wireless Lan, SmartCard, EMR Stylus Pen, Microsoft® Windows® XP Tablet PC Edition



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### Standard specifications include:

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- Li-Ion battery
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- Microsoft® Windows® XP Home Edition
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Microsoft® Windows® XP Home Edition

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# >>> Acer TravelMate 230 series

## Mobility Creates Communication

### Standard specifications include:

- Mobile Intel® Celeron® Processor up to 2.00GHz
- Built-in 10/100 ethernet and 56kb/s V.90 modem
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- 14" or 15" display options.\*
- 256MB DDR RAM
- 20 GB/ 30GB Hard Disk drive
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24x CD-ROM, 8x DVD-ROM or  
8/4/24/8x DVD-ROM/CD-RW Combo drive\*
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1 year International Travellers Warranty



Acer recommends Microsoft® Windows® XP.

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£639 EX VAT

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256MB DDR, 24x (MAX) CD-ROM, Modem/Lan  
Microsoft® Windows® XP Professional

### TravelMate 230XC

**£869** INC VAT

£739 EX VAT

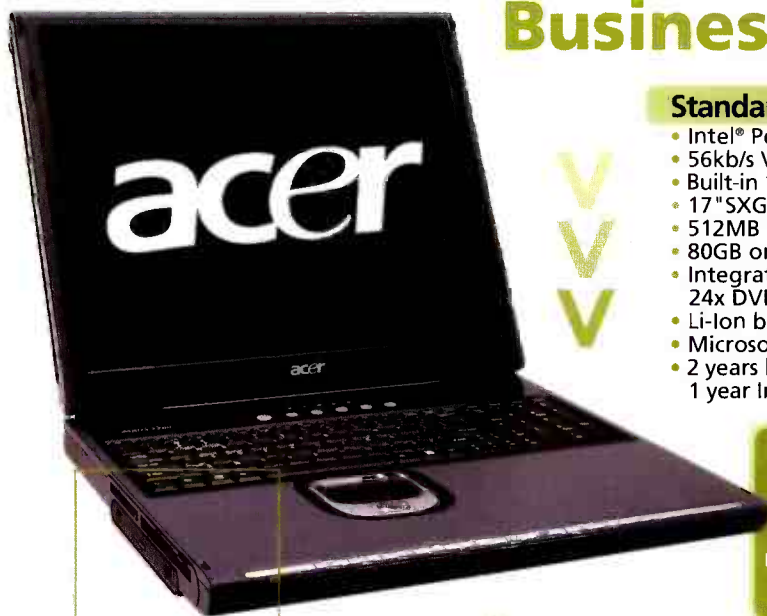
Mobile Intel® Celeron® Processor at 1.70GHz, 14.1" TFT, 30GB HDD,  
256MB DDR, 8/4/24/8x CD-RW+DVD Combo Drive, Modem/Lan  
Microsoft® Windows® XP Professional

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# >> Acer Aspire 1700

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### Standard specifications include:

- Intel® Pentium® 4 Processor 3.06GHz
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- Built-in 10/100 ethernet LAN or Wired & wireless LAN.\*
- 17" SXGA Display
- 512MB DDR RAM (upgradeable to 1GB)
- 80GB or 120GB Ultra ATA-100 Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive,
- 24x DVD/CD-RW Combo drive\*
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- Microsoft® Windows® XP Home Edition
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- Resolution 1280 x 1024
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- w/Speaker
- Warranty 3 years
- ISO 13406-2 certified

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- Super Slim Format
- VESA Wall Mounting Supported
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- ISO 13406-2 certified

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- Brightness 260 cd/m²
- Contrast Ratio 450:1
- Viewing angle 160°
- Response time 16ms
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- Multimedia Speaker 1W x2
- 100% Silver Aluminium
- Super Slim Format
- Warranty 3 years
- ISO 13406-2 certified

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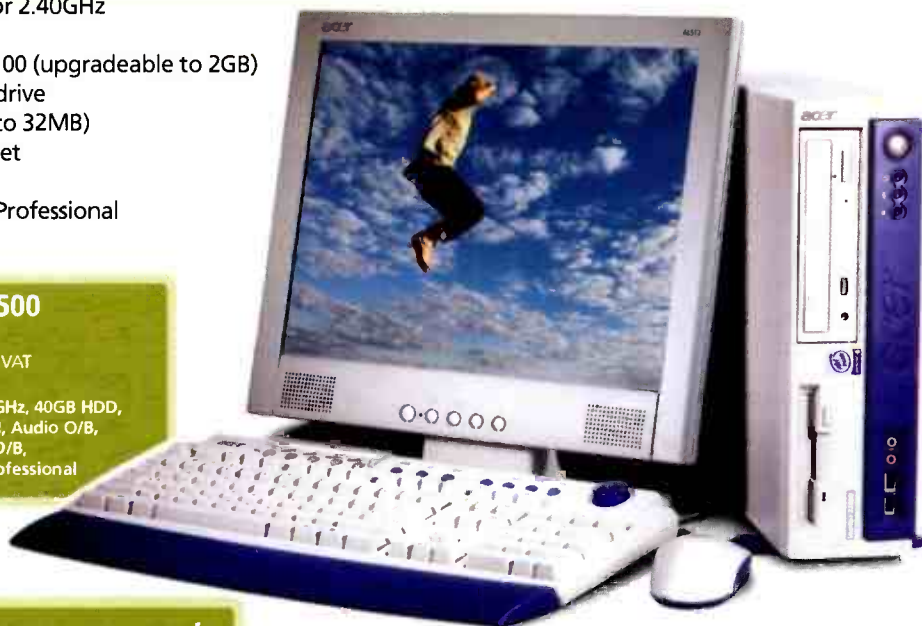
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### Innovative Convenience for Improved Office Productivity

#### Standard specifications include:

- Intel® Pentium® 4 Processor 2.40GHz with Intel® 845GL chipset
- 256MB DDR SDRAM PC2100 (upgradeable to 2GB)
- 40GB ATA-100 Hard Disk drive
- Integrated Graphics (Up to 32MB)
- Integrated 10/100 ethernet
- 52x CD-ROM drive
- Microsoft® Windows® XP Professional
- Modem Options

\*Monitor Optional



#### Acer Veriton 3500

**£727** INC VAT  
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Intel® Pentium® 4 Processor at 2.40GHz, 40GB HDD,  
256MB DDR RAM, 52x CD-ROM, Audio O/B,  
LAN O/B, 32MB VGA O/B,  
Microsoft® Windows® XP Professional

**FREE Upgrade to 3 years warranty**

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- 256MB DDR SDRAM PC2100 (upgradeable to 2GB)
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- Integrated Graphics (Up to 32MB)
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- Modem Options

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**£704** INC VAT  
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LAN O/B, 32MB VGA O/B,  
Microsoft® Windows® XP Professional

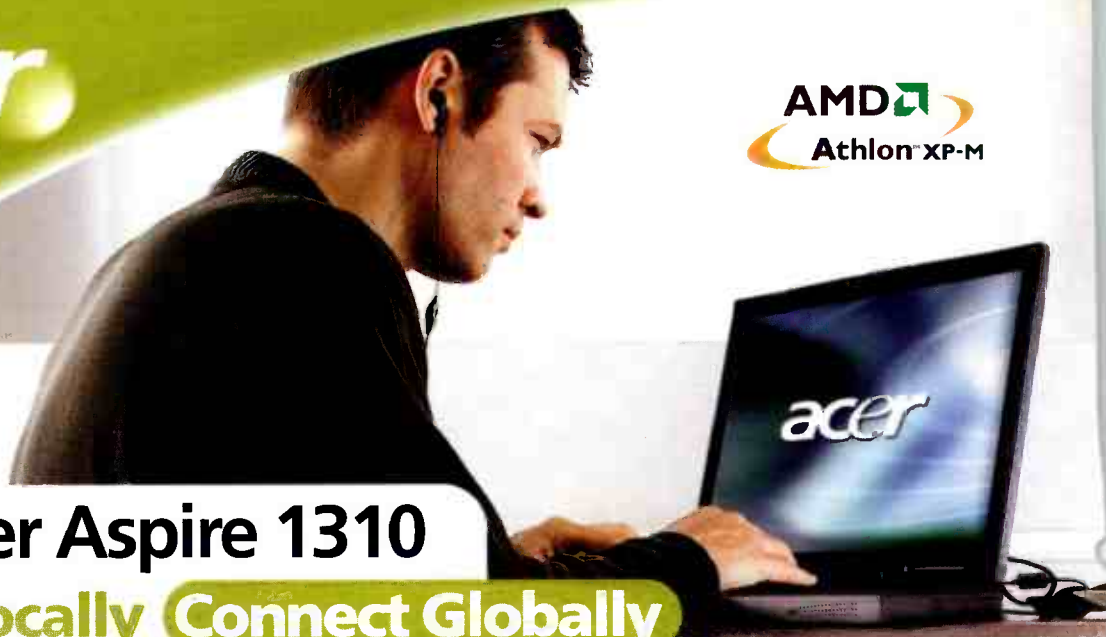
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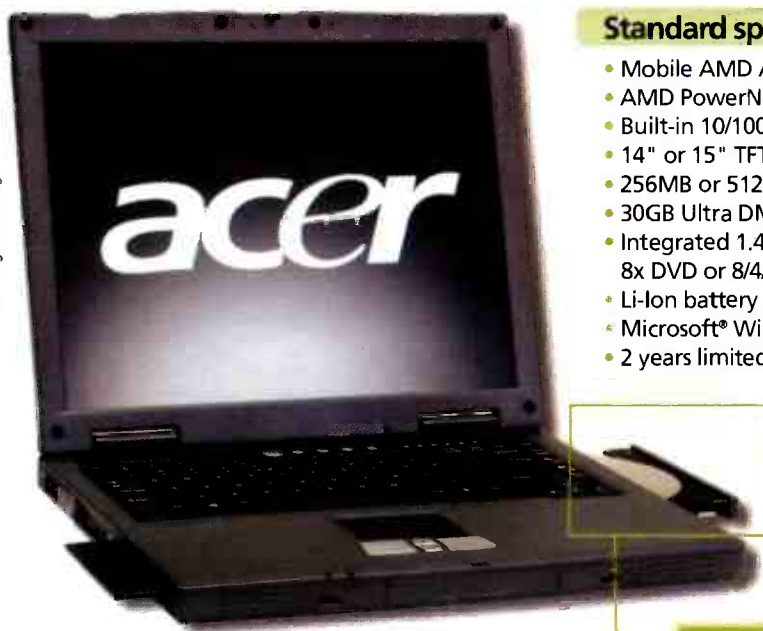
AMD  
Athlon™ XP-M



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#### Standard specifications include:

- Mobile AMD Athlon™ XP processor up to 2200+
- AMD PowerNow!™ technology
- Built-in 10/100 ethernet and 56kb/s V.90 modem
- 14" or 15" TFT Display Options
- 256MB or 512MB RAM (upgradeable to 1GB)\*
- 30GB Ultra DMA-100 Hard Disk drive
- Integrated 1.44MB, 3.5" Floppy Disk drive, 24x CD-ROM, 8x DVD or 8x/24x/8x DVD-ROM/CD-RW Combo drive\*
- Li-Ion battery with average 2.5 hours battery life
- Microsoft® Windows® XP Home Edition
- 2 years limited warranty, 1 year International Travellers Warranty

#### Acer Aspire 1312LC

**£938** INC VAT

£799 EX VAT

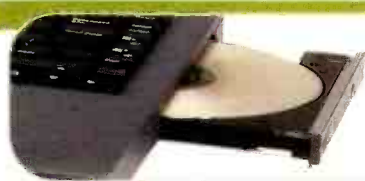
Mobile AMD Athlon™ XP processor 2000+, 15" TFT, 2x256MB, 30GB HDD, 8x/24x/8x DVD/CDRW Combo, Li-Ion, Modem/Lan, Microsoft® Windows® XP Home Edition

#### Acer Aspire 1310XC

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Mobile AMD Athlon™ XP processor 1800+, 256MB, 30GB HDD, 14" TFT, 8x/4x/24x/8x DVD/CDRW Combo, Li-Ion, Modem/Lan, Microsoft® Windows® XP Home Edition



Acer recommends Microsoft® Windows® XP.

Pricing Effective From 4th June, 2003 til 4th July, 2003.

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AMD  
Athlon™ XP

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- AMD Athlon™ XP Processor 2400+
- 256MB DDR SDRAM
- 80GB ATA-100 HDD
- ATI 9000 64MB VGA
- Integrated 10/100 ethernet
- DVD & CD-RW
- 56K Modem, 10/100 LAN
- Audio O/B
- Microsoft® Windows® XP Home
- 2 years warranty

### Acer Aspire G500

**£663** INC VAT

£565 EX VAT

AMD Athlon™ XP Processor 2400+, 80GB ATA-100 HDD, 256MB DDR-Ram, DVD & CD-RW, Audio O/B, ATI 9000 64MB VGA, Modem/LAN, Worksuite 2003, Speakers & Sub Woofer, Microsoft® Windows® XP Home

\*Monitor, wireless keyboard and mouse are not included

Acer recommends Microsoft® Windows® XP.

### AL506 - Sound and Vision

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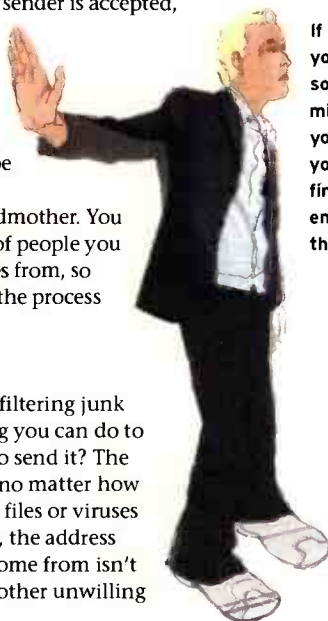
**Spews provides extensive databases, allowing you to block known spammers from sending mail through or to your servers, dramatically cutting down on the volume of junk you receive**

connections, also often used to send spam. By using these databases of offenders, instead of filtering mail when it reaches your mail box, any attempt to connect to your server will be rejected before the mail is sent, if it comes from a 'bad' source. If you run – or could run – your own mail server, such a solution can be one of the most effective. Even if you don't, you can use these databases with Windows tools such as Spampal ([www.spampal.org](http://www.spampal.org)), to tag suspected spam as it's downloaded from your ISP's mail server.

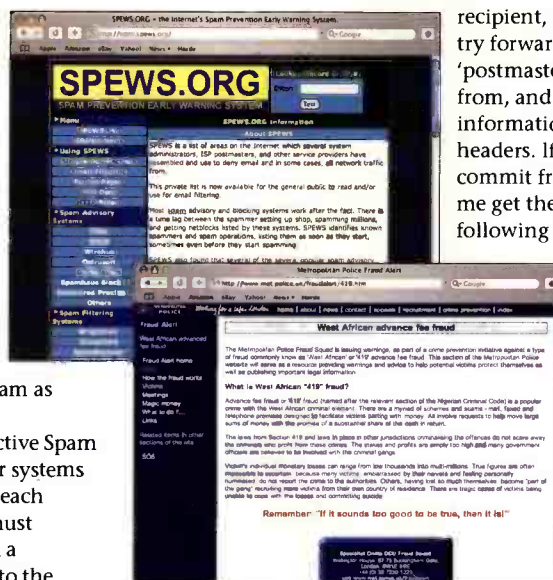
Yet another alternative is to use a system like Active Spam Killer ([www.paganini.net/ask](http://www.paganini.net/ask)) or one of the similar systems available on the net. Essentially, these respond to each piece of incoming mail with a reply that people must acknowledge in some way, either by sending back a code displayed on a web page, or just by replying to the message. Once that's done, the sender is accepted, and further messages from them pass through to your inbox unobstructed. Most spammers don't have the time or inclination to respond to such requests – but it can also be confusing for some legitimate correspondents, like your grandmother. You can usually create a 'whitelist' of people you always want to receive messages from, so they don't have to go through the process when they contact you.

## Fighting back

So far, we've looked at ways of filtering junk email out, but is there anything you can do to get back at the selfish fools who send it? The most important lesson is that, no matter how tempting it is, don't send huge files or viruses back to the sender – very often, the address that a junk email purports to come from isn't real – it's likely to belong to another unwilling



**If someone offers you a share of some African millions, don't let your greed take you in. You can find out about email fraud on the Met's website**



recipient, or to be completely forged. You can try forwarding the junk back to 'abuse' or 'postmaster' at the domain the email came from, and they'll be able to track down information by looking at the message headers. If the email is an incitement to commit fraud, along the lines of 'please help me get these millions out of the country following the tragic death of someone with a

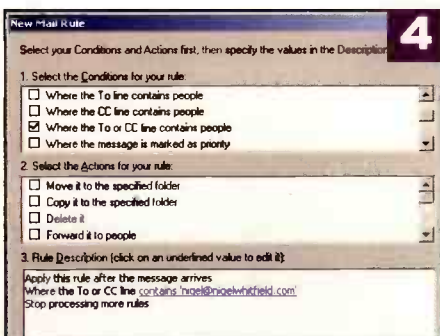
surname spookily similar to yours,' check the Metropolitan Police website at [www.met.police.uk/fraudalert](http://www.met.police.uk/fraudalert).

For the time being, the only types of junk email that the police are able to deal with are fraud and child pornography – but that may change. Already, some states in the US prohibit the sending of junk email to their residents, and there have been some successful prosecutions, though nowhere near enough to make a difference.

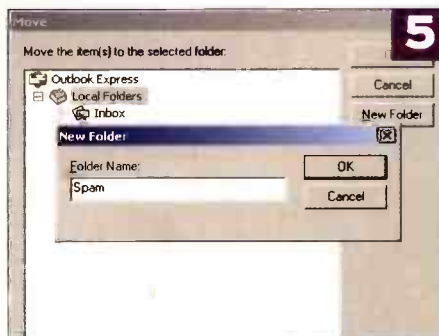
And while the EU is intending to introduce controls that will make much junk email illegal – only people who have opted in will be legitimate recipients, and that won't stop people from outside the area sending email in.

The best response for many people is to help report spammers, either via email if you can work out where it was sent from, or via websites. For example, the Spamcop website has a reporting system which feeds directly into its real-time blacklist, ensuring that once a sending host is listed, people using the black list won't receive any more spam from it. At the Mail Abuse Prevention System ([www.mail-abuse.org](http://www.mail-abuse.org)), you can find plenty of other tools to help you track down the senders.

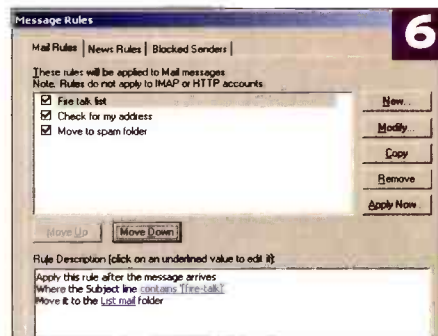
But for most people, we reckon the solution is to use some of the tools we've looked at earlier. If you can, choose an email provider that offers filtering and tagging of messages. If not, pick a tool like Mailwasher or Spampal to clean up your mailbox for you. At the very least, set up filters in your mail program to move the email you care about into one place, and leave everything else in a folder of its own to look at another time. Above all, no matter how tempting the offers you receive – don't reply!



Now we need an action for this rule, which you specify in the second section of the screen. Here it should be 'Stop processing more rules,' so when you've gone down the list and ticked this option, this is the description of the rule that will appear in section 3. OK this rule to save it. Now we need to create another rule to deal with all other mail.



For the next rule, choose All mail in the top pane, and for the action, choose to transfer to a folder. If you don't have a suitable one, click the New folder button on this screen, and create a folder called Spam, as above. Now all the mail that hasn't been sent to the email address specified in the previous rule will end up in a spam folder.



Make sure you keep these two rules, in order, as the last ones. Add other rules, such as for mailing lists, above them to filter out other mail. Now real mail will stay in your inbox, and some spam will get filtered out – but not any addressed to you personally. You can use Outlook's Blocked Senders facility to stop some of that.





# The power to protect

WORDS: SCOTT COLVEY ILLUSTRATION: DAVID ANGEL

If you think your PC is safe, think again. From thieves to power surges, we tell you what you need to know to protect expensive hardware and keep your valuable data from prying eyes

**N**ational and specialist press regularly remind computer users of the danger posed to their equipment and vital data by electronic terrors, like viruses and hack attacks. However, fending off foes online is only one front in the PC-protection battle. If you want to be confident of having all bases covered then you need to consider physical fortifications too.

Perhaps the most devastating event that could befall a computer owner is theft of equipment. Of course, virus infections and hacker activities can result in damaged or even deleted files and documents, but while such situations can be seriously debilitating, important data might be recoverable. In contrast, data stored on a hard disk of a computer that's been stolen is irretrievable.

However, there are numerous less obvious threats facing computer users. Take power cuts, for example: these might be uncommon events these days, but that will come as little compensation should your locale be hit by an electrical outage while your PC is midway through a critical operation. A loss of juice during a hard disk defragmentation or repartitioning process could result in serious difficulties.

Talking of problems in the electricity supply, it's not just power cuts that can cause problems for computers. Domestic ring-main circuits regularly suffer electrical aberrations – surges or spikes – which can be disastrous. A sudden surge of power travelling up the mains could literally explode connected equipment.

We've already noted the danger posed by the dastardly denizens of the online world but many people strive to protect their PCs against these virtual assaults while ignoring closer-to-home threats. In an open-plan office your sensitive data is prone to prying eyes whenever you leave your desk. During those unguarded moments, someone could sidle up to your computer and rifle through private folders and files.

In short, defending against all potential hazards requires more than the installation of anti-virus and firewall programs. Whether you operate a one-person business from the domestic confines of a spare bedroom, or manage an open-plan office with dozens of PC workstations, our guide will show you how to protect your computer equipment.





## Get wired

PCs and premium peripherals, like flat-panel monitors and external DVD writer drives, are valuable items. It's no wonder, then, that they're prime targets for the light-fingered. An effective way to protect costly components against larcenous types is, quite simply, to lock them away. When not in use, a notebook PC can be locked in a combination safe or padlocked cabinet.

Obviously, this approach is unlikely to be favoured by owners of large desktop machines. Besides, concealing even the most portable equipment is likely to prove inconvenient in everyday life: is it likely that you'll go to the effort of locking away your notebook computer each time you go out for a coffee?

Fortunately, there are a variety of less bothersome options. A notebook owner, for instance, might choose to apply a ball-and-chain-style solution to secure their expensive technological slab. The vast majority of modern notebook computers include a shackle socket, designed specifically for Kensington-branded security products.

The Kensington Notebook Microsaver, for instance, is a £30-device that employs a simple cable-loop system to anchor a portable PC to a desk leg, strut or similarly convenient immovable object. A key-locking mechanism enables quick release.

The Kensington system isn't just for notebook protection. The brand includes products designed to anchor a variety of computer components. For more information on the Kensington range, available from Acco Europe, call 01296 732466 or go to <http://uk.kensington-europe.com>.

## Box clever

While shackle systems are designed to deter opportunist crooks roaming around open plan offices, more seasoned burglars are likely to come on the prowl with cable cutting tools.

Fortunately, there are more secure alternatives, like the Lokblok Futura F1 Security Encasement from Safemark. This sturdy construction literally shields enclosed equipment from the outside world behind 3mm of steel.

Once bolted to the desk, the £207.09 (£176.25 ex VAT) Futura F1's heavy-duty locking bar ensures that only the computer's drives are accessible. Any thief wanting to make off with the computer within would need serious perseverance. For complete concealment, the more expensive

**The Kensington Notebook Microsaver can secure a PC to a desk, or other immobile object, to ensure it stays put**

£248.51 (£211.50 ex VAT) Futura F2 Security Encasement model forgoes the locking-bar mechanism in favour of a 6mm steel door. For more information call 01904 778899 or go to [www.safemark.co.uk](http://www.safemark.co.uk).

And there's more – Safemark offers an assortment of computer security products for other vulnerabilities. The Lokdisk Floppy Drive Lock, for instance, physically bars access to a PC's floppy disk slot, foiling anyone attempting to spirit files from a computer's hard drive when no-one's looking. Or, to protect against attempted invasions into a computer's innards, consider the Kerfuffle Ko. This high-decibel alarm plugs into a PC expansion slot and primes itself to emit its deafening shrill should the case be opened. Only insertion of the disarming key will silence the rechargeable battery-powered device.

## Feel the surge

An ever present threat to computer equipment is also one of the least appreciated – the electricity supply. Most of the time, domestic mains outlets hum along at around 230v, however, fluctuations in the supply can and do occur.

If your neighbour decides to fire up his arc-welding machine, this could lead to a momentary blip in the 'smoothness' of the power supply, as the local electricity sub-station adjusts its output to match the increased demand. Your experience of such a situation, as a computer user, could be an unexpected reboot due to your neighbour's high-powered flux-fusing endeavour, which could momentarily reduce the current flowing around your home's ring-main circuit – a localised 'brownout'.

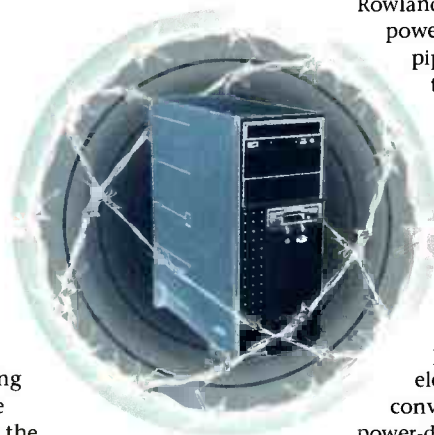
More serious are surges or spikes. In contrast to brownouts, where a brief reduction in the voltage can lead to annoyances like computer resets, power surges can be positively harmful. If the voltage should suddenly jump an order of magnitude beyond the UK's 230v supply standard, the upshot could be exploded computer components.

We asked Alan Rowlands, key customer relationship manager at East Midlands Electricity, a subsidiary of electricity generator Powergen, to explain why such surges happen. 'It's just the nature of the power supply infrastructure,' says Rowlands. 'The three-pin household main socket is a doorway into a vast network of overhead power lines and underground cables. An unexpected event affecting this network, like a lightning strike, say, or a bird flying into an overhead line, can lead to aberrations in the power supply to your home.'

## Under pressure

Rowlands says that a good analogy for the domestic power supply is to think of electricity as water piped under pressure: voltage is the 'pressure' that moves electricity along a cable, so if something like a lightning strike suddenly increases the pressure, then that can lead to a surge. Similarly, a snapped cable could lead to a sudden reduction in voltage.

The National Grid is exposed daily to unpredictable events like these, so how likely are you and your valuable equipment to be affected by surge? Alan Rowlands is circumspect in his response: 'It's difficult to be specific about power-surge incidences, because supply of electricity is not a precise art. If you live in a flat conversion and the person next door turns on a power-demanding device, then the voltage exiting your home's mains sockets might be affected by that. We call such events 'disturbing loads'.'



## Should you protect your peripherals?

When it comes to physically protecting peripherals, like scanners and printers, the equation to crunch is the outlay needed to shield ancillary equipment from harm against the cost of replacement or repair, and any inconvenience that might be caused during the reparation of particular items. £200 spent on a device like the Lokblok Futura F1 might be a worthwhile investment for protecting a PC from theft – if the alternative is the inability to operate a business or complete vital tasks in time – but it would be difficult to justify spending any sum shielding, say, an inkjet printer from an unforeseen foe, because the cost of replacing such a device is minimal.

Even so, there are instances when even low-cost peripherals are business-critical devices. Replacing a stolen network router or exploded cable modem, for example, is not in itself likely to be expensive, but the downtime caused by such a situation could be costly to a business. To secure such items from theft we'd refer you to Safemark (call 01904 778899 or go to [www.safemark.co.uk](http://www.safemark.co.uk)), as the company carries a range of peripheral-protection paraphernalia. Similarly, the previously mentioned surge-diversion and uninterruptible power supply devices often feature dedicated network/modem-protection measures.



## Spiky situation

Rowlands goes on to explain that a spike entering a household's ring-main circuit has the potential to inflict fatal wounds on sensitive electrical equipment, like computers. What's more, devices damaged in this way might not be covered by household insurance and if you expect compensation to be forthcoming from your electricity supply company, think again: 'In most cases [a power spike] is just bad luck,' explains Rowlands, 'and electricity companies are only held responsible for catastrophic failures, like an occurrence on the transformer that feeds your area.'

In other words, it's up to electricity 'users' to protect themselves against fluctuations in the power supply. So, what can be done? One answer is to invest in a surge-protection device. In technical terms, a surge protector directs over-voltages in the power supply away from the mains-power socket to an alternative path of least resistance. The effect is the removal (or 'smoothing') of spikes from the supply, ensuring that the juice flowing through the power socket's pin-outs never tops the prescribed 230v.

When it comes to buying a surge protector, there are numerous makes and models from which to choose. If you're on a tight budget then Belkin's Surgecube costs a few pence over £7. This compact device protects only a single socket from spikes and surges but that's enough to keep a connected computer protected against high voltage surges.

However, if you can afford to spend a bit more then you can shield more sensitive electronic components. APC's Surge Protector P4T4-UK, for example, costs £28.20 and features a four-socket strip of surge-protected power outlets. The unit also has the ability to protect devices that connect to a telephone line, like fax machines and



**The Surgemaster Gold from Belkin features two rotating sockets**

modems. APC includes a £10,000 insurance policy that promises replacement or repair of equipment damaged by electrical surges while connected to the P4T4-UK (check the terms and conditions regarding the company's liabilities in this respect). For more information call APC on 020 8990 6400, or visit the website at [www.apc.com](http://www.apc.com).

For further surge protection, consider an offering like the Surgemaster Gold from Belkin. This £49.99 behemoth boasts seven surge-protected power sockets, along with spike-shielded telephone/modem/ADSL and digital cable/satellite set-top box sockets. What's more, two of the Surgemaster Gold's seven sockets can be rotated through 180 degrees, meaning bulky transformer plugs sit happily alongside standard three-pin mains plugs. The added bonus is Belkin's unlimited connected-equipment and data-recovery warranties (though again, be sure you understand the meanings and implications contained in the numerous clauses). For more information call 00800 2235 5460 or go to [www.belkin.co.uk](http://www.belkin.co.uk).

## Ups and downs

It's important to understand that surge protectors are not a cure-all for electricity-supply slip-ups. We mentioned earlier the potentially frustrating consequence of a reboot caused by an under-voltage, but a brownout or power cut at the wrong moment could result in serious trouble. A loss of power midway through the saving of an important document might corrupt the file, and a computer hard disk could be rendered inoperative by an electricity outage occurrence during a delicate procedure like a format.

A solution can be found in the guise of an uninterruptible power supply (UPS). A UPS is, essentially, a power socket (or sockets) that enjoys the benefit of a 230v battery backup. If the mains power dips or dies, the battery kicks in and maintains the required supply of volts. Obviously, a UPS can only provide this electrical sustenance for the life of the power cell, but the point of having such a device is to endow upon the user some time for a 'graceful' termination of operations – the alternative being a sudden and potentially disastrous absence of power.

We tested two popular uninterruptible power supply offerings, from APC and Belkin. The £103.40 Back-UPS ES 500 from APC has five standard UK three-pin mains sockets and three RJ-45 connectors (for modem/telephone/fax devices). All are surge-protected, but only three mains sockets benefit from the battery backup feature (enough to continue powering, say, a computer, monitor and cable modem). APC's quoted 'runtime' figures range from six minutes of emergency power, for someone running a tower PC connected to a 21in monitor, to 20 minutes for a desktop computer and a 15in display, which proved accurate in tests. Belkin's Regulator Pro Gold 525VA costs a bit more at £109.99, but has a total of eight three-pin IEC320-type sockets, rather than standard UK mains sockets. Again, all these sockets are surge-protected, but only four are backed up by battery – for between five and 32 minutes, depending on connected equipment.

These two devices are typical of modern uninterruptible power supplies in that they have the ability to take command of a connected computer in order to shut it down in an orderly fashion. Should a power cut occur and endure, the battery backup kicks in and the UPS sends



**Right: Belkin's Regulator Pro Gold can help protect you in a power cut, with a back-up battery supply**

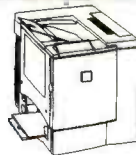


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Use your PC in a power cut with a UPS

a signal – via USB in the case of the APC Back-UPS ES 500, and serial/RS232 with the Belkin – to the PC. Assuming the user is not present, the supplied software then takes the reins and exits running applications before shutting down the computer in a controlled manner, reducing the risk of lost or damaged data files.

## Data protection acts

It's also important to consider ways of physically protecting your data. Damaged or stolen computer and office equipment can be repaired or replaced, but a failure afflicting files and folders could be fatal to future endeavours. It's not enough to simply perform regular backups of important data (though obviously, this is a must): the backup media must, itself, be secured. A sensible option is to store disk/tape data mirrors at another site so they're remote from the computer. If this is not an easy option for you, then consider investing in a good, fire-proof safe. The Consul Fire



The Sicrypt system from Fujitsu-Siemens uses smartcard or fingertip scanning to recognise a user



Data Safe, for instance, has space to store more than 100 floppy discs or CD-Rs, and is designed to keep the internal temperature below 52°C. This costs £351.33 from Safe Options – for more information call 01743 363022 or go to [www.safeoptions.co.uk](http://www.safeoptions.co.uk).

At the outset we highlighted the hazard of computers left unattended during breaks or after hours: an intruder needs only a few moments to locate private documents on a personal hard disk and view or copy them. Erecting simple security barriers, like a password-protected Windows screensaver, is a good idea, but such methods are likely to prove ineffective against the more determined data snoopers.

Specialist security software offerings, that encrypt and password-protect data, are likely to be more dependable than the freebies thrown in with Windows, but history demonstrates that few ciphers are reliably resilient. One option is to tether such protections to a physical key, as in the case of the Sicrypt system from Fujitsu-Siemens Computers. Users of this software-lock-and-hardware-key solution are required to either insert a credit card-sized smartcard or have a fingertip scanned for print recognition. The system is standard issue on various Fujitsu-Siemens desktop and notebook models, but the company sells the components necessary to convert almost any modern PC to the Sicrypt cause. The Fujitsu Siemens SCR USB Solo smartcard reader/writer, for example, costs £35.24 and plugs into the USB socket of any PC. For more information call Fujitsu Siemens on

0870 606 6677, or visit the website at [www.fujitsu-siemens.co.uk](http://www.fujitsu-siemens.co.uk).

If you can't afford to spend money on additional software or hardware, then a free alternative is to invoke your computer's Bios-level password protection feature (usually accessible by pressing the delete button as your computer goes through its boot ablutions). Bear in mind, though, that securing a computer in this way requires shutting down the machine each time you leave the desktop – if you forget the password, you're in trouble. Moreover, this method doesn't secure data: a determined digger could extract the hard disk and access the files and folders elsewhere.

We would advise against doing things on the cheap. A computer is a costly investment and the value of data is often incalculable. So be sensible, spend some money and be secure.



## I'm a computer casualty – get me out of here

Ok, so you happened upon this feature just too late for it to be of any use: disaster has already struck and you need help in a hurry. So what should you do? First, don't panic. Even if a lightning bolt from an electrical storm has zapped your computer and the only signs of activity are plumes of smoke emanating from the rear, there's still hope.

Indeed, in all but the most extreme disaster scenarios the data stored on a computer's hard disk will be recoverable – though you'll probably need some professional help. If you suspect a serious fault with your computer's drive, the advice of data-recovery experts

Data Clinic (call 0870 7424 008, or go to [www.dataclinic.co.uk](http://www.dataclinic.co.uk)) is to cut the power and not to restart the machine. Moreover, do not be tempted to install software applications that promise to automatically recover data: these can sometimes do more harm than good.

If you've been the victim of theft, we can only state the obvious – call the police. While you await their arrival, make sure the crime scene remains untouched and unpolluted: this will give investigating officers a better chance of uncovering clues that will lead to the capture of the thieves and recovery of your equipment.



Get a USB smartcard reader to link up and protect your PC



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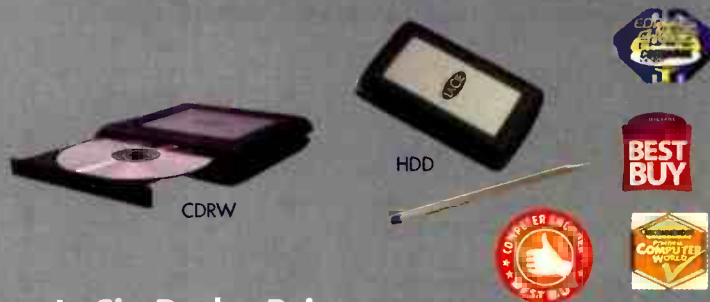
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- USB2 and Firewire (U&I) or USB2 only versions (cables included)

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# More for your money

WORDS: EMILIE MARTIN TESTING: VNU LABS PHOTOS: BRUCE MACKIE

If you are on a budget and looking for a PC, these days £700 can go a long way. We find out just what you can get for your money, with 10 of the best around

**W**ith the cost of high performance components coming down all the time, spending £700 on a PC these days does not mean you are going to end up with a second-rate system. If paying for your summer holiday has made a dent in your credit card but you fancy getting rid of your old PC, or getting a second system for the kids to use, a £700 budget should still bag you a good system.

To see exactly how much bang £700 will buy for your buck, we invited ten PC manufacturers to submit a system with a maximum price tag of £699 ex VAT. At this price point you are unlikely to see many peripherals included, but we did see an

interesting range of features in the PCs submitted, including several flat panel LCDs and a memory card reader.

Compared with the specifications of the PCs submitted to PCW's last £699 group test in December 2002, processors this time around were faster, system memory was more substantial and hard disks were beefier. This is evident in the system performance results, with every system, bar one, breaking the 200 score barrier in Sysmark. Last time around, none of the PCs achieved this.

We were looking for well-rounded machines with a good balance of quality components and features. As usual, we gave each of the systems on test individual marks for value for money, performance and features before assigning our awards.





## CCL X-Force 691

**T**he black and silver-clad X-Force 691 is a good-looking system and is one of only four PCs in this group to ship with a space-saving LCD, in this case a black 15in CTX flat panel.

CCL has done well to include an LCD at this price point but there has to be a trade-off to absorb the extra cost. This becomes apparent when you open the case to expose a rather frugal interior. For a start, the AGP slot is empty, which means you are reliant on the graphics processing power of the Nvidia Nforce2 IGP and MCP2-T chipsets featured on the MSI K7N2G motherboard. There's only an onboard sound chip, leaving four of the five PCI slots free, although only two out of five are usable – the remaining three are taken up by a Firewire bracket, an S/PDIF and a TV-out bracket. The motherboard itself, however, is one of MSI's newest Athlon-compatible boards, supporting USB2, Firewire and Serial ATA Raid, so it will be compatible with the next generation of serial hard disks. Meanwhile, the system is powered by an Athlon XP 2400+ coupled with 512MB of DDR-Ram system memory and a 80GB Maxtor hard disk.

Performance in our benchmarks was a little lacklustre, scoring 200 overall in Sysmark 2002, with individual

scores of 246 for Internet content creation and 162 for office productivity. The empty AGP slot meant that it notched up just 4,494 in 3Dmark and 33.3fps in Unreal Tournament.

At the front of the system, a Samsung combo drive offers 48x 24x 48x CD-RW functions and 16-speed DVD reading. At the rear of the tower there is a good selection of connectivity on offer, including mini and regular Firewire ports, four USB2 ports and parallel, serial and VGA sockets.

However, CCL has not spent its budget even-handedly and there are better-balanced systems in this group.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)  
**CONTACT** CCL 01274 471 266  
[www.cclcomputers.co.uk](http://www.cclcomputers.co.uk)

**PROS** Bundled LCD flat panel monitor; motherboard with serial ATA Raid forward-compatibility  
**CONS** Lacklustre system performance; onboard sound and graphics

#### VERDICT

The inclusion of an LCD display and great motherboard should make this PC more appealing, but the gaps in its specification are concerning

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## ECS Aio LCD

**E**CS stands out from the crowd this month as the only manufacturer to have submitted an all-in-one PC with a LCD screen and system built into a single unit.

The system itself is built around a 2GHz Intel Celeron processor, a 40GB IBM hard disk and two 256MB DDR-Ram sticks taking total system memory up to 512MB. These modules sit on a bespoke ECS motherboard that has been specially designed to fit inside this compact unit, and is based on a Sis560GL and Sis962 chipset. With no dedicated graphics or sound cards featured in this system, the Aio draws its sound and graphics processing power from these chips.

With these specifications, it is not surprising that the ECS trailed the rest considerably in our benchmark tests, scoring just 122 in Sysmark with individual scores of 167 and 89 in our Internet content creation and office productivity tests respectively. With onboard graphics processing it scored 830 in 3Dmark and only managed 11.6fps in Unreal Tournament, making it unsuitable for gaming.

Whether slower system performance is an acceptable trade-off for a smaller footprint will depend on how you plan to use the system. This PC would

still be more than up to the job of acting as a discreet word processing terminal.

The 15in LCD screen sits above a pair of integrated speakers, although there are enough mini jack sockets at the rear to hook up a 5.1-channel speaker set if you favour external sound. A CR-RW/DVD-Rom combo drive sits on the right-hand edge of the screen bezel offering 24x 8x 8x CD-RW functionality and eight-speed DVD reading.

There are four USB2 ports and a single Firewire port on offer, with the usual set of sockets at the rear. With no built-in floppy drive, an external USB floppy disk drive is provided.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)  
**CONTACT** Microwarehouse  
0870 555 0000

[www.microwarehouse.co.uk/ecs](http://www.microwarehouse.co.uk/ecs)

**PROS** Space-saving design; not a bad price for an all-in-one system  
**CONS** System performance; small hard disk; no viable upgrade path; external floppy drive  
**VERDICT** A good price for an all-in-one PC, but poor system performance makes it very hard to recommend the ECS

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Intellect Q24S

Intellect is the only manufacturer to build its system around a Pentium 4 processor this month. Inside the Q24S there is a 2.4GHz chip perched on the Abit SR7-8X motherboard, which houses a single 256MB module of DDR-Ram memory in one of its three Dimm slots.

A dedicated graphics card in the form of a Radeon 9000 Pro sits in the AGP slot and, with four out of five PCI slots unoccupied, there is decent upgrade potential on offer. At the front of the system there is an 80GB Seagate hard disk in one of the two occupied 3.5in drive bays – there are a further two unoccupied – and a Uranus 52x 24x 52x CD-RW drive and 16-speed Liteon DVD-Rom occupy two of the three 5.25in bays.

The Q24S put in a respectable performance in our benchmark tests, scoring 222 in Sysmark 2002, breaking down to 311 and 159 in our Internet content creation and office productivity tests respectively. Graphics processing performance was also fair with decent scores of 7,952 in 3Dmark and 50.7fps in Unreal Tournament.

The Intellect is encased in a brushed aluminum shell, which has plenty of ventilation holes to help cool down the system core. There are two USB2 ports concealed under a flap at the

foot of the front panel of the system tower, and a further four USB2 ports can be found at the rear of the system. There is both a DVI and a VGA socket for analogue and digital visual output, along with a Midi port for gamers, two serial ports and a parallel socket. In terms of communication, there is a Lan socket and two modem sockets.

Intellect has included a 15in LCD from LG with its system, but has still managed to submit a more evenly-specified system than the CCL, for example, which becomes evident when you compare the system performance of these two machines.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Intellect

0870 122 5590

[www.intellect.uk.com](http://www.intellect.uk.com)

**PROS** Good system performance; the LCD monitor will conserve desktop space; good connectivity

**CONS** Only 256MB of system memory

### VERDICT

The Intellect is a well-balanced system, but there are more compelling buys to be had in this group

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



## Jal Virgo 750SB

In common with the vast majority of PC manufacturers which have submitted to this group, Jal has chosen an Athlon processor to power its system, in this case the XP 2600+. There is a single 256MB module of DDR-Ram system memory sitting in one of the three Dimm slots on the Gigabyte GA-7VAX motherboard, and an 80GB Maxtor hard disk.

With a Radeon 9500 Pro graphics card in the AGP slot we were expecting the Jal to score well in our graphics processing tests, and the Virgo 750SB didn't disappoint, notching up 11,636 in 3Dmark and 56.8fps in Unreal Tournament. It didn't do as well as the rest of the competition in Sysmark, however. Its overall score of 204, with 251 for Internet content creation and 166 for office productivity, was decent enough, but still places the Jal towards the bottom of the pack.

With three out of five PCI slots unoccupied, in addition to those two free Dimm slots, there is respectable upgrade potential. Admittedly, one further PCI slot is blocked by a USB bracket, but as the Jal is the only machine in this group to include a dedicated sound card in the form of the Creative Sound Blaster Audigy. A Firewire and four USB2 ports come off the back of this PCI card, offering

good connectivity for peripherals. There are another two USB2 ports concealed under a flap at the foot of the front panel of the system tower.

The main optical storage device is a 52x 24x 52x Aopen CD-RW drive and there is also a 16-speed DVD-Rom sitting in another of the optical drive bays, leaving two further bays unoccupied. At the back of the tower are two Midi ports, two modem ports, two Midi sockets a serial and a parallel port, along with the selection of 5.1-channel mini jack sockets.

A 17in Mitsubishi Diamond Pro 750SB CRT monitor is also included.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Jal 01782 848 100

[www.jal.co.uk](http://www.jal.co.uk)

**PROS** The only PC in this group to include a dedicated sound card as well as a graphics card; great graphics processing performance

**CONS** Only 256MB of system memory; failed to shine in Sysmark

### VERDICT

A very well-specified PC that sadly lagged the rest of the pack in Sysmark

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





## Mesh Matrix 2500+ FWD

**T**he Mesh Matrix 2500+ FWD is a smart looking system housed in a lockable black and cream case, with a matching cream 16in flat screen Mitsubishi Diamond Pro 750SB CRT monitor offering 1,600 × 1,200 pixel resolution.

Remove the case and you will find a well-specified system built around an Athlon XP 2500+ processor, which sits on an Asus A7N8X motherboard with five PCI slots. Four of these are unoccupied, providing good upgrade potential, although one of these free slots is effectively out of action, as a Midi joystick port bracket is attached to the backplate. Meanwhile, there is a Radeon 9500 graphics card sitting in the AGP slot.

A pair of 256MB modules of PC2700 DDR-Ram system memory take up two of the three Dimm slots on this board, which supports a maximum of 3GB of memory. At the front of the case, a 120GB Maxtor hard disk occupies one of the three 3.5in drive bays, which have been mounted with the openings at 90degrees to the case cover, which makes it easier to install or remove drives. Up above, a 16-speed Pioneer DVD-Rom and 48x 16x 48x Teac CD-RW are mounted in two of the three 5.25in optical drive bays.

The Mesh put in a good performance across the board

in our benchmark tests, with an overall score of 239 in Sysmark 2002, which breaks down into individual scores of 291 for Internet content creation and 196 for office productivity. In 3Dmark, it clocked up a score of 11,341 and managed 64.8fps in Unreal Tournament.

There are six USB2 ports; four at the rear of the case and two at the front. At the rear of the system you will also find VGA and DVI ports along with serial, parallel and Midi ports, a Lan port and two modem sockets. A wired Logitech mouse and keyboard are also included, along with a set of 4.1-channel Creative Inspire 4400 speakers.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Mesh  
0870 046 4747

[www.meshcomputers.com](http://www.meshcomputers.com)

**PROS** Excellent performance and specifications; speakers are bundled, along with a game pad and joystick; good connectivity

**CONS** Onboard sound

### VERDICT

**A great system all-round, which is well worth consideration if an LCD monitor isn't a top priority**

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Multivision Ionix SP-2500NF

**T**he Multivision's black system case is a screw-free affair, with a blue LED strip mounted on the front panel, which lights up when you turn it on. On each side of the tower a case clip gives hassle-free access to the system interior, which reveals a well-specified PC.

Multivision has taken an Athlon XP 2500+ processor as its starting point and added the same motherboard as that found in the Systemax, based on Nvidia's Nforce2 chipset. Two of the three Dimm slots are occupied, each with a 256MB module of DDR-Ram memory, taking total system memory up to 512MB. At the front of the system a 120GB Hitachi hard disk sits in one of the three 3.5in drive bays and adds some muscle to the system.

A modem card and Firewire card with three ports on the back plate occupy two of the PCI slots, leaving a further three slots unoccupied. Just above, a Radeon 9500 graphics card sits in the AGP slot, which must have contributed to the Multivision's high scores of 11,256 in 3Dmark and 63.2fps in Unreal Tournament. System performance was also good in Sysmark 2002, with an overall score of 232, 288 for Internet content creation and 187 for office productivity.

At the front of the system tower you will find a floppy drive, a 52x 24x 52x CD-RW drive and 16-speed Atapi DVD-Rom drive, while tucked away on the right is a small flap that conceals a Firewire port and two USB2 ports. There are another four USB2 ports at the rear of the tower, along with the Firewire ports already mentioned, a DVI and a VGA socket, Lan, parallel and serial ports.

The Multivision ships with a LG Flatron F700P CRT monitor with maximum resolution of 1,600 × 1,200, while a black Logitech optical mouse with scroll wheel and Internet keyboard are also bundled.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Multivision  
0870 066 0885

[www.multivision.co.uk](http://www.multivision.co.uk)

**PROS** Good system performance; plenty of Firewire connectivity; large hard drive; optical mouse; respectable warranty

**CONS** That CRT monitor will take up more desk space than an LCD

### VERDICT

**A good system that is simply outshone by other PCs on test here**

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



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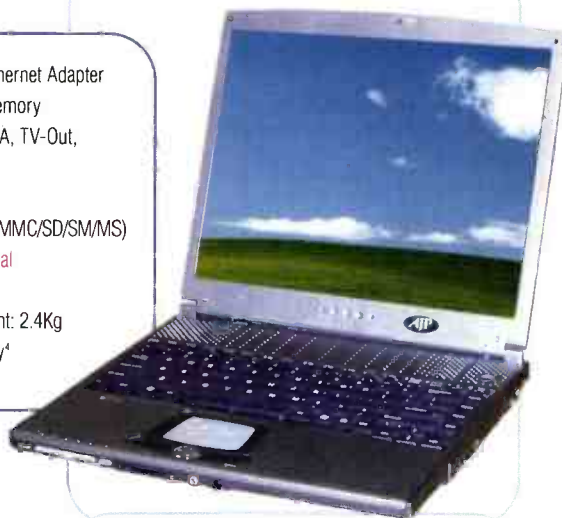
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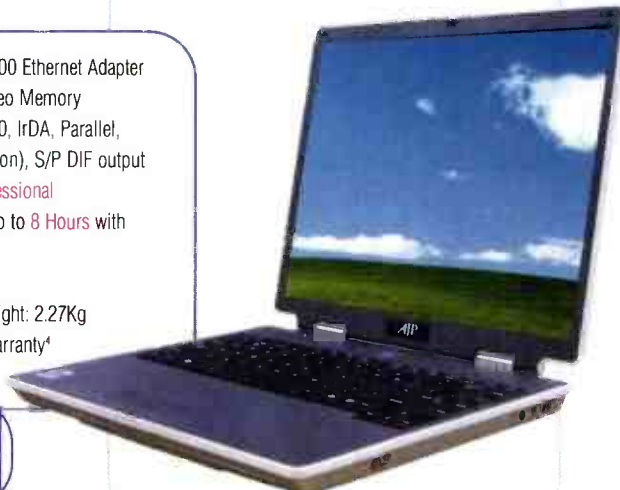
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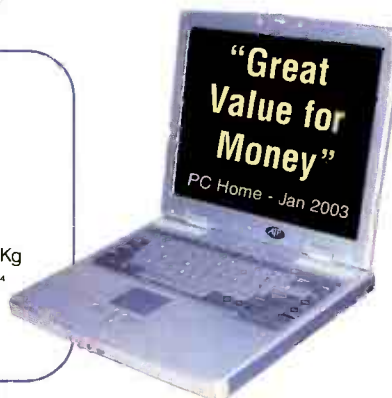
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- 32MB DDR Shared Video Memory
- IEEE 1394 Firewire 400Mbps port
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- Built in Wireless Antenna
- 328(W)x274(D)x37mm(H) / Weight: 3.4Kg
- Carry Case, 36 months RTB Warranty<sup>4</sup>

Standard Features: Built in 3D Sound & Speakers, (Optional) Wireless LAN module, 1x PC Card Slot, Smart Li-Ion Battery<sup>2</sup>, (Optional) External USB 3.5" FDD, Windows XP Home with CD & Manual

15.1" TFT | AMD Athlon XP 2400+ | 512MB RAM | Silent 40GB HDD | Combo Drive

15.1"  
**£849**  
ex. VAT  
£997.58  
inc. VAT



Gold Award  
Jan 2003



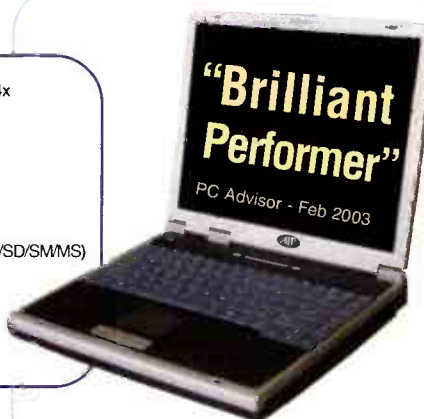
## AJP 8640 - High End Notebook

- 15.1" TFT SXGA+ (1400x1050)
- 2.4GHz Intel® Pentium 4 with 512K Cache (Optional 2.66GHz, 2.8GHz, 3.06GHz)
- 512MB DDR RAM (upgradeable to 1GB)
- 40GB HDD (upgradeable to 80GB)
- Combo DVD/CD-RW Drive
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- nVidia GeForce4 420 Go with Integrated AGP 4x
- 64MB DDR Video RAM
- IEEE 1394 Firewire 400Mbps port
- Ports: 4xUSB 2.0, IrDA, TV-Out, Parallel, Monitor, PS/2, S/P DIF output
- Built in Wireless Antenna
- Built in Smart Card Reader<sup>3</sup> (Supports MMC/SD/SMMS)
- 332(W)x285(D)x39mm(H) / Weight: 3.4Kg
- Carry Case, 36 months RTB Warranty<sup>4</sup>

Standard Features: Built in 3D Sound & Speakers, (Optional) Wireless LAN module, 1x PC Card Slot, Smart Li-Ion Battery<sup>2</sup>, 4 Hot Keys (one button access to any application), (Optional) External USB 3.5" FDD, Windows XP Home with CD & Manual

15.1" TFT | P4 2.4GHz | 512MB RAM | Silent 40GB HDD | Combo Drive

15.1"  
**£925**  
ex. VAT  
£1086.88  
inc. VAT



Gold Award  
Feb 2003



## AJP NeoPC 4 - Desktop with a Difference

- 15.1" TFT XGA (1024x768) or
- 17.1" TFT SXGA (1280x1024)
- 2.66GHz Intel Pentium 4 with 512K Cache (Optional 2.8GHz)
- 512MB DDR RAM (upgradeable to 1GB)
- 80GB HDD (7200 RPM, upgradeable to 120GB)
- Combo DVD/CD-RW Drive
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- 64MB DDR Shared Video Memory
- IEEE 1394 Firewire 400Mbps port
- Ports: 4xUSB 2.0, Parallel, Monitor, 2x PS/2
- Built in Wireless Antenna
- Cordless Keyboard & Mouse
- 369(W)x188(D)x384mm(H) / Weight: 8.8Kg
- 0-15° Screen Tilt, 270° Swivel Base
- 36 months RTB Warranty<sup>4</sup>

Standard Features: Built in 3.5" FDD, Built in 3D Sound & Speakers, (Optional) Wireless LAN module, 2x PC Card Slot, Windows XP Home with CD & Manual

15.1/17.1" TFT | P4 2.66GHz | 512MB RAM | 80GB HDD | Combo Drive

15.1"  
**£949**  
ex. VAT  
£1110.08  
inc. VAT

17.1"  
**£1049**  
ex. VAT  
£1232.50  
inc. VAT



What PC?  
Recommended  
2002



PC Home  
Silver Award  
2002

<sup>1</sup>Upgrade 80GB to 120GB HDD Add £49+VAT

## Mio 338 - PDA

- Slim & Light Colour PDA
- Intel PXA250 200MHz CPU
- Microsoft Pocket PC 2002
- 32MB Flash
- 64MB SDRAM
- 3.5" Colour TFT LCD
- MP3 Playback
- On-Screen Keyboard, Stylus Pen & Handwriting Recognition
- Weight: 116g
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What Laptop Silver Award (8880E) - May 2003



## 8880E - More Features than Ever, MP3, TV Tuner, Full Size Keyboard...

### AJP 8880E - Ultimate Desktop Replacement

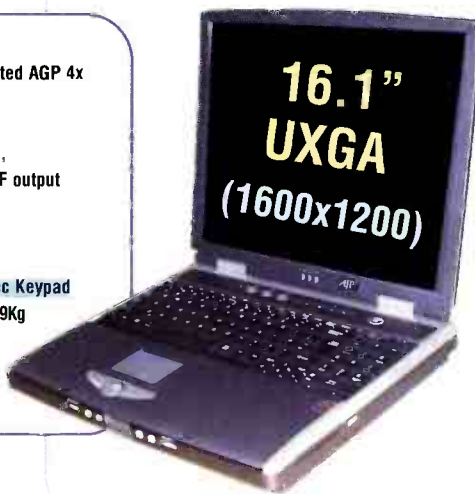
- 16.1" TFT UXGA (1600x1200)
- 2.66GHz Intel® Pentium 4 with 512K Cache (Optional 2.8GHz, 3.06GHz)
- 512MB DDR RAM (upgradeable to 1GB)
- 40GB HDD (upgradeable to 80GB)
- Built in 3.5" FDD
- Bay 1 Combo DVD/CD-RW Drive
- Bay 2 Optional 2nd HDD, \*DVD or IP Sharing
- Bay 3 Optional 3rd HDD or TV Tuner
- Bay 4 Optional MP3 Player / Storage Disk
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI Mobility Radeon 9000 with Integrated AGP 4x
- 128MB DDR Video RAM
- IEEE 1394 Firewire 400Mbps port
- Ports: 4xUSB 2.0, IrDA, TV-Out, Video In, Parallel, Serial, Monitor, PS/2, S/P DIF output
- Built in Wireless Antenna
- Sony Memory Card Slot
- Audio DJ onboard
- Full Size Keyboard & Separate Numeric Keypad
- 360(W)x299(D)x54.5mm(H) / Weight: 4.9Kg
- Carry Case, 24 months RTB Warranty\*

Standard Features: (Optional) 4x IP Sharing Module for Networking/ADSL, (Optional) Wireless LAN module, Built in 3.5" FDD, Built in 3D Sound & Speakers, 2x PC Card Slot, Smart Li-Ion Battery\*\*, 3 Hot Keys (Email, Web Browser, Application), Windows XP Home with CD & Manual

16.1" TFT | P4 2.66GHz | 512MB RAM | Silent 40GB HDD | Combo Drive

16.1" **£1249** ex. VAT  
**£1467.58** inc. VAT

\*An additional DVD will offer you a fast copy facility  
For all other add ons, see 'Options & Upgrades'



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What Laptop

Silver Award  
May 2003

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April 2003

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PC ADVISOR

Recommended  
Dec 2002

HIT!

Computer Shopper  
Hit Award Nov 2002

### AJP 5600D - Ultra High End Notebook

- 15.1" TFT UXGA (1600x1200)
- 2.66GHz Intel Pentium 4 with 512K Cache (Optional 2.8GHz, 3.06GHz)
- 512MB DDR RAM (upgradeable to 1GB)
- 40GB HDD (Removable, upgradeable to 80GB)
- Combo DVD/CD-RW Drive
- Built in 3.5" FDD (HotSwappable with 2nd Battery, \*DVD or removable 2nd HDD)
- Built in 56K fax/modem
- Built in 10/100 Ethernet Adapter
- ATI Mobility Radeon 9000 with Integrated AGP 4x
- 64MB QDR Dedicated Video Memory
- IEEE 1394 Firewire 400Mbps port
- Ports: 4xUSB 2.0, IrDA, TV-Out, Parallel, Monitor, PS/2, S/P DIF output
- Built in Wireless Antenna
- Audio DJ onboard
- 329(W)x290(D)x44mm(H) / Weight: 3.7Kg
- Carry Case, 36 months RTB Warranty\*

Standard Features: Built in 3.5" FDD, (Optional) Wireless LAN module, Built in 3D Sound & Speakers, 1x PC Card Slot, Smart Li-Ion Battery\*\*, 3 Hot Keys (Email, Web Browser, Media Player), Windows XP Home with CD & Manual

\*An additional DVD will offer you a fast copy facility  
For all other add ons, see 'Options & Upgrades'

15.1" TFT | P4 2.66GHz | 512MB RAM | Silent 40GB HDD | Combo Drive

15.1" **£1075** ex. VAT  
**£1263.13** inc. VAT

Options & Upgrades

For all CPU upgrades Please Call.....	EPOA
Upgrade Combo Drive to DVD-RW/CD-RW.....	£135 (£158.63)
Upgrade 40GB to 60GB.....	£49 (£57.58)
Wireless LAN PCI Module.....	£69 (£81.08)
Upgrade to Windows XP Pro.....	£39 (£45.83)
External USB Pen Drive (64MB).....	£33 (£38.78)
Additional Options for the 8880E/5600D	
Additional DVD Drive.....	£79 (£92.83)
Additional 40GB HDD & Kit.....	£149 (£175.08)
Additional 60GB HDD & Kit.....	£199 (£233.83)
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TV Tuner & Remote Control.....	£89 (£104.58)
IP Sharing Module.....	£99 (£116.33)



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\*Account is interest free if repaid in full with the 6th monthly payment. A 5% deposit is required. At the offset a 48 month finance agreement is issued at 29.8% APR. Typical example: £1,000.00 less 5% deposit, financed sum £950.00. A) For a 48 month finance agreement monthly payments of £32.25, (total payable £1,586.00 APR 29.8% Variable) or B) For a 6 month INTEREST FREE finance agreement 5 monthly payments of £32.25 and the balance of £768.75 on the 6th month (total payable £950.00 APR 0%). All loans are subject to status. Written quotations available on request. AJP is a Licensed Credit Broker.





## Poweroid 3021

**T**his month, Poweroid has coupled an Athlon XP 2600+ processor with a Gigabyte motherboard that is built around a Via KT400 chipset. The board supports up to 3GB of system memory in three slots and, as Poweroid has included a single 512MB stick of memory, you could boost this to 2.5GB in this configuration. An 80GB Western Digital Caviar hard disk completes the system core.

This PC offers good upgrade potential, which may suit those looking to make a small initial financial outlay on a basic but well-specified system and then add components. A modem card occupies one of the five PCI slots, leaving four slots free to house features such as a sound card, which is not included, although you do get a set of Creative Inspire 4.1-channel 4400 speakers. Just above the PCI slots, a Geforce4 Ti4600 graphics card sits in the AGP slot and helped place this PC at the top of the pile in 3Dmark, with a massive score of 13,168. In Unreal Tournament it came second only to the SNS, with an equally impressive score of 65.1fps. System performance was also good in Sysmark, with a score of 275 for Internet content creation and 186 for office productivity, giving an overall score of 226.

A 48x 12x 48x Sony CD-RW drive and DVD-Rom with

16-speed DVD read sit in two of the four optical drive bays, while four of the six 3.5in bays are also unoccupied. There are two front-mounted USB2 ports on the system tower with another two at the rear along with three Firewire ports. At the back of the system you will also find two serial ports, a parallel port, VGA and DVI ports and a Midi port along with the usual selection of mini jack sockets.

The 15in Iiyama LCD flat panel monitor that ships with this PC has a maximum resolution of 1,024 x 768 pixels, and a Mitsumi wired keyboard and mouse with a scroll touchpoint complete the line-up.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Poweroid  
0870 220 0444

[www.poweroid.com](http://www.poweroid.com)

**PROS** Good graphics card and excellent graphics performance in our tests; good upgrade path; LCD monitor; good connectivity

**CONS** Onboard sound; fairly average hard drive

### VERDICT

**A well-rounded system capable of great performance and that LCD monitor clinches it an award**

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## SNS Platinum 2700W

**A** newcomer to PCW group tests, SNS has submitted a system with an Athlon XP 2700+ processor and Asus A7N8X motherboard at its core, to which 512MB of DDR-Ram memory and an 80GB Seagate hard disk have been added.

SNS has included a Geforce4 Ti4800 graphics card in the AGP slot of this machine, which helped the 2700W achieve some impressive scores in our graphics processing tests, with a result of 12,531 in 3Dmark and 66.9fps in Unreal Tournament. System performance in Sysmark 2002 was also good, with an overall score of 228, and individual scores of 279 for Internet content creation and 186 for office productivity.

The PCI slots and brackets are screw-free, with hinged plastic clips used to secure the PCI cards. Only one of the five PCI slots in this system is occupied – there is a modem card in there – but of the remaining four, only one is actually usable as a Midi bracket, serial bracket and Firewire bracket put three of the back plates out of action. Of the four 5.25in drive bays, two house optical drives: an LG CD-RW with read, rewrite and write speeds of 52x 24x 52x respectively and a 16-speed LG DVD-Rom drive. Just below, five of the seven 3.5in bays are unoccupied.

On the exterior of the system case, a fold-down flap at the foot of the front panel conceals two USB2 ports along with microphone and headphone mini jack sockets. Turn the tower around and you will discover a further four USB2 ports, along with DVI and VGA ports, a serial and a parallel port and the dual Lan sockets that are an optional feature on this motherboard.

The LG Flatron F700P that also partners the Multivision gives good picture quality, but the inclusion of a budget mouse and keyboard is disappointing. This is, however, a minor criticism of what is otherwise a well-specified machine.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** SNS  
0870 748 4111

[www.sns-ltd.co.uk](http://www.sns-ltd.co.uk)

**PROS** System performance; good graphics card; Firewire and USB2; screw-free PCI slots; analogue and digital visual output

**CONS** Budget keyboard and mouse; most of the PCI slots are blocked

### VERDICT

**A great system that just misses out on an award**

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Systemax Inspire 3127

**S**ystemax has built the Inspire 3127 system around an Athlon XP 2500+ processor and MSI MS-6570 motherboard with an Nvidia Nforce2 chipset. This board is actually a variant of the model used in the CCL system and features a Bluetooth pin header. If you have a Bluetooth-enabled PDA, you might want to get a Bluetooth module so you can transfer data between your handheld device and PC.

The Systemax's 256MB of DDR system memory is not the most generous on offer here, and the 60GB IBM hard disk is a little on the puny side. Nevertheless, the Inspire 3127 performed well in our tests, clocking up an overall score of 228 in Sysmark 2002. The MSI Geforce4 FX 5600 Ultra graphics card sitting in the AGP slot helped it notch up 11,103 in 3Dmark and 61.52fps in Unreal Tournament.

There is decent upgrade potential here, with four of the five PCI slots on the motherboard unoccupied, although an S/PDIF bracket does render a further PCI slot unusable.

At the front of the system, meanwhile, a 16-speed DVD-Rom drive and a CD-RW drive boasting speeds of 52x 24x 52x occupy both 5.25in bays, while three of the four 3.5in bays are occupied. A six-in-one

media card reader, with slots for Smart Media, Compact Flash, Secure Digital, Multimedia and Memory Sticks, sits in one of these 3.5in bays. While it is unlikely you will require compatibility with all of these cards, if you have a digital camera and a notebook or printer with integrated card readers, this selection of slots may come in useful. There is also a USB2 port mounted on the front of this drive.

The usual array of ports and sockets is included at the rear of the system and a 19in flat screen CTX monitor and a set of 4.1-channel Creative Inspire 4400 speakers is also included.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Systemax  
0870 729 7366

[www.systemaxpc.co.uk](http://www.systemaxpc.co.uk)

**PROS** 19in monitor; 6-in-1 card reader; dedicated graphics card; speakers; Bluetooth-compatible motherboard

**CONS** System performance; small hard disk and memory provision

### VERDICT

An impressive, feature-rich PC but not the best-balanced or best-specified system in the group

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Watford Aries Performa Pro NF2

**A**ries enters our group test this month with a PC built around an Athlon XP 2600+ processor, sitting on an MSI motherboard based on Nvidia's Nforce2 chipset. This board features three Dimm slots, two of which are occupied with twin 256MB modules of DDR-Ram memory, while an 80GB Samsung hard disk completes the system core.

System performance was good, with an overall score of 224 in Sysmark. This breaks down to give individual scores of 272 in our Internet content creation tests and 185 for office productivity. The Geforce4 Ti4200 graphics card helped it to achieve a very respectable score of 11,642 in 3Dmark and 62.2fps in Unreal Tournament.

The PCI and AGP slots, along with the drive bays at the front of the system, are screw-free, which makes component installation or removal less fiddly for those who are upgrade-inclined. Of the five PCI slots on this motherboard, only one is occupied by a modem card, although another two backplates are taken up with S/PDIF and Firewire brackets.

At the front of the case, there are two free 5.25in optical drive bays and three of the five 3.5in bays wait to house additional drives. The primary optical drive has speeds of 52x 24x 52x and

accompanies a 16-speed Atapi DVD-Rom. Both optical drives are concealed behind flaps on the front panel of the system tower, which mechanically fold down when you press the open button, and there is another flap at the foot of the case housing a Firewire port and two USB2 sockets.

At the back of the system four further USB2 ports, a mini Firewire and full-size Firewire port accompany the usual range of mini jack sockets and ports, which includes a DVI socket and two VGA ports. The bundled 15in Aries flat panel monitor has a maximum resolution of 1,024 × 768 pixels.

### DETAILS

**PRICE** £821.33 (£699 ex VAT)

**CONTACT** Watford Aries  
0870 220 0707

[www.watford.co.uk](http://www.watford.co.uk)

**PROS** Consistently good system performance; dedicated graphics card; screw-free interior; LCD monitor

**CONS** The flaps that conceal the optical drives also conceal the open/close buttons when open

### VERDICT

Good system performance is balanced with desirable features to make this an appealing buy

<b>FEATURES</b>	★★★★★
<b>PERFORMANCE</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★





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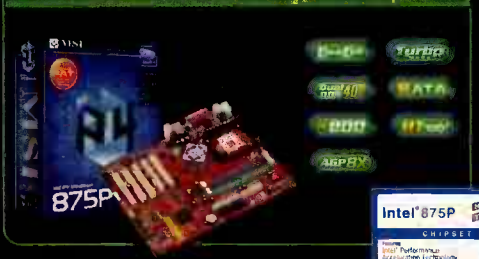


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### 875P Neo Intel® 875P Chipset



### 865PE Neo2 Intel® 865PE Chipset



### K7N2 Delta NVIDIA nForce2 Chipset



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[www.powerc.com](http://www.powerc.com)  
Refresh  
[www.refreshcomputers.com](http://www.refreshcomputers.com)  
RL Supplies  
01923 896 996

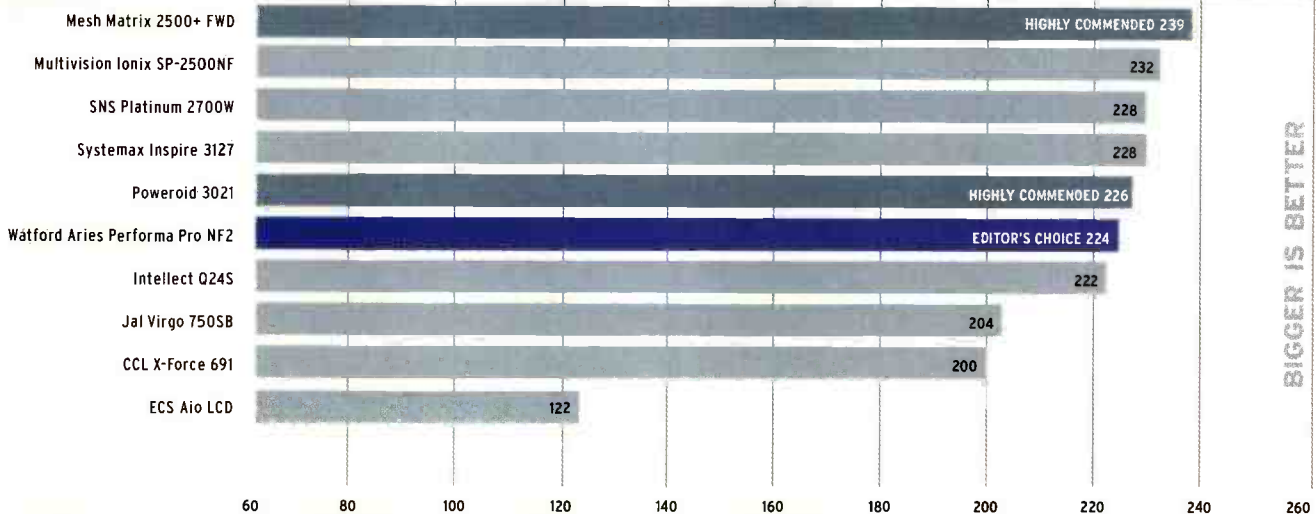
Scan  
[www.scan.co.uk](http://www.scan.co.uk)  
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Stak Trading  
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Watford  
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# Lab results

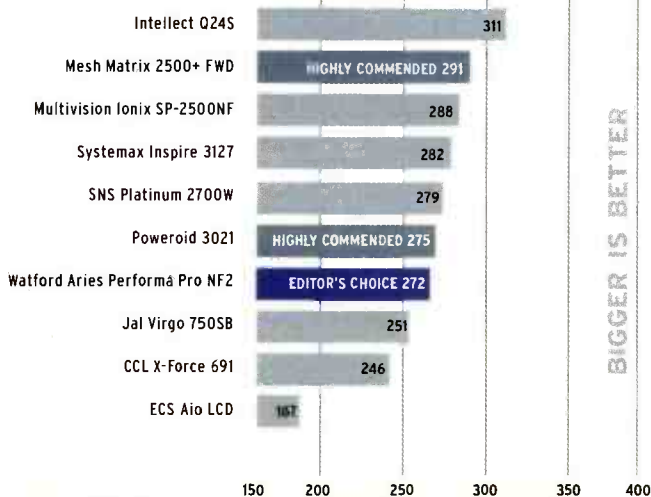


## Sysmark 2002 overall



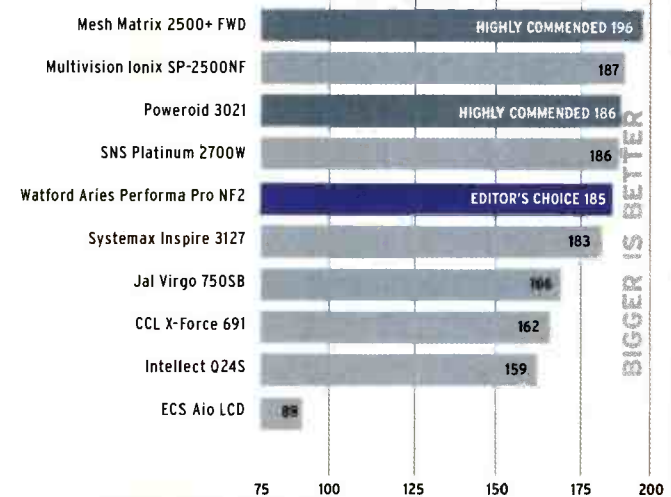
BIGGER IS BETTER

## Sysmark 2002 Internet content creation



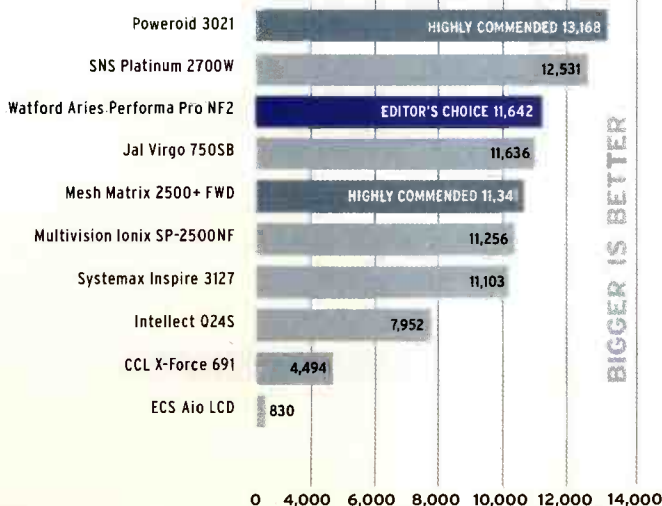
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## Sysmark 2002 office productivity



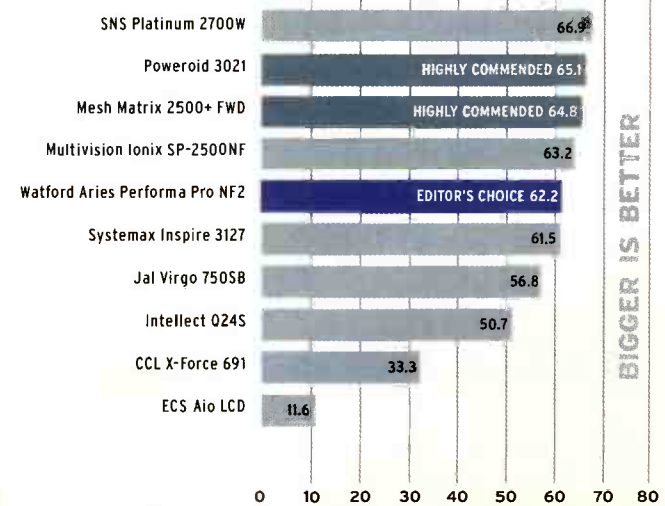
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## 3Dmark 2001 (1,024 x 768 at 32bit)



BIGGER IS BETTER

## Unreal Tournament (fps) (1,024 x 768 at 32bit)







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Please see page 12 for an explanation of how we tested the PCs



# Group test >> £699 PCs

## Table of features

				
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MODEL	X-FORCE 691	AIO LCD	Q24S	VIRGO 750SB
Price inc VAT (ex VAT)	£821.33 (£699)	£821.33 (£699)	£821.33 (£699)	£821.33 (£699)
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URL	<a href="http://www.cclcomputers.co.uk">www.cclcomputers.co.uk</a>	<a href="http://www.microwarehouse.co.uk/ecs">www.microwarehouse.co.uk/ecs</a>	<a href="http://www.intellect.uk.com">www.intellect.uk.com</a>	<a href="http://www.jal.co.uk">www.jal.co.uk</a>
HARDWARE SPECS				
Processor	AMD Athlon XP 2400+ 2.0GHz	Intel Celeron 2GHz	Intel Pentium 4 2.4GHz	AMD Athlon XP 2600+ 2.13GHz
Memory quantity and type	512MB DDR SD-Ram PC2700	512MB DDR SD-Ram PC2100	256MB DDR SD-Ram PC2700	256MB DDR SD-Ram PC2700
Occupied/spare memory (Ram) slots	2/1	2/0	1/2	1/2
Max memory in this configuration	1.5GB	512MB	1.75GB	2.25GB
Maximum memory supported by motherboard	3GB	2GB	2GB (DDR333)/3GB (DDR2,100, 1,600)	3GB
Hard disk manufacturer, model and spin speed	Maxtor 6Y080L0 7,200rpm	IBM120GXP 7,200rpm	Seagate ST380021A 7,200rpm	Maxtor 6Y080L0 7,200rpm
Hard disk size	80GB UltraDMA133	40GB UltraDMA100	80GB UltraDMA100	80GB UltraDMA133
Storage drive manufacturer	Samsung SM-348B CD-RW/DVD-Rom	QSI SBW-081 CD-RW/DVD-Rom	Uranus CDR-6552 CD-RW	Aopen CRW5224
Drive speed	48x 24x 48x, 16x DVD-Rom	8x 8x 24x, 8x DVD-Rom	52x 24x 52x	52x 24x 52x
MOTHERBOARD COMPONENTS				
Motherboard manufacturer/model	MSI K7N2	ECS MB-A950	Abit SR7-BX	Gigabyte GA-7VAX
Chipset manufacturer/model	Nvidia Nforce2	Sis 650GL	Sis 648	VIA/KT400
EXPANSION AND I/O				
No of 3.5/5.25in bays	4/6	1/1	4/3	4/4
No of free 3.5/5.25in bays	3/4	0/0	2/1	2/2
No of PCI/shared/AMR slots	5/1/1	0/0/0	5/0/0	5/0/0
No of free PCI/shared/AMR slots	4/1/1	0/0/0	4/0/0	3/0/0
No of USB 1.1/USB2/Firewire	0/4/2	0/4/1	0/6/0	2/4/1
No of serial/parallel/PS/2	2/1/2	1/1/2	2/1/2	2/1/2
MULTIMEDIA				
DVD manufacturer	Combo drive	Combo drive	Liteon LTD-16X5H DVD-Rom	Artec DHMG48 DVD-Rom
DVD speed	See above	See above	16x	16x
Sound card manufacturer and model	Onboard Realtek ALC650	Onboard C-Media	Onboard Avance ALC201A	Creative Soundblaster Audigy Live
Speakers manufacturer and model	Videologic ZXR-550	Integrated	Labtec LCS-2414	Nicole 5.1 SD2500
Graphics card manufacturer and model	Onboard Nvidia Geforce4 MX Integrated GPU	Onboard Sis 560GL	ATI Powercolour Radeon 9000 Pro	Connect 3D Radeon 9500 Pro
Chipset	Nvidia Nforce2	Sis 560GL	ATI Radeon 9000 Pro	ATI Radeon 9500 Pro
Memory and type	128MB DDR SD-Ram (shared system memory)	32MB DDR SD-Ram (shared system memory)	128MB DDR SD-Ram	128MB DDR SD-Ram
Monitor manufacturer and model	CTX S500B	Integrated ECS LCD monitor	LG Flatron L1510S	Mitsubishi Diamond Pro 750
Monitor size/max viewable diagonal	15in/15in	15in/15in	15in/15in	17in/16in
Maximum resolution at Vesa refresh	1,024 × 768	1,280 × 1,024	1,024 × 768	1,600 × 1,200 at 75Hz
OTHER INFORMATION				
Misc hardware/modem	Best Data K56 Flex Fax modem	HSP56 modem, USB external floppy disk	Intel V92 modem	Intel V92 modem
Bundled software	Ability Office 2002, Panda Antivirus Titanium, Cyberlink PowerDVD XP, EasyCD Creator Standard	PC Cillin, Intervideo, WinDVD	Openoffice.org 1.02, Norton Internet Securities 2003, Ahead Nero 5	Microsoft Works Suite 7, Ahead Nero 5, Norton Internet Security, Cyberlink PowerDVD
Standard warranty (RTB = return to base, C&R = collect and return)	3yrs RTB	1yr RTB	1yr on site, 1yr RTB	2yrs on site parts and labour, lifetime RTB labour only
SCORES				
Features	★★★★★	★★★★★	★★★★★	★★★★★
Performance	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall score	★★★★★	★★★★★	★★★★★	★★★★★

     					
MESH	MULTIVISION	POWEROID	SNS	SYSTEMAX	WATFORD ARIES
MATRIX 2500+ FWD	IONIX SP-2500NF	3021	PLATINUM 2700W	INSPIRE 3127	PERFORMA PRO NF2
£821.33 (£699)	£821.33 (£699)	£821.33 (£699)	£821.33 (£699)	£821.33 (£699)	£821.33 (£699)
0870 046 4747	0870 066 0885	0870 220 0444	0870 748 4111	0870 729 7366	0870 220 0707
<a href="http://www.meshcomputers.com">www.meshcomputers.com</a>	<a href="http://www.multivision.co.uk">www.multivision.co.uk</a>	<a href="http://www.poweroid.com">www.poweroid.com</a>	<a href="http://www.sns-ltd.co.uk">www.sns-ltd.co.uk</a>	<a href="http://www.systemaxpc.co.uk">www.systemaxpc.co.uk</a>	<a href="http://www.watford.co.uk">www.watford.co.uk</a>
AMD Athlon XP 2500+ 1.85GHz	AMD Athlon XP 2500+ 1.83GHz	AMD Athlon XP 2600+ 2.13GHz	AMD Athlon XP 2700+ 2.17GHz	AMD Athlon XP 2500+ 1.83GHz	AMD Athlon XP 2600+ 2.08GHz
512MB DDR SD-Ram PC2700	512MB DDR SD-Ram PC2700	512MB DDR SD-Ram PC2700	512MB SD-Ram DDR 400	256MB DDR SD-Ram PC2700	512MB DDR SD-Ram PC2700
2/1	2/1	1/2	2/1	1/2	2/1
1.5GB	1.5GB	2.5GB	1.5GB	2.25GB	1.5GB
3GB	3GB	3GB	3GB	3GB	3GB
Maxtor 6Y120P0 7,200rpm	Hitachi Deskstar 1800XP 7,200rpm	Western Digital Caviar 7,200rpm	Seagate ST380021A 7,200rpm	IBM 180CXP 7,200rpm	Samsung SP0802N 7,200rpm
120GB UltraDMA133	120GB UltraDMA100	80GB UltraDMA100	80GB UltraDMA	60GB UltraDMA100	80GB UltraDMA100
Teac CD-W548E CD-RW	MSI 522452 Plus CD-RW	Sony CRX210E1 CD-RW	LG GCE-852 CD-RW	MSI CD-RW	MSI MS-8352A CD-RW
48x16x48x	52x24x52x	48x12x48x	52x24x52x	52x24x52x	52x24x52x
Asus A7N8X	MSI K7N2	Gigabyte FSB333	Asus A7N8X	MSI K7N2	MSI K7N2G
Nvidia Nforce2	Nvidia Nforce2	VIA KT400	Nvidia Nforce2	Nvidia Nforce 2	Nvidia Nforce 2
4/3	4/4	6/4	7/4	4/3	5/4
2/1	2/2	4/2	4/2	1/1	2/2
5/0/0	5/0/1	5/0/0	5/0/0	5/0/0	5/1/0
4/0/0	3/0/1	4/0/0	4/0/1	4/0/0	4/1/0
0/6/0	0/6/4	0/4/3	0/6/2	0/5/0	0/6/3
1/1/2	1/1/2	2/1/2	2/1/2	1/1/2	1/1/2
Pioneer DVD-116 DVD-Rom	Atapi DM1680 DVD-Rom	Sony DDUI621 DVD-Rom	LG 8161B DVD-Rom	Samsung SD616	MSI MS-8216 DVD-Rom
16x	16x	16x	16x	16x	16x
Onboard Nvidia Nforce2	Onboard Nvidia Nforce2	Onboard Realtek ALC650	Onboard Realtek ALC650	Onboard Realtek ALC650	Onboard Nvidia Nforce2
Creative Inspire 414400	Creative Inspire 515300	Creative Inspire 4400	Videologic ZXR-550	Creative Inspire 4400	Videologic ZXR-500
ATI Radeon 9500	ATI Radeon 9500	Gainward Geforce4 Powerpack Ultra/750Tv/DVI	Gainward Geforce4 Powerpack Ultra/750'8X XP Golden Sample	MSI Geforce 4 FX 5600 Ultra	MS Starforce Geforce4 Ti 4200
ATI Radeon 9500	ATI Radeon 9500	Nvidia T14600	Nvidia T14800SE	Geforce FX5600 Ultra	Geforce Ti 4200-8X
128MB DDR SD-Ram	128MB DDR SD-Ram	128MB DDR SD-Ram	128MB DDR SD-Ram	128MB SD-Ram	128MB DDR SD-Ram
Mitsubishi Diamond Pro 750	LG Flatron F700P	Iiyama BX3814UT	LG Flatron F700P	CTX EX950F	Aries A150X1
17in/16in	17in/16in	15in/15in	17in/16in	19in/18in	15in/15in
1,600 x 1,200 at 75Hz	1,600 x 1,200 at 75Hz	1,024 x 768	1,600 x 1,200 at 75Hz	1,600 x 1,200 at 87Hz	1,024 x 768
SoftK56 modem, Logic3 Crusader Game Pad, Logic3 Star Fighter Joystick	Intel V92 modem	CXT1086 modem	Intel V92 modem	Systemax six-in-one media card reader	Intel V92 modem
Microsoft Works Suite 2003, Ahead Nero 5, Pinnacle Studio v8SE, Nvidia super games FX bundle	Ulead Videostudio6 SE, IBM Lotus SmartSuite 9.7	Intervideo WinDVD	Ahead Nero 5, Intervideo WinDVD	Ability Office, Power DVD, Power Director 2.1, Power VCR II, Videolive Mail 4	Intervideo WinDVD 5.1, Ahead Nero, Ability Office
3yrs on site parts & labour	1yr on site, 4yrs RTB labour	5yrs RTB (1yr parts & labour, 4yrs labour only)	1yr on site 2yrs RTB	1yr on site, 2yrs RTB labour	1yr on site, 5yrs RTB
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★



# Editor's Choice

**Y**ou only need look back at our last £699 PC group test – which we ran in the December 2002 issue – to see how much more the consumer gets for the same amount of money these days. Half of the PCs in the December group test were built around an Athlon XP 2200+ processor, and this was the fastest processor we saw. The featured hard disks ranged in size from 40GB up to 80GB, and only two of the systems had any more than 256MB of system memory.

Compare the average specifications of those PCs with those we have seen this month, and it becomes apparent that just six months later, your £700 will go that bit further. Intellect was the only manufacturer to build its system around a Pentium 4 processor and came up with a relatively speedy 2.4GHz chip, while the vast majority of the AMD-based machines were built around an Athlon XP 2500+ or higher. Most of the PCs on test featured 512MB of system memory and Mesh added some muscle to its system with a 120GB hard disk.

A quick glance at the lab results of these two groups tells a similar story. Last time around, none of our £699 PCs broke the 200 score barrier in Sysmark, with the Systemax PC coming the closest with 192. This time, only the ECS didn't make it past 200. You

**'In this group, above all, we were looking for well-balanced systems'**

have to bear in mind however, that when you buy a desktop replacement notebook or an all-in-one system, you are paying a premium for the space saving technology. If you buy an all-in-one at this price point, you can't expect the same specifications as you would find under the bonnet of a similarly-priced multi-part PC.

This month we also saw some impressive graphics processing performance, with the Poweroid scoring a massive 13,168 in 3Dmark, compared to the NEC's top score of 11,609 last December.

We were pleased this month to see some interesting features included in the systems that found their way to our labs. Of the 10 participating manufacturers, four managed



Watford Aries Performa Pro NF2



Mesh Matrix 2500+ FWD



Poweroid 3021

to squeeze a LCD monitor into their systems, which is good going at this price point. We were also pleasantly surprised to see Systemax include a six-in-one memory card in its system. At this price, however, the inclusion of too many flashy features is likely to call for cutbacks in other areas – the last thing you want is to open up your feature-rich PC to find a system interior that resembles Mother Hubbard's cupboard. So while features formed an important part of our assessment, above all we were looking for well-balanced systems.

## The winners

It is the **Watford Aries Performa Pro NF2** that gets the **Editor's Choice** award this month. It may not have outperformed the rest of the pack in the way that the Mesh or Poweroid did, but its system performance was consistently good.

The Athlon XP 2600+ processor, 512MB of system memory and Geforce4 Ti 4200 graphics card should be more than capable of dealing with whatever tasks you are likely to throw at a budget PC for some time to come. If you do feel the urge to upgrade, however, we liked the fact that the system interior is largely screw-free. We also liked the inclusion of both full-sized and mini Firewire ports in this system, which increases this PC's compatibility with any peripherals you may already have. Last, but by no means least, is that 15in LCD monitor, which will take up less of those valuable desktop inches that can be so precious in the home.

The **Mesh Matrix 2500+ FWD** is the first recipient of one of our two **Highly Commended** awards in this group test. This PC boasts truly impressive system performance, topping the Sysmark table this month. The Athlon XP 2500+ processor coupled with 512MB of system memory may be fairly standard features this month, but that 120GB hard disk clearly added some muscle to the system. The Mesh has some good connectivity on offer too.

Our second system to win a **Highly Commended** award is the **Poweroid 3021**. System performance was very good across the board and the Geforce4 Ti4600 blew the rest of the competition out of the water in our tests. Ultimately, the Poweroid has a good balance of quality components inside the case and the 15in Iiyama LCD is the icing on the cake.

Both the Systemax and the SNS, which made a successful PCW group test debut this month, also deserve mentions.

at this price  
it's a masterpiece



Overall "A stylish desktop PC"  
computeractive

Enjoy the freedom, appreciate the technology and admire the good looks of the new All-in-One LCD PC from Elitegroup Computer Systems.

The AiO's fully adjustable frame and flexible viewing angles allow everyone to enjoy the crisp LCD screen clearly and comfortably. The wireless Keyboard and mouse, along with a footprint no bigger than a laptop, gives you unrestricted PC use in any area of your home or office. Gone are the days of hiding your PC in a dark corner, the sleek angles and stylish design of the AiO will only enhance your environment.

Great looks are backed up by superb technology. The Intel® Pentium®4 Processor provides the power to speed through any workload, whilst the CD-RW/DVD-ROM Combo drive, high performance graphics engine and speakers make the AiO a superb home entertainment PC. The AiO also comes ready for Internet use with an onboard Modem and Ethernet Card.

ECS was established in 1987 and quickly grew to become one of the largest manufacturers of IT equipment in the world. Our research and development team is committed to producing high quality goods at exceptional prices. Simply plug it in and turn it on!

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<b>Processor</b>	Intel® Pentium®4 Celeron 2.0GHz	Intel® Pentium®4 2.4GHz 512 KB
<b>Memory</b>	512 MB DDR RAM	512 MB DDR RAM
<b>Hard Drive</b>	40 GB	40 GB
<b>Display</b>	15" 1024 x 768	15" 1024 x 768
<b>Video &amp; Graphics</b>	High performance 256bit 3D	High performance 256bit 3D
<b>Audio</b>	Two built-in high quality stereo, one sub-woofer	Two built-in high quality stereo, one sub-woofer
<b>Optical Storage</b>	CD-RW/DVD-ROM Combo Drive	CD-RW/DVD-ROM Combo Drive
<b>Ports</b>	4 x USB 2.0, 1 x VGA-in, 1 x IEEE 1394	4 x USB 2.0, 1 x VGA-in, 1 x IEEE 1394
<b>Internet Connection</b>	56K Modem, Ethernet LAN built in	56K Modem, Ethernet LAN built in
<b>Software</b>	Windows® XP Home	Windows® XP Professional
<b>Peripherals</b>	Wireless Keyboard & Mouse	Wireless Keyboard & Mouse
<b>Price</b>	<b>£699 ex vat</b> (£821.33 inc vat)	<b>£799.99 ex vat</b> (£939.99 inc vat)

Subject to availability, all prices and specifications are correct at time of going to press and may change without notice. E&OE

## The All-in-One LCD personal computer



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# Get the picture

WORDS & TESTING: NIK RAWLINSON ILLUSTRATION: VINCENT FRASER

Getting the most from  
your digital photos  
has never been easier.  
We test 11 of the best  
photo-editing packages,  
and round-up some top  
plug-ins and albums

**T**wo months ago we reviewed the best new digital cameras on the market. If that inspired you to go out and buy a new snapper then chances are you'll have a healthy crop of images in need of some attention, so this month we're looking at photo-editing software.

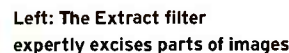
Taking 11 products from across the market there is something here for everyone, from simple picture organising and optimising tools like Paint Shop's Photo Album, to full-blown industry heavyweights like Adobe Photoshop and Macromedia Fireworks. The prices, as you'd expect, reflect the diversity of the products on test.

We have also taken our first serious look at Photoshop-compatible plug-ins, which can be used to extend the abilities of many of the applications reviewed here to produce some truly astounding results.

Throughout our tests we've kept ease of use and power in mind, with those products that strike a balance scoring highly. Not surprisingly, the general rule seems to be the more you pay the more you get, but this is not always the case – so be wary.

Whatever your budget, needs or abilities, then this group test – our biggest round-up of photo-editing software in 12 months – is the one-stop lowdown on making your photos look a whole lot better.





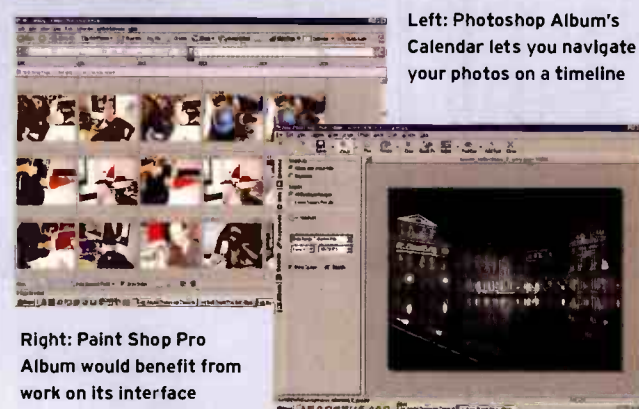


Simplicity is the watchword for Elements, which offers 'Recipes' and common-sense controls (below)

## Organise your pictures

If you're happy with the way your photos look already then you may prefer an easy way to organise and share them. This is where Adobe Photoshop Album 1 and Jasc Paint Shop Photo Album 4 come in, cataloguing your hard drive and adding quick links for emailing, printing or burning your photos to CD-Rom.

Adobe Photoshop Album 1 is the more polished product, despite the fact it is only a first release. Its interface is attractive and easy to navigate, packing an impressive amount of information into a very small space. Its killer feature is the chronological timeline across the top of the thumbnail window. Moving the pointer forwards and backwards across the bar jumps to photos taken in any given month. The Paint Shop equivalent is a search box that asks you to specify a date range and select a set amount of fuzziness from a dropdown menu along the lines of 'within one week' of this date.



Left: Photoshop Album's Calendar lets you navigate your photos on a timeline

Right: Paint Shop Photo Album would benefit from work on its interface

Both give the option of optimising images before sending them by email so when they arrive at the other end they are a more modem-suitable size with minimal loss of quality. Both have links to Shutterfly, and this is the service that Adobe uses for professional quality printing if you'd rather not use an inkjet. This is a shame as, being a US service, its prices are quoted in dollars, with a minimum charge of \$4.99 (£3.20 approx) for international delivery.

A key difference between the two is the time they take to set up. Adobe Photoshop Album had scanned our hard drives and catalogued anything that looked like a photo or a movie in under two minutes. Jasc Paint Shop Photo Album 4, on the other hand, took one hour, 50 minutes to do just one of our three drives, at which point we pressed the stop button.

The reason for this difference in working times is that, by default, the Adobe product ignores anything too small to be a photo, skipping program icons and web graphics, Jasc's offering, however, catalogues the lot, regardless of size. The result is a bloated catalogue that is not nearly as easy to navigate as Adobe's results.

### DETAILS

Adobe Photoshop Album 1

PRICE £34.08 (£29 ex VAT)

CONTACT Adobe 020 8606 4001 [www.adobe.co.uk](http://www.adobe.co.uk)

**SYSTEM REQUIREMENTS** Windows 98SE/ME/2000/XP; 128MB of Ram (256MB recommended); 250MB of free hard disk space; Internet Explorer 5.01 (with Service Pack 2), 5.5, or 6; colour monitor displaying thousands of colours at 800 x 600

OVERALL ★★★★★

Jasc Paint Shop Photo Album 4

PRICE £29.95 (£25.49 ex VAT)

CONTACT Digital Workshop 0870 120 2186 [www.digitalworkshop.com](http://www.digitalworkshop.com)

**SYSTEM REQUIREMENTS** Windows 98SE/ME/NT4/2000/XP; 64 MB of Ram (128 MB recommended); 120 MB of free disk space; 16bit display at 800 x 600 (1,024 x 768 or higher recommended)

OVERALL ★★★★★

## Adobe Photoshop Elements 2

While Photoshop may be the industry standard, its baby brother, Elements 2, will satisfy all but the most ambitious user, as it works in a similar way and shares many common features. Unfortunately, it can't handle CMYK images, but beyond image slicing, it has everything a web developer could want.

Ideal for the amateur digital photographer, Elements 2 features a quick fix tool that centralises several tweaking features, including rotation and colour correction. The less experienced user, meanwhile, will put the hints and recipes palettes to good use. These offer context-sensitive help and walkthroughs on commonly performed tasks.

All palettes can be docked in a well at the top of the screen. Clicking on their tabs drops them down to reveal familiar Photoshop navigator or layer interfaces, or less familiar examples of what each filter does, which should mean more to the novice user than entries on the dropdown filters menu.

Alongside regular graphical or text layers, Elements can also handle adjustment layers and layer masks for performing non-destructive adjustments across the entire image or isolating irregular sections. It will also stitch together multiple photos

to produce a single panorama, although in our tests this didn't perform as well as some of the standalone alternatives often bundled with a digital camera.

For the more ambitious user, levels can be adjusted manually, but there is no curve control. There are, however, sliding adjustments that simulate flash for silhouetted subjects, or an increase in background lighting to bring out dark scenery.

Photoshop Elements would be a good choice for the novice to intermediate user. It is powerful yet friendly, and with an interface close to that of the full-blown Photoshop.

### DETAILS

PRICE £69.33 (£59 ex VAT)

CONTACT Adobe 020 8606 4001

[www.adobe.co.uk](http://www.adobe.co.uk)

**SYSTEM REQUIREMENTS**

Windows 98/98SE/ME/2000/XP; 128MB Ram, 150MB of free hard disk space, colour monitor capable of 800 x 600 resolution, Internet Explorer 5 or above

**PROS** Mimics Photoshop; low price

**CONS** No CMYK support

**VERDICT**

Photoshop Elements 2 will suit most non-professional users down to the ground

EASE OF USE ★★★★★

FEATURES ★★★★★

VALUE FOR MONEY ★★★★★

OVERALL ★★★★★





Left: Almost every menu entry is accompanied by an illustrative icon

Below: Comprehensive and well thought-out dialogues help to win Corel another Editor's Choice



## Corel Draw Graphics Suite 11

It's extraordinary how much you get in the box when you buy Corel Draw Graphics Suite 11. Its various applications cover everything from web image design to barcode creation, and are supplemented by thousands of images, fonts and pieces of clip art. There's also an animation package that can export its output as Macromedia Flash files, guaranteeing compatibility with 497 million players around the world.

For this review, we'll be concentrating on Photo Paint, the image-editing element, but it's worth bearing in mind what else you get, and the fact that everything is cross-platform compatible, running under Windows and Mac OS X straight from the box.

Photo Paint is very easy-to-use. Almost every menu entry is accompanied by a thumbnail illustration of what it does. This is useful for new users who might not understand the difference between adjusting saturation or contrast. However, they remain discreet enough not to get in the way. A lot of thought has gone into navigation, with an application launcher featured permanently on the toolbar. This recognises and integrates other Corel applications, such as Word Perfect and Quattro Pro, but not the Open Office equivalents.

There is a great selection of filters, again accompanied by menu thumbnails that illustrate what each will do. Several produce 3D-like effects, such as edge curls or bevels that would take a lot of time to render using less specialised applications.

In a field where many applications over-complicate their adjustment tools, Photo Paint has kept things relatively simple. They are simple to navigate, and the controls on the most elementary tools have been kept simple and easy to understand. Tone curves, for example, can be dragged using the mouse, just as they can in Photoshop, and the brightness and contrast setting scales are again simple drag bars.

The web image optimisation tools match those found in Photoshop and Fireworks, cutting the time taken to shrink file sizes to modem-friendly proportions. Sadly, there is no browse functionality for finding images like that seen in Photoshop, Paint Shop Pro or Ulead Photo Impact, but the error-catching function makes up for this omission. This will take control of the application as it starts to fall over, giving you a chance to save your work before Windows steps in and wipes it out. In a professional

environment it could almost justify the cost of the application on its own.

Layers have been christened Objects, which makes more sense when you realise that you can define any object in the palette as a clickable section of an image map. This speeds up the creation of maps for online use, even if it does step away from the industry naming convention. Likewise, rather than adjustment layers, Photo Paint implements what it calls a lens. Again, this is logical when you consider that anything seen through it will be affected by its attributes.

Fortunately, for those who prefer to work by more traditional means, the image slicing tool works the same here as it does in other mainstream applications, complete with sticky zones to make for simple lining up of sections that will eventually form table cell tiles.

This idea of objects rather than layers has one major benefit. A single click of a button on the object's palette will promote a background image to the status of object, making it far more versatile to work with, and allowing you to adjust its opacity. In most competing products it would be necessary to duplicate the background layer and delete the

original before you could do the same.

With the ability to work in CMYK mode as well as RGB, and a cutout tool that mimics the Photoshop Extract filter, this really is the application that beats all others here, especially when you consider the bargain price. The Corel Draw suite is a mature application, and it shows. It takes a lot to knock Photoshop off the top spot, but in this instance cross-platform compatibility in a single box, a significant price undercut, an unsurpassed bundle and supreme ease of use have done it.

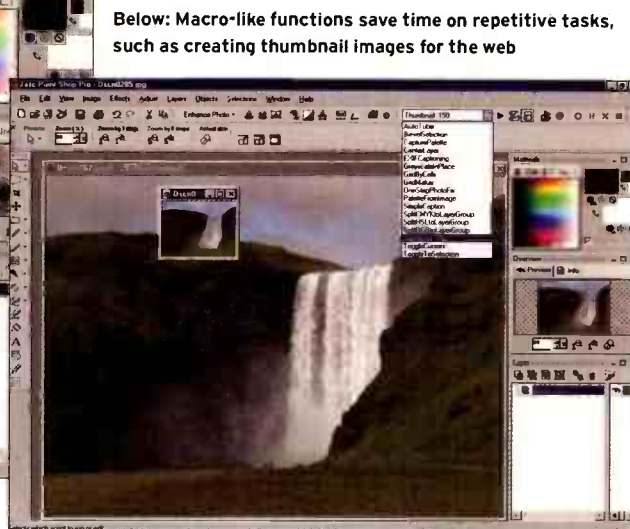
### DETAILS

**PRICE** £457.08 (£389 ex VAT)  
**CONTACT** Corel [www.corel.com](http://www.corel.com)  
**SYSTEM REQUIREMENTS**  
 200MHz or faster processor, Windows 98/ME/NT4/2000/XP, 64MB of Ram (128MB for Windows XP), 1,024 x 768 display, 200MB of free hard disk space  
**PROS** Great value; easy-to-use  
**CONS** Not the industry standard, so you may find yourself learning two applications if you're a pro  
**VERDICT**  
 Beats Adobe Photoshop purely in terms of value. Corel has put together a valuable suite here

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



Left: The Paint Shop Pro interface is easy to use with Microsoft Office-like dropdown menus



Below: Macro-like functions save time on repetitive tasks, such as creating thumbnail images for the web

## Jasc Paint Shop Pro 8

**W**hen you consider photo editing is all about creating an object of beauty, it's surprising how many of these packages are quite unattractive. It's a welcome relief, then, to come to Paint Shop Pro 8 with its well ordered and attractive menus that mimic the flat shadow-casting dropdowns of Office XP.

Like Photoshop and Ulead Photo Impact, it benefits from a browser, allowing you to preview thumbnails of images in their folders before they are opened. However, a less desirable factor is a tendency towards complexity. The histogram tool, for example, is combined with a very rigid curve control that is controlled through buttons rather than click-and-drag. In Paint Shop Pro this leaves the histogram swamped amid the accompanying controls.

Likewise, the colour balance option is not as automatic as it suggests, and you are left to do a fair amount of manual scale tweaking while you compare the original and resulting images. By default these images appear in very small windows, which can be enlarged. Oddly, although the option exists to preview many effects in real time on the original image as well as in these windows, it

is not activated by default. On a more positive note, photo enhancing options are located in a dropdown on the main toolbar rather than being hidden on a menu and, once you've found the setting that works best with your camera you can save it for future use.

Paint Shop Pro benefits from an excellent red eye reduction tool that effectively stamps a replacement cornea and iris over the original. This can be tweaked in terms of colour and size, and for pictures taken at an obscure angle, squashed into an ellipse or drawn by hand. Don't think it's restricted to use on human subjects either; there is a library to cater for animals too.

While Photoshop has actions, Paint Shop Pro has scripts, and a small selection is installed by default. These automate tasks, much like a macro, and are programmed by hitting record, performing the actions yourself and then saving the sequence of clicks and button presses with an easy-to-remember name. This saves time when it comes to repeating common tasks, such as optimising images for a particular printing process. Of the scripts shipped in the box we were most impressed by the one-click thumbnail creation tool, which is great for web designers. Less impressive on the web front

is Paint Shop Pro's image slicing and mapping tools. When designing a web layout in a graphics application you want to be able to perform such tasks on the original canvas, as you can in Photoshop and Fireworks. Here though, you must slice or map your image in a windowed dialogue box, and pan the picture around as you work. It does have quick slicing tools to split the image, or pre-existing slices, into regular sections, but while this saves time it doesn't make up for the clunky interface.

Like Ulead's Photo Impact, Paint Shop Pro can split an image into separate files for each of the CMYK colour channels, and, in common with the majority of the products reviewed here, will work with Photoshop plug-ins. However, text can't be typed or edited directly on the canvas, which is a shame as it was one of the big reasons for upgrading Macromedia Fireworks on the last release.

However, it does have excellent selective editing tools for lightening and darkening, burning, dodging and even applying hue and saturation adjustments with a brush. All of which make this one of the most versatile products on test, and enough is packed in to put it on a par with Photoshop and

Fireworks for flexibility. Layers can be collected together into collapsible groups, which helps greatly when working on busy files and, in an effort to keep the workspace tidy, image holders will automatically resize themselves to best accommodate your image as you zoom in and out.

In many respects, Jasc Paint Shop Pro 8 and Ulead Photo Impact 8 are very similar products. Paint Shop Pro's interface, though, is streets ahead, and for this reason we'd recommend it over the Ulead option.

### DETAILS

**PRICE** £99.95 (£85.06 ex VAT)

#### CONTACT

Digital Workshop 0870 120 2186  
[www.digitalworkshop.com](http://www.digitalworkshop.com)

#### SYSTEM REQUIREMENTS

Windows 98/ME/NT4  
SP6a/2000/XP (SP2 required for 98 users, SP1 for 98SE users), 128MB of Ram, 200MB of free hard disk space, 800 x 600 resolution display, IE 5

**PROS** Logical interface; good value

**CONS** A little complex at times

#### VERDICT

Worth the upgrade for existing Paint Shop Pro users

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



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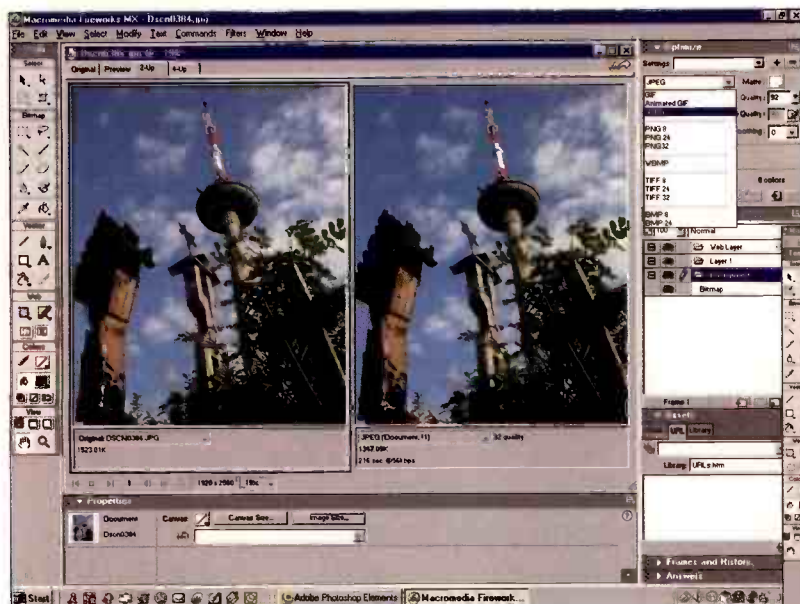
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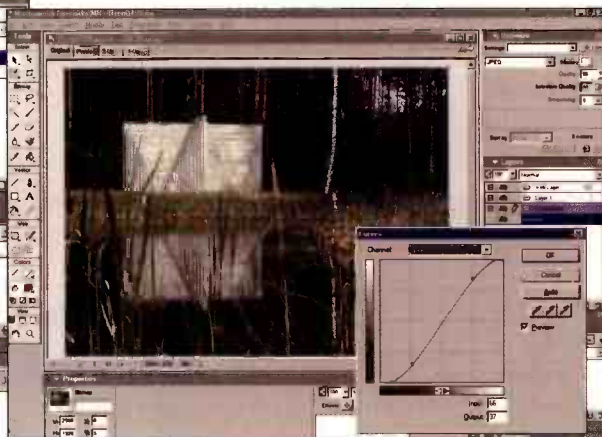
08708 503305





Left: Fireworks has unsurpassed tools to compress graphics destined for the web

Below: Simple controls like this level-adjustment curve make Fireworks easy to learn and use



## Macromedia Fireworks MX

**F**ireworks started as an image optimisation tool for shrinking pictures to Internet-friendly proportions. While it was possible to produce images from scratch, the tools at the users' disposal were nothing like those available today.

Built with the web developer in mind, it integrates well with a range of HTML editing tools, in particular, its sister product Dreamweaver. Using the two together you can take advantage of what Macromedia terms 'round trip' editing, whereby changes made to a file in Fireworks will be reflected in the same file when viewed through Dreamweaver, even if it's open at the time, and vice-versa.

The release of the MX edition, brings Fireworks a new interface, which matches that found in Dreamweaver, Flash and, to some extent, Freehand. At the same time, it's fully compliant with Adobe Photoshop plug-ins so you shouldn't have trouble switching between the two.

The two most striking changes in this release of Fireworks are the introduction of the Macromedia Property inspector and the improved text engine.

The Property inspector allows you to tweak any element on the canvas, regardless of whether it's a shape, layer,

vector image or photo, in one location. Always knowing where to go when you need to make changes saves time, especially as it means you can now change the colour and shadow effects of a part of your image without visiting two distinct palettes.

Of most interest to users of earlier editions will be the rewritten text engine. Previously it had been necessary to enter text in a dedicated window. It would then be dropped onto the page where it could be moved around, but resizing it or changing the font required a trip back to the editing palette. Now, though, text is created and edited in situ, so changes are reflected instantly.

Like Photoshop, Fireworks is extensible. Quite apart from being able to use Photoshop plug-ins, its open architecture means that an army of enthusiasts is developing new features that will integrate with the default menus, taking on the appearance of an original piece of the suite. This development is centred on Macromedia's Exchange site.

Fireworks has its fair share of tools for the serious web developer, and it automates a lot of otherwise time-consuming tasks. Graphical menus that drop down as the mouse hovers across them, for example, look

great on screen but are difficult to code, and equally difficult to tweak should the structure of your site change. It's therefore good news that not only have the menu creation tools been retained, but they've actually been improved, allowing for vertical fly-out, as well as horizontal dropdown menus and user-defined cell widths. In earlier releases, Fireworks would make the width decision itself, basing it on the length of the longest menu entry.

New to this release is the ability to combine a directory of base images with XML data to produce customised banners and graphics. For anyone running an ecommerce site with daily price changes, it's a simple matter of running the refreshed data through the software each morning and coming up with a brand new set of auto-generated graphics.

Like Photoshop, Fireworks organises your work across layers, allowing for non-destructive editing and rapid amendments should you change your mind half way through the creative process. Unlike Photoshop, though, its gradient fill tools could do with a bit of work. The gradient fill is perhaps of most use when one end of the gradient is fully opaque. However, while

Photoshop has a default setting for this, in Fireworks it is necessary to create your own solution by manually reducing one end of the gradient to zero per cent opacity before applying it to your work.

This is such a tiny niggle, though, and points to the fact that we couldn't really find anything we didn't like about Fireworks. It has moved beyond the realm of being just an image optimisation tool and, with the introduction of blur, smudge, burn and other functions, has now grown into a fully-fledged photo editing suite.

### DETAILS

**PRICE** £280.83 (£239 ex VAT)

**CONTACT** Macromedia

[www.macromedia.com/uk](http://www.macromedia.com/uk)

#### SYSTEM REQUIREMENTS

300MHz or faster processor, Windows 98SE/ME/NT4 with SP6/2000/XP, 64MB of Ram (128MB recommended), 800 x 600 display, 80MB hard of free disk space

**PROS** Ease of use; HTML facilities

**CONS** Suits the web developer better than the print publisher

#### VERDICT

Fairly pricey, but still the best option for web developers

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



A little more simplistic than its name suggests, Digital Image Pro has well illustrated menus

## Microsoft Digital Image Pro 7

Chapters two and three of the Image Pro manual are great for the amateur digital editor, with invaluable tips for getting the best from your camera or scanner. The program is similarly helpful, but after you've been using it for a while the constantly appearing and disappearing sidebar starts to irritate and detracts from the credibility of the word 'Pro' in this product's name.

We were surprised that an image editor should insist on installing IE6, or that there should be only two installation options – typical or full, requiring more than 200MB. A second disc of sample images and projects can fortunately be left aside until needed. We were, though, disappointed by the inflexibility of many of the photo-editing tools.

Image Pro has a simple layers system where elements can be dragged up and down the stack on the right of the screen, but cropping a document flattens it. Further, the tint adjustment function isn't much more than a variable white balance tool. Blurring and sharpening affects the entire image rather than just selected parts, and the adjustment brush tools are tucked away on the bottom of a fly-out menu where they are unlikely to offend a novice.

The interface feels like it has been built to suit the smallest of monitors with many tasks restricted to fairly rigid daughter windows. When adding a 'designer edge' to a photo, for example, the default window displays only six options out of 60 and while it is possible to fly-out the dialogue, a resizable dialogue would have been a more elegant solution.

The software can implement Photoshop compatible plug-ins, but this does little to salvage its appeal to the higher end of the market. For the novice, it's fine, and the price is fair, but for a little more money you can get your hands on a lot more power.

### DETAILS

**PRICE** £59.99 (£51.05 ex VAT)  
**CONTACT** Microsoft 0870 601 0100  
[www.microsoft.com/uk](http://www.microsoft.com/uk)  
**SYSTEM REQUIREMENTS**  
 300MHz processor, Windows 98/ME/2000/XP, 64MB of Ram, 205MB of free hard disk space, 800 x 600 display, Internet Explorer 6 (included)  
**PROS** Accepts Photoshop plug-ins  
**CONS** Limited installation options; rather simplistic  
**VERDICT**  
 Easy to use, but spending a little more for Photoshop Elements 2 will pay dividends

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



Photosuite's attractive interface will appeal to first-time users, but may limit those with more experience

## Roxio Photosuite 5 Platinum

Photosuite 5 really offers very little over the two 'Album' products (see page 127). It is billed as 'the complete photo solution, from capture to burning' but its main focus, apart from the burning, which builds on Roxio's heritage as a CD-writing software company, is on organising and annotating your photos.

Like both Album products, it catalogues your hard drive, arranging any photos it finds into albums derived from the names of the directories in which they are stored. Tasks are organised into four general areas, each one represented by a large button in the left-hand margin which, when passed over by the mouse, opens a new set of buttons in the main workspace that link through to the tasks in hand.

The interface is very attractive, decidedly non-Windows and likely to appeal to the novice user. Also of benefit to the novice would be the step-by-step nature of the activities. Default projects include poster, card and calendar creation, which should suit almost anyone. Unfortunately the online services, which are a chargeable extra, are not yet localised for use outside the US. We feel this is a missed opportunity in a product sold in the UK. Photos

can also be emailed directly from within the Photosuite interface and, should you desire, suitable levels of compression will be applied to save them clogging up a slow modem link. Very basic editing can also be performed, but this mainly revolves around corrective tasks such as removing red eye or realigning the colour balance, and little else.

In short, we'd recommend Adobe Photoshop Album 1 rather than Photosuite, simply because its indexing and navigation system is far more versatile. If you're after a more powerful editing tool, though, check out Serif Photo Plus 8.

### DETAILS

**PRICE** £49.99 (£42.54 ex VAT)  
**CONTACT** Roxio [www.roxio.co.uk](http://www.roxio.co.uk)  
**SYSTEM REQUIREMENTS**  
 Windows 95/98/ME/NT4 with SP3/2000, 166MHz processor (266MHz Pentium II recommended), 32MB of Ram, 800 x 600 resolution display in 24bit true colour, 200MB of free hard disk space plus 65MB space for IE and DirectX, IE 5  
**PROS** Easy to use interface  
**CONS** Little more than a catalogue  
**VERDICT**  
 A good effort, but Adobe Photoshop Album 1 offers more

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





Simple interface and easy-to-use adjustment layers earn Photo Plus a commendation



## Serif Photo Plus 8

**B**ehind the simple Photo Plus interface is a very powerful editing tool. With Photoshop-like layers and full curve control, combined RGB and individual colour channels it's getting close to semi-professional functionality. It even has a CMYK working mode, which puts it one step ahead of Photoshop Elements.

Its layer control, meanwhile, runs as far as adjustment layers for non-destructive canvas-wide changes to colour and lighting, including a channel mixer and even fairly advanced gradient map, while all layers have variable opacity. It also undercuts Paint Shop Pro to the tune of £30, posing a threat to its better known, more established competitor.

Add to this its timesaving innovations, such as the flood eraser that will mimic a selection wand and deletion combined to produce speedy cutouts, and you have a very desirable piece of software.

There are some strange quirks such as undo, which steps you back to your first action with the warp tool regardless of how many consecutive uses you've made of it, and the fact that text must be entered through a dialogue box rather than directly onto the canvas, but on the whole everything works as

you'd expect. Like Elements, it would be a good learning ground for anyone hoping to switch to a more professional alternative further down the line. It's also fully compatible with Photoshop plug-ins, so any investment made in this area can be transferred if you choose to upgrade in the future.

The Export Optimiser does far more than just save your image for the web – it will export as anything from Macpaint to png and the industry-standard Photoshop psd file format.

Photo Plus 8 offers a great level of functionality at a very keen price and is a worthy award winner in this group.

### DETAILS

**PRICE** £69.99 (£59.97 ex VAT)  
**CONTACT** Serif 0800 376 7070  
[www.serif.com](http://www.serif.com)

#### SYSTEM REQUIREMENTS

95/98/98SE/ME/NT4/2000/XP,  
32MB of Ram, 40MB of free hard  
disk space, 800 x 600 resolution  
display in 16bit colour or higher

**PROS** Good support for older  
versions of Windows

**CONS** A few quirks here and there

#### VERDICT

**A surprisingly versatile offering. Just don't let the unattractive interface put you off**

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★

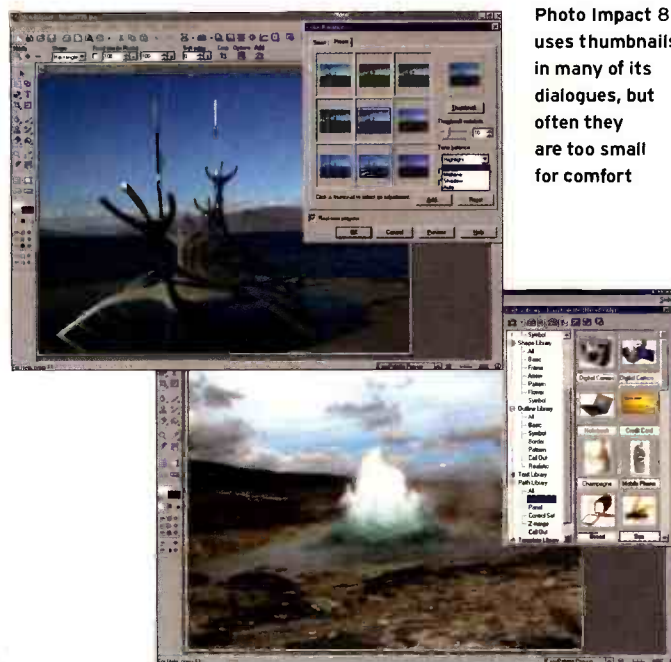


Photo Impact 8 uses thumbnails in many of its dialogues, but often they are too small for comfort

## Ulead Photo Impact 8

**P**hoto Impact is not one, but three applications that cover photo editing, gif animation and an Album organiser. This is not bad value, but the sheer complexity of the offering is likely to put off novice users. It feels like a revision of a revision where more thought has been put into the range of tasks than the way the interface works. We often found ourselves searching through the array of panels and unfamiliar menus to complete simple tasks.

Brightness and Contrast, for example, appear on a 'format' menu, and while the interface for this in Photoshop involves just two sliders and two input boxes, in Impact it entails the navigation of 10 thumbnails, four sliders, a dropdown menu, two tick boxes, seven buttons and four manual input boxes.

This use of thumbnails is common to several of the dialogues, but they are often too small to be of much use at resolutions higher than 1,024 x 768 as, rather than isolating a portion of your image, they cram the whole thing into a tiny area. Elsewhere other elements are half-hearted. There's curve control, but you can't simply drag the curve into new shapes – instead you must use inputs and incremental buttons, which gives very regimented results.

Despite this, there were many factors we did like. Dragging parts of a multi-layer image out of the editing window opens them as new documents, which makes for easy manipulation before they're dropped back into the original composition, and the ability to split an image into separate CMYK colour channels will appeal to pre-press users.

Impact understands Photoshop filters and has a useful browse manager that will display recently opened images and allows you to navigate your drives. However, these neat little touches don't make up for a complicated interface.

### DETAILS

**PRICE** £89.99 (£76.58 ex VAT)  
**CONTACT** Ulead 01327 844 880  
[www.ulead.co.uk](http://www.ulead.co.uk)

#### SYSTEM REQUIREMENTS

Windows 98/98SE/ME/NT4 with  
SP6/2000/XP, 64MB of Ram  
(128MB recommended), 500MB of  
free hard disk space, true colour or  
hi colour display adapter and monitor

**PROS** Powerful

**CONS** Complex interface

#### VERDICT

**Very similar to Paint Shop Pro in content, but a confusing interface loses it some points**

<b>EASE OF USE</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>VALUE FOR MONEY</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Photoshop plug-ins

Once there was a time when software products would boast about how different they were from the competition. Now it's the other way around, with the majority of the packages reviewed here proclaiming in a very loud voice how they comply with Adobe Photoshop plug-ins. A plug-in is a small application, unable to run under its own steam, that expands the functionality of the products into which it is 'plugged'. Usually they appear on the Filters menu, although there is nothing to say that they have to – again, it's just convention. It is impossible to pick out the best and worst plug-ins from a market of several thousand, but here we highlight three essential plug-in packs we promise will make your editing life easier and more creative.

## Knockout 2

The original Knockout was a ground-breaking product. It promised to put an end to long days of tedious, careful cutting out with a marquee tool or eraser.

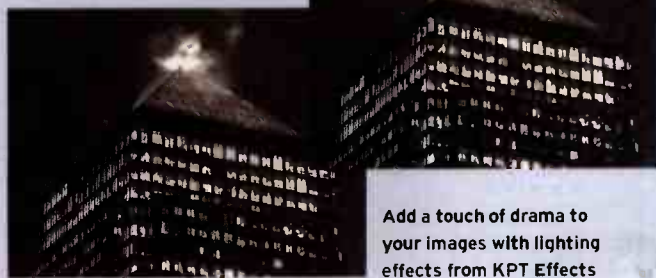
Instead, you would simply draw lines around the edge of the image part you wanted to retain, click the action button and sit back as it trimmed away the rest of the picture, dropping what remained of it back into the programme from which it was invoked.

Knockout 2 continues the theme, but while it performs a similar function to the Extract filter in Adobe Photoshop it is not nearly as easy-to-use. The Extract filter lets you simply trace the edge of your selection using a felt pen. The two sides of the line define the outer and inner edges of the selection, and it's easy to stop and start at will. Knockout also uses a pen, but it works in a similar way to the lasso tool, selecting a closed area that you must then add to or subtract from to get the right shape before either drawing a second line outside of the selection area or trusting the plug-in to work things out for you.

Results from this and the Extract filter are comparable, and so for a Photoshop 7 user we'd recommend sticking with the integrated filter. Any professional with other plug-in compatible software, though, will find Knockout 2 an indispensable tool.

## Mystical Lighting

Nine times out of 10 a successful photo is down to creative use of lighting. Just as common though, is having the window, sun or lamp in the wrong place. Mystical Lighting effectively corrects this problem, putting a whole arsenal of realistic light sources at your disposal. Recognising the fact that very few of us would ever take a picture of the light itself, software publisher Auto FX has concentrated instead on where the light lands, or the way in which it streams past objects blocking its path. Considering



Add a touch of drama to your images with lighting effects from KPT Effects

## KPTPYRAMID PAINT



The KPT plug-in is the king of the crop, offering great effects at a budget price

how realistic its results are, it is surprisingly easy to use, requiring just a few clicks on the proprietary interface, and a little time spent defining which parts of your image should block light and the direction in which the light should shine across the rest.

## KPT Effects

King of the crop is KPT, Kai's Power Tools. With nine effects engines that range from the unique 'lightning' filter, to the versatile but less exciting Pyramid Paint, which expands on Photoshop's watercolour filter. Each setting is almost infinitely adjustable, and based on real-life equivalents. The lightning tool, for example, deals not with length and breadth, but bolt strength, colour, and even age of the strike (lightning bolts grow relatively slowly to begin with, then rapidly diminish).

Other effects are more organic. The dropper emulates the spread of ink dripped into water or onto wet media. It leeches very naturally to give your images a slightly damaged feel. Fluid, meanwhile, acts in the same way a body of still water would if you ran your finger through it – the surface is smoothly disrupted, and the swell continues to take effect until you physically stop it.

Each of these plug-in kits performs a very different task, but if you're opting for just one or another we'd recommend KPT Effects. Its library of nine tools are a good starting point for any serious digital artist using a plug-in compatible editing package.

## DETAILS

### Procreate Knockout 2

**PRICE** £304.33 (£259 ex VAT)

**CONTACT** Procreate [www.procreate.com](http://www.procreate.com)

**SYSTEM REQUIREMENTS** Windows 98/ME/NT4/2000/XP, 200MHz or faster processor, Adobe Photoshop 5 or higher (or compatible host), 128MB of Ram, 30MB of free hard disk space

**VERDICT** We prefer Photoshop's Extract filter, but this is a useful tool for users of any other package. It's expensive, though

**OVERALL**

★★★★★

### Auto FX Mystical Lighting

**PRICE** \$179 (£114.02) – American prices not subject to VAT

**CONTACT** Auto FX [www.autofx.com](http://www.autofx.com)

**SYSTEM REQUIREMENTS** Windows 98ME/NT/2000/XP, 128MB of Ram, 30MB of free hard drive space

**VERDICT** Top notch virtual light casting. Mystical Lighting can turn a mediocre picture into something truly special

**OVERALL**

★★★★★

### Procreate KPT Effects

**PRICE** £75.20 (£64 ex VAT)

**CONTACT** Procreate [www.procreate.com](http://www.procreate.com)

**SYSTEM REQUIREMENTS** 166MHz or faster processor, Windows 98/ME/NT4 SP6/2000, Adobe Photoshop 4 or higher (or compatible host), 32MB of Ram (64MB recommended), 25MB of free hard disk space

**VERDICT** The king of versatile, consumer-friendly plug-in kits comes at a bargain price

**OVERALL**

★★★★★





## Table of features

					
MANUFACTURER	ADOBE	ADOBE	COREL DRAW	JASC	MACROMEDIA
PRODUCT NAME	PHOTOSHOP 7	PHOTOSHOP ELEMENTS 2	GRAPHICS SUITE 11	PAINT SHOP PRO 8	FIREWORKS MX
Telephone	020 8606 4001	020 8606 4001	None	0870 120 2186	None
URL	<a href="http://www.adobe.co.uk">www.adobe.co.uk</a>	<a href="http://www.adobe.co.uk">www.adobe.co.uk</a>	<a href="http://www.corel.com">www.corel.com</a>	<a href="http://www.digitalworkshop.com">www.digitalworkshop.com</a>	<a href="http://www.macromedia.com/uk">www.macromedia.com/uk</a>
Price inc VAT (ex VAT)	£569.88 (£485)	£69.33 (£59)	£457.08 (£389)	£99.95 (£85.06)	£280.83 (£239)
Layer support	✓	✓	✓	✓	✓
Auto levels	✓	✓	✓	✓	✓
Batch processing	✓	✓	✓	✓	✓
Twain input	✓	✓	✓	✓	✓
Plug-in support	✓	✓	✓	✓	✓
Clone brush	✓	✓	✓	✓	✓
Vector paths/objects	✓	✓	✓	✓	✓
Image browser/library	✓	✓	✓	✓	X
Image slicing	✓	X	✓	✓	✓
Online optimisation	✓	✓	✓	✓	✓
SCORES					
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

## Table of features

				
MANUFACTURER	MICROSOFT	ROXIO	SERIF	ULEAD
PRODUCT NAME	DIGITAL IMAGE PRO	PHOTOSUITE 5	PHOTO PLUS 8	PHOTO IMPACT 8
Phone	0870 601 0100	None	0800 376 7070	01327 844 880
URL	<a href="http://www.microsoft.com/uk">www.microsoft.com/uk</a>	<a href="http://www.roxio.co.uk">www.roxio.co.uk</a>	<a href="http://www.serif.com">www.serif.com</a>	<a href="http://www.ulead.co.uk">www.ulead.co.uk</a>
Price inc VAT (ex VAT)	£59.99 (£51.05)	£49.99 (£42.54)	£69.99 (£59.97)	£89.99 (£76.58)
Layer support	✓	✓	✓	✓
Auto levels	✓	✓	X	✓
Batch processing	✓	✓	X	✓
Twain input	✓	✓	✓	✓
Plug-in support	✓	X	✓	✓
Clone brush	✓	✓	✓	✓
Vector paths/objects	✓	X	✓	✓
Image browser/library	✓	✓	✓	✓
Image slicing	X	X	✓	✓
Online optimisation	✓	✓	✓	✓
SCORES				
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★
Features	★★★★★	★★★★★	★★★★★	★★★★★
Value for money	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★

# Editor's Choice

**A**s ever, we went into this group test with an open mind, but had an inkling that Adobe Photoshop 7 might walk away with our Editors Choice award. It is, after all, the industry standard professional photo-editing package, and is used in magazine and production houses throughout the world.

Put side by side with Corel Draw Graphics Suite 11, though, it just couldn't compete in terms of value for money. Both are incredibly powerful, yet easy-to-use products. Both read and write industry standard file formats, and both have a long heritage that means they are well known and well understood by a massive user base.

So, when you take away installation base and compatibility, all you are left with to compare the product are their features. As we said at the outset, the aim of this group test was to compare photo-editing software at all prices and for all users, but we just couldn't ignore the fact that while the photo-editing elements of Graphics Suite are both as powerful and easy-to-use as Photoshop, the range of complimentary products you get in the box adds significantly to the value of the whole.

None are the most common in their field, though, so if you are used to developing in Flash or Live Motion, for example, you're

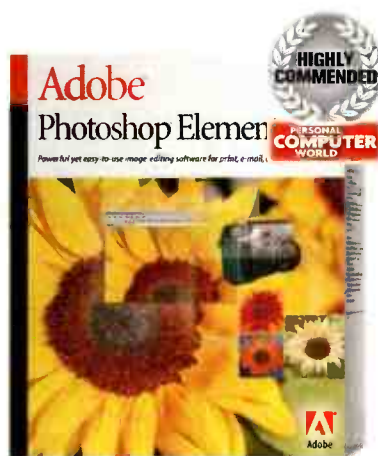
## 'Approach the market with an open mind, and opt for Corel'

going to have to learn some new skills for developing swf files in Rave, and if you're switching from Photoshop, or upgrading from Photoshop Elements, you're going to have to learn some new shortcuts and menu locations. It is obvious that a lot of thought has gone into the way these products work, though, and so it's not going to be long before you are discarding the shortcut reference cards and working from memory.

The helpful thumbnails on almost every menu entry in Corel Draw give visual clues as to what each does, and the dialogue boxes are simple and elegant. Only Corel suite, Photoshop, Photoshop Album and Fireworks among this group have been able to boast this level of elegance and power combined across their whole interface.



**Corel Draw Graphics Suite 11**



**Adobe Photoshop Elements 2**



**Serif Photo Plus 8**

## The winners

**Corel Draw Graphics Suite 11** may be an unexpected recipient of our **Editor's Choice** award, but it is thoroughly worthy of the accolade. We doubt it will be able to unseat Photoshop from its throne in the photo-editing marketplace, but for anyone hoping to break into the industry, or who wants to edit their photos with something a bit more professional than the software bundled with their digital camera it's a great place to start.

If you are not already tied into the Adobe platform and want to save some money, it is well worth approaching the market with an open mind and opting for Corel instead – just make sure you stick to psd, or generic tif and jpeg file types for maximum compatibility. When all is said and done, it's the quality of your work that matters – not what you used to produce it.

Our first **Highly Commended** award goes to **Adobe Photoshop Elements 2**. This cut-down edition of Photoshop offers everything the semi-professional editor could want at a bargain price. There is very little to distinguish this product from Jasc Paint Shop Pro 8, which, as we said in the review, could easily be threatened by Ulead Photo Impact 8 if the latter had a simpler interface.

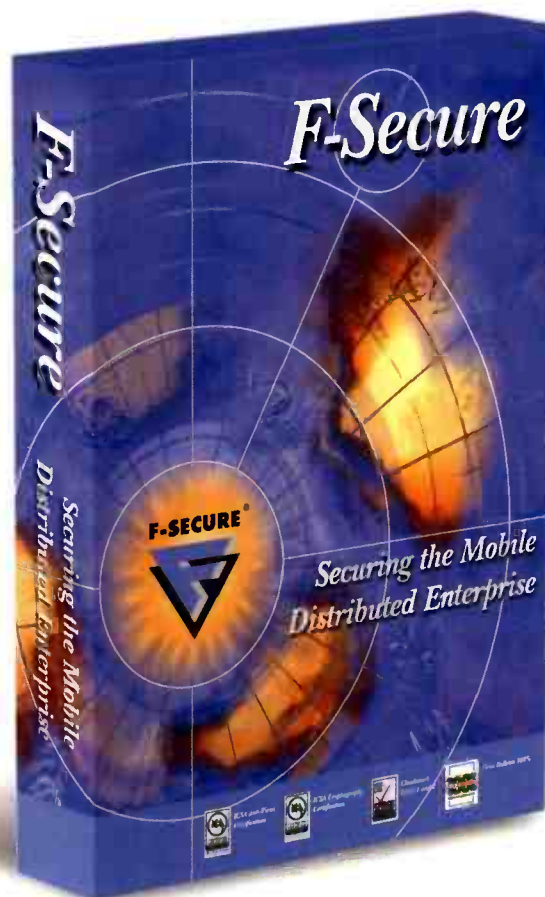
There is, therefore, a glut of very similar products around the middle of the market, and so again usability has a key part to play in differentiating between them. Photoshop Elements 2 just has the edge here, and its natural similarity to the full-blown Photoshop 7 makes it an ideal training ground for anyone looking to move into more serious photo editing, or for home users who might have the larger product at work and don't want to learn a brand new interface.

Dialogue boxes have been kept very simple, which makes it easy-to-use just as much of the product as you need and progress onto more ambitious tasks as you gain confidence. This is not something we feel we could say about Ulead Photo Impact 8, which we found daunting from the start.

Our final **Highly Commended** award is taken home by **Serif Photo Plus 8**. It may not be particularly attractive, but there is a lot of power hidden beneath its dowdy skin. Like all Serif products, its price is low, which should be enough to attract the dabbler for whom a more professional product would be overkill. It is quick to learn, beyond a few quirks, and should offer everything the novice user would need.



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# Capture the action

WORDS & TESTING: KEN MCMAHON PHOTOS: BRUCE MACKIE

Home movie-making has never been more affordable.

We test five top DV camcorders and the best video-editing software around to help get you started in film-making

**T**he price of digital video (DV) cameras has fallen to the point where it now makes no sense to consider an analogue model – assuming you could find one. Moreover, with budget DV editing programs, often including DVD authoring and burning software, costing around £50, it really is possible to set up your own digital video production suite on a shoestring.

This assumes you have a PC that's up to the task. Minimum system requirements aside, you'll need a 1GHz processor, 512MB of memory and a 30GB partition for video files to make the most of DV editing software. And for burning your finished projects you'll need a DVD writer, too – but all this kit has never been more affordable.

In this group test, we've evaluated five DV camcorders and four video-editing packages. Not all the camcorders are budget models; in fact, we've tried to include products that go beyond basic functionality and have something to offer the more experienced user. All the camcorders offer manual exposure and focussing modes, provide a card slot for digital still images and have a bi-directional Firewire port so you can record digital video output back to tape. Most of them also have analogue inputs so you can digitise all your old footage.

On the software side, we've picked three applications that concentrate on ease of use, but also offer advanced features and one, Adobe Premiere 6.5, that's squarely aimed at those with professional needs.





## Canon MVX2i

**C**anon's MVX2i is an updated version of the MVX1i. It's slightly smaller, the SD card is faster and the new model has what Canon calls 'network functions', so you can link two remote cameras connected to a PC through the Firewire port for video-conferencing and emailing.

This is a solid feeling camcorder and, while there are a lot of external buttons, it's logically designed and everything is at your fingertips when you need it. The palm grip swivels downward to a 45 degree position so you hold it with index finger on the side-mounted zoom, the remaining fingers wrapped round the front and thumb poised on the rear-mounted multi-function mode select and record button.

Given the number of controls on the rear panel your thumbs are going to be kept busy. A Program selector button switches between point-and-shoot operation and Program AE mode. The latter offers nine menu-selectable auto exposure modes, including sports, portrait, sand and snow and night shooting.

There's a switch for choosing tape or card and you can record 12.5fps mjpeg video at a resolution of 320 x 240, or still images up to 1,280 x 960 on the 8MB SD card supplied. There's also a full range of options for transferring and mixing video

and images between tape and card – though this kind of editing is much easier on a PC.

At the bottom of the back plate is a four-segment panel which is used to select and apply digital effects, operate in manual exposure mode and select manual focus, nor is it short of connections. Under a cover on the right you'll find an external mic socket, composite and S-Video in/out sockets, making it possible to record from an external analogue source such as a VCR or analogue camcorder.

Picture quality is first rate, while the autofocus, auto white balance and auto exposure produce excellent results in a variety of conditions, and the optical image stabiliser works very well.

### DETAILS

**PRICE** £864 (£735.32 ex VAT)  
**CONTACT** Canon 0800 616 417  
[www.canon.co.uk/digitalcamcorders](http://www.canon.co.uk/digitalcamcorders)  
**PROS** Built-in flash; good photo quality; features  
**CONS** Bottom loading  
**VERDICT**  
 Solidly built camcorder with a good range of features and excellent performance for moving and still pictures

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★



## JVC GR-DVP9

**T**he JVC GR-DVP9 is a masterpiece of miniaturisation. An update of the DVP7, this model features a bigger 1/4in 1.33megapixel CCD, providing better low-light performance and a maximum still image resolution of 1,600 x 1,200.

It's no looker mind you – a black rectangular slab with a curve quotient approaching zero – but it has some nice design features. The front plate, for example, doubles as a vertically sliding lens cover. The thumb-activated power switch and mode selector also function as a zoom rocker and VCR control, and when the LCD panel is closed and the viewfinder retracted the camera switches off.

Looks aside, the only design feature we didn't like were the membrane-style menu buttons behind the LCD panel, which need to be pushed quite hard.

The monitor brightness controls are used to scroll through menu items, which can be quite a tedious process on long lists. The D.sound button on the rear panel, which adds an mp3 sound effect from the SD card to a video while shooting or editing, is more of an irrelevance than anything.

Picture quality is excellent and, although the camera makes an audible hum, this wasn't picked up by the top-mounted

stereo mic during our tests. The digital image stabiliser is very solid, but best switched off when panning or shooting subjects with a lot of movement.

A single socket provides S-Video and AV in/out ports, and the USB port can be used to transfer still images and mpeg4 video from the SD card, though you'd be better off with a card reader.

There are some nice software features. DV navigation stores thumbnails on the SD card at index points in the video, which you can later use to quickly locate specific shots on the tape. The recording mode limits each clip to five seconds, which is a sure fire way to cut down on editing and make your videos shorter and more interesting.

### DETAILS

**PRICE** £744 (£633.19 ex VAT)  
**CONTACT** JVC 0870 330 5000  
[www.jvc.co.uk](http://www.jvc.co.uk)  
**PROS** Compact; high still picture resolution; DV navigation  
**CONS** Awkward menu buttons  
**VERDICT**  
 Features haven't been sacrificed for compactness, and the GR-DVP9 out-performs many of the larger models we tested

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Panasonic NV-DS65

**P**anasonic camcorders have changed little over the last three years, other than getting smaller. The basic layout remains the same, with a side-loading cassette mechanism, rear-mounted Li-Ion battery, foldout 2.5in LCD panel, and extendable, angled viewfinder.

The viewfinder is mono, which, along with the expanse of plastic, gives this model a budget feel. But the build quality is good and there are one or two interesting features such as the integral LED movie light, which provides sufficient illumination to light close subjects in dimly lit rooms, and the directional zoom mic.

Four buttons on the left-hand side activate the light, colour nightview mode, backlight exposure compensation and fade. But controls for switching between auto and manual focus and exposure modes and the digital image stabiliser are behind the LCD panel, which is awkward if you happen to be using the viewfinder.

Picture quality is good, and the autofocus performed well, even in low light conditions. The digital image stabiliser is an all-or-nothing affair that keeps the image rock solid, provided you have a reasonably steady hand. This is in contrast to the Samsung VP-D590i, which converts jerky movements into smooth ones and produces

better results when panning, which looks jittery here.

Panasonic hasn't changed the still picture resolution, which is a hugely disappointing  $640 \times 480$ . Still images, but not video, can be recorded on the supplied 8MB SD card and options for cross-dubbing are limited to recording still images to the card from the tape. While we've always considered features like in-camera Chromakey compositing a bit gimmicky, the lack of card features combined with the poor still picture resolution makes the SD slot rather superfluous.

The AV and S-Video ports are outputs only, so this is not the camcorder to choose if you're planning to convert all your old analogue footage to DV.

### DETAILS

**PRICE** £465.88 (£396.50 ex VAT)

**CONTACT** Panasonic 0870 535

7357 [www.panasonic.co.uk](http://www.panasonic.co.uk)

**PROS** Inexpensive; good build quality; integral LED movie light

**CONS** Low res for still pics; no way to record video to the SD card

### VERDICT

**Amazing value for a camcorder with SD card functions; a shame the card's not put to good use**

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★



## Samsung VP-D590i

**O**n paper, the Samsung VP-D590i looks impressive. It's a compact camcorder with a 10x zoom lens, point-and-shoot and manual capability, MiniDV and Memory Stick media, and bi-directional DV and analogue video ports. But in the flesh Samsung's flagship model is a bit of a let down.

To begin with, there's the shape – a rectangular brick that needs both hands to hold it securely and comfortably. You could always use the bolt-on handgrip, of course, but that adds to the overall weight and bulk, and you need to remove it to change tapes.

A lens hood is always a good idea, and Samsung supplies a neat little silver one, but once fitted, you can't attach the lens cap. The Li-Ion battery rattled around in its mounting, though the connection was good and there were no power problems.

The LCD panel rotates through 180 degrees for self-recording, but there's no mirror mode so positioning yourself in the frame is confusing.

This is all minor stuff, but it can make a difference. A more serious limitation is the 800,000 pixel CCD, which provides a maximum still image resolution of  $640 \times 480$ . With megapixel CCDs becoming the norm, this won't cut it with anyone

who intends to use their camcorder as a backup digital camera. The LCD image is dim and difficult to see outside, even on an overcast day, and the transport mechanism had a distinctly audible whirr – which was picked up by the mic in our tests.

On a more positive note, AE programs, manual exposure and focus modes and other features were easy to access and operate and there are dedicated buttons for easy and custom modes.

The backlit VCR controls look good and double up as fade, backlight compensation and picture search in camera mode. Essentially, though, what could be a great value high spec camcorder is let down by questionable design decisions.

### DETAILS

**PRICE** £546.01 (£464.68 ex VAT)

**CONTACT** Samsung

Opto-Electronics 020 8232 3280

[www.samsungelectronics.co.uk](http://www.samsungelectronics.co.uk)

**PROS** Ease of use; custom mode

**CONS** Poor design; dim LCD panel; low resolution stills

### VERDICT

**The low resolution CCD and LCD are disappointing and some design oddities need ironing out**

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★





## Sony TRV33E

**T**he TRV33E is at the top end of Sony's redesigned consumer camcorder product line-up. PCW managed to obtain the first model available for review in the UK and we're very impressed.

The slimmed-down, squarish design fits comfortably into the palm with a thumb-operated mode selector and record button alongside the battery at the rear. All the ports are hidden behind pull-out panels and the lack of external buttons (all menu functions are operated via the touchscreen LCD) make for a clean, unfussy design. The built-in stereo mic is sensibly located at the front and the hinged lens cap is another example of intelligent design.

The megapixel CCD provides still images on the memory stick up to 1,152 x 864 pixels and mpeg1 video. Sony has improved on its Super Steady Shot image stabiliser and this is one of the best features – producing images at the maximum 10x optical zoom range, as well as smooth panning shots. As well as the usual program AE modes, the camcorder has manual exposure and focusing, but Sony has dropped the manual focussing ring. It has to be said, manual focussing using touch screen controls on an LCD panel is not the most intuitive operation. Thankfully, the TRV33E features

Sony's spot focussing system which allows you to specify the area of focus by touching the screen, and this works very well.

In VCR mode the touch screen works a treat, it's fast and responsive. One drawback, however, is that the screen quickly becomes grubby, and you'll need to make frequent use of the supplied cleaning cloth.

Other features include true anamorphic 16:9 recording, as opposed to simple blanking of the top and bottom screen areas, Super Night Shot mode, time lapse and stop-motion recording.

Although it won't appeal to those with professional needs, the TRV33 is a star buy for amateur videographers looking for high-end video features and good still image resolution.

### DETAILS

**PRICE** £589 (£501.28 ex VAT)

**CONTACT** Sony 08705 111999

[www.sony.co.uk](http://www.sony.co.uk)

**PROS** Touch screen controls; build quality; high still image resolution

**CONS** Touch screen gets dirty; no manual focussing lens ring

### VERDICT

For the money, you won't get a 'point-and-shoot' camera with a higher spec or better build quality

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★

## How to shoot better movies

While it's true that editing will greatly improve your movies, adopting a few simple techniques at the shooting stage can also raise the quality of your footage – and save you a lot of work later on.

If you're lucky, interesting things happen in front of you and all you need to do is press the record button and capture it raw. But more often than not you have a bit of time to think about how to compose the shot.

If you have the time and you know the location, draw a storyboard with the main shots in sequence. If not, try and visualise a storyboard in your head.

Remember, you're trying to tell a story with events unfolding. Rather than just assembling a sequence of pictures, divide your movie into shots and keep the action moving by limiting them to around five seconds each, and varying the angle and width. If you pan the camera from side to side, you should avoid making cuts and edits during the pan. Again this is something you'll have to think about when shooting, so pace your pan to avoid over-long sequences in your finished video.

Long shots, taken with the camera on its widest angle setting, make good introductory sequences, and panning the camera will enable you to encompass a wider view.

Use the zoom to frame your shot prior to pressing record, rather than zooming in and out during filming, you can then fill in the detail with close-ups.

If you can, take a tripod. It will keep the camera steady and make your shots look more professional. It will also give you many more opportunities to appear in shot.

If you don't fancy the prospect of carrying a full-sized tripod, you can get mini-tripods that are light, small and relatively inexpensive. Failing that, walls, cars, or any other surface where you can rest the camcorder will improve stability.

### Manual exposure and focus

Don't be afraid to turn off the auto exposure and autofocus. In some circumstances manual settings will provide much better results and always give you more creative options.

Use wide aperture settings to reduce the depth of field and focus on your subject while blurring distracting backgrounds, and use slow shutter speeds to create intentional movement blur.

You could also experiment with the exposure controls to find the best settings for unusual lighting conditions – 90 per cent of the time the camera does a good job, but there are occasions when you need to take control.

### Sound

Because a camcorder's built-in microphone is inevitably closer to the camera than the action, sound quality is often poor. Another problem that affects all mics is wind noise. Every DV camcorder in our group test has a wind cut feature, which will alleviate this problem to a degree.

Many DV camcorders have a socket for an external mic so, if you can't keep out of the wind, use an external mic with a wind shield. Failing that, shield the mic with your hand to prevent the wind striking it, though this will obviously reduce its effectiveness somewhat.

### Watch TV

For good examples of how to shoot and edit short movies, watch your local TV news. Forget about the content, and pay attention to how the piece is filmed and edited.

Notice how the shots are never longer than a few seconds, how the width of the shots and the angle changes, how live sound is mixed with voice-overs and the entire piece rarely lasts more than a couple of minutes. With video, it's definitely a case of less is more, and this is equally true of transition effects. Most edits are straight cuts, so don't go mad with wipes and fades.



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code: 60196



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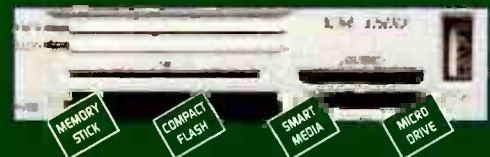
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- GeForce 4 64MB DDR graphics card with TV-Out
- 48x CD-Rw CD-Rewriter/CD Copier Drive
- 16x DVD-ROM Drive
- 1394 Firewire x2 and USB 2.0 x4
- 6 Channel advanced sound
- 17" SVGA screen (16" visible)
- Excludes ConnectPLUS front panel system

Code 60259

**£609** +VAT

**£715**.58 Inc. VAT

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XP2600+

- AMD Athlon XP2600+ Processor
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- 6 Channel advanced sound
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TIM0703





With its professional timeline editing features, Premiere 6.5 is well suited to the more ambitious user



## Adobe Premiere 6.5

**P**remiere is to video what Photoshop is to photography, a fully-featured professional editing application with tools – and a steep learning curve – to match.

Version 6.5 was released late last year, and it introduced a superb new title designer, Premiere's own realtime preview and an mpeg2 export plug-in, which uses the Mainconcept mpeg encoder for producing DVD-ready video.

Premiere doesn't have integral DVD authoring facilities, but does include a limited edition of Sonic Solutions DVDit. Now Adobe has released its own DVD authoring application, Encore DVD, it will be interesting to see if future versions of Premiere integrate Encore, as Image Ready works with Photoshop.

Although it's aimed more at professionals and serious amateur videographers, Premiere has made some concessions to ease of use with the storyboard and automate-to-timeline features. These enable you to import clips, arrange them, then automatically position them in sequence on the timeline with a default transition between each one.

The titling editor leaves other titlers standing. As well as providing straightforward tools

for standard titling and caption jobs, like rolling and crawling titles, it also includes a good selection of templates, as well as the kind of control over typography that you would expect from the company that developed Postscript.

The performance of Premiere's realtime preview is largely dependent on your hardware, but in our tests on a 2GHz Pentium 4 with 512MB of Ram and a dedicated AV drive it managed pretty well – providing a reasonably good quality preview with no dropped frames in all but the most demanding circumstances. But where there's a lot of motion going on and multiple layers with alpha transparency – as with rolling and crawling titles – it all starts to get a bit jumpy.

Another limitation of Premiere realtime is that you can't scrub the timeline and preview effects and transitions without first rendering them. As this is one of the biggest benefits of realtime editing this is a bit of a disappointment.

Allied with some DVD editing hardware, Adobe Premiere is even more of a winner. Take the Matrox RT.X10 realtime DV editing card, which includes the full version of Premiere and a lot more besides, but costs

around £75 less than the software alone. The RT.X10 offers a range of extra options like an array of 2D and 3D digital video effects and transitions, analogue capture and playback to an external monitor or TV, and single-pass automatic batch capture from DV tape. But it is demanding in terms of hardware specs – you'll need a 2GHz plus processor, separate AV drive and 256MB of Ram.

The RT.X10 also allows you to scrub the timeline in realtime, but adds a much broader array of effects and transitions to the Premiere set. If you like in-your-face transitions you won't be disappointed. It includes the Matrox selection of page curves, wavy dissolves and organic wipes, which were tailor made for fast, high-octane editing and are ideally suited to live music, sports and similar action-packed content. And if they don't do what you want there is great scope for keyframed customisation.

Though crucial to achieving professional results, sound is often overlooked in video editing applications, but Premiere can no longer be accused of this failing. The audio mixer automatically records and sets mixing levels applied on-the-fly during live playback, and three new audio filters have

been added, providing reverb effects, noise elimination and boosting audio recorded at very low levels.

If your interest in video goes no further than a desire to record home movies to DVD interleaved with a few simple transitions, then Premiere is probably not for you. To really make the most of it you'll need fairly muscular hardware and a little time and effort to learn the basics. But Premiere really isn't that complicated and, once you've mastered the basics, the tools are there to accomplish pretty much any editing task you can throw at it.

### DETAILS

**PRICE** £522.88 (£445 ex VAT), or Matrox RT.X10 including Premiere 6.5 – £445.32 (£379 ex VAT)

**CONTACT** Adobe 020 8606 4001 [www.adobe.co.uk](http://www.adobe.co.uk)

#### SYSTEM REQUIREMENTS

(RT.X10) 2GHz Pentium 4, 256MB of Ram, Windows XP, 500MB free hard disk space, separate AV drive

**PROS** Unsurpassed editing control

**CONS** Steep learning curve; pricey

#### VERDICT

The only sensible choice for professional PC editors

EASE OF USE	★★★★★
DOCUMENTATION	★★★★★
FEATURES	★★★★★
OVERALL	★★★★★



A wide variety of transition effects can add interest to an otherwise dull presentation, if used with care

## Magix Video Deluxe 2 Plus

**M**agix Video Deluxe 2 Plus, if the price and interface are anything to go by, is aimed at the home and occasional video editor. Like Ulead Video Studio, it keeps things simple by providing practical tools to carry out editing tasks without too many complicated options. But, if you want to go further than simply piecing together a few clips and adding transitions, it also offers many advanced features.

The DV capture module worked like a dream, capturing footage with automatic scene detection, dividing it into 'takes' and placing the takes in sequence on the storyboard in a single pass. If you attempt to capture video with a break in the timecode, most applications will give up or get very confused. Magix just carried on regardless, taking everything in its stride.

The interface is neat and uncluttered, with a preview window, storyboard/timeline window and a tabbed 'media pool', in which clips, titles, transitions and other effects are organised. To add effects and transitions you just drag and drop them from the media pool onto the relevant clip.

In storyboard mode, each take sits in a little clapperboard thumbnail, which can be dragged around to change the

order of play. A text button on the thumbnail launches the title editor and there are also buttons for controlling the overall audio level and adding effects filters.

Switching to timeline mode displays 32 tracks which can hold audio or video. There are sliders to control alpha transparency on the video tracks and audio volume, but these are restricted to fade-in/out at the beginning and end of clips. Each track also has a mute and solo button so you can turn it off or view it in isolation.

Magix has some excellent quick-fix filters for improving poor quality video and audio. The picture restoration panel provides tabbed palettes with slider controls for adjusting brightness and colour, and filters for sharpening and removing interlace artefacts.

The audio cleaning panel allows you to remove motor noise and hiss from recordings using either preset samples for a range of models, or your own sampled audio file. There's also a ten-band graphic equaliser, a dynamic range compressor and stereo FX tab. But if you really like to experiment with sound you should check out the mixing desk and master audio FX rack, which displays the graphic equaliser, stereo FX controls, reverb and echo

effects in an analogue-style rack.

It looks great and is a fun way to tweak audio and add effects, but what this really needs is some kind of dynamic control, so that effects can be applied in real time to the audio track as it's played.

The same could be said for the video effects. The realtime visual FX editor provides a central preview window around which is arrayed a selection of effects filters and controls. The optical effects include lens distortions, mosaic, blur, echo and emboss, sand and other effects.

There's also a fast/slow motion control, zoom control, rotate and position nudge buttons, a mixing panel for transparency effects, and some weird and wacky colour effects. The latter include a posterisation slider, colour adjustment sliders and a mirror effect filter called caleidoscope – perfect for that *Bohemian Rhapsody* look.

While there's a lot of effects to choose from, the package could do with some sort of keyframe feature to make them more flexible. Keyframed animation of both these effects and the audio mixing and effects must be a priority for the next release.

Having said that there's lots to like about Magix Video Deluxe 2 Plus. The effects may lack keyframed animation, but

one advantage of this is that they all play back, if not in real time, then very close to it, even where there are overlapping tracks with alpha transparency.

As well as its robust capture and easy-to-use editing tools, there's also DVD authoring tools available here, making Magix an excellent all-in value for money package. For a product that's only reached version 2 of its development cycle, Magix Video Deluxe is an incredibly mature and feature-rich application that won't fall by the wayside as users gain editing experience and want to tackle more ambitious projects.

### DETAILS

**PRICE** £59.99 (£51.05 ex VAT)  
**CONTACT** Fasttrak 01923 495 496  
**www.fasttrak.co.uk**

**SYSTEM REQUIREMENTS**  
400MHz Pentium II, 64MB of Ram (128MB recommended), Windows 98SE/ME/2000/XP, 300MB of hard disk space (1GB for video files)

**PROS** Well designed interface; ease of use

**CONS** Lack of keyframeable video and audio effects

**VERDICT**  
Great value all-rounder with something for users at all levels

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★





Simple controls make Videowave 5 a good choice for the first time user, though preview facilities are poor

## Roxio Videowave 5 Power Edition

**L**ike Video Studio, the Videowave software was one of the first products to cater for digital camcorder users who want simple tools for home editing. It was acquired by Roxio when the company took over MGI last year.

When it first appeared, Videowave's simple interface and powerful special effects filters made for an impressive budget package, but despite several upgrades and the addition of DVD authoring tools it hasn't travelled very far and has the feel of an application that's been bolted together and patched up, rather than designed from the ground up.

Despite that, with a little bit of effort there's everything here that you need to take raw DV footage and turn it into something entertaining. Like Video Studio, Videowave divides the movie-making process into discrete steps and provides editing modes in which each of these is accomplished.

Capture from a DV camcorder is simple enough and Videowave can automatically split scenes on the basis of content by detecting changes in the brightness level, though this is a two stage process – first the video is captured to disk, then the scene detection does its stuff. Rather than produce a separate avi file for

each scene, Videowave creates clip duplicates within the application and sets the in and out points to the scene's start and end. This saves space on your hard drive, because there is only one master clip, from which all of the scene clips are referenced, but it does mean that if you were planning to use the clips in another application you'd have to resave them individually.

Videowave uses a storyboard, which runs along the top of the workspace above the library and preview windows. Clips are dragged from the library onto the storyline and transitions placed between them, then further adjustment of transitions and effects is achieved using sliders and radio buttons in the panel below.

Several storyboard templates are included for situations in which you are likely to find yourself with camcorder in hand, including wedding, birthday, company overview and field trip. Rather than including content, these are actually simple text descriptions, providing shot selection guidance – 'close up of blowing out candles' or 'wide shot of applauding guests' and so on. This makes a change from the usual stuff, but as with most things in Videowave, it requires you to come up with the ideas and the content.

The lack of a conventional timeline on which you can superimpose several video and graphics layers means that this function has its own mode, called the video mixer. As well as creating dissolve transitions, this can be used to produce animated picture-in-picture effects and Chromakey overlays, where elements of the overlaying video, such as the background, are made transparent.

DVD authoring is carried out in a separate application, launched by pressing the 'author DVD' button. Before you do this you'll first need to export your project as an mpeg2 file. The 'Produce video' mode provides a preset for this as well as for VCD, and Real audio and wmv web streaming formats.

The exported file is added to the library, from which you can access it in the DVD authoring application. The process of creating and linking menus, adding clips and inserting chapter points is less than straightforward and requires perseverance. For one thing, though all the necessary components are supplied, there are no templates, so you need to build everything from the ground up. This is quite hard work and if Roxio were to provide a few basic templates with the application, or on its

website, it would make the process a lot easier.

Preview facilities, an absolute must-have for DVD authoring, are also poor and, even though the cost of DVD media no longer means that mistakes require a second mortgage to do them again, you'll probably want to preview projects in a software DVD player before burning to disk.

With Videowave it's very much a case of getting out what you put in. If you're prepared to spend time learning the interface and setting up DVD menu structures you can achieve great results.

### DETAILS

**PRICE** £69.32 (£59 ex VAT)  
**CONTACT** Roxio  
[www.roxio.de/english/home.php3](http://www.roxio.de/english/home.php3)  
**SYSTEM REQUIREMENTS** PIII 800MHz processor, 64MB of Ram (128MB recommended), Windows 98SE/2000/ME/XP, 110MB hard disk space (extra for media files)  
**PROS** Good selection of effects  
**CONS** No timeline; lack of integration between components  
**VERDICT**  
 Requires a lot more effort than other entry-level packages to get good results

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★



In spite of its low price, Video Studio 7 still offers a range of advanced features and an uncluttered interface



## Ulead Video Studio 7

**U**lead Video Studio 7 is aimed at the amateur videographer who wants to edit out the bad bits from home camcorder footage, add some transitions and titles and produce watchable home movies, without spending the entire weekend on it. Equally, small organisations like schools, clubs and even small businesses could use it to produce successful promotional videos.

The key to Video Studio's success is ease of use. In a recent PCW group test of video-editing software, Video Studio was the only application with which we were able to capture, edit and output to DVD a short video project without constant reference to the documentation.

This is partly due to the way Video Studio splits the job into separate processes. These are accessed in sequence, or any order you prefer, from tabbed palettes at the top of the screen. First capture your video from the camcorder, then edit it, add effects and overlay video and graphics, produce the titles, add a music track, dubbed narration and other audio, and finally share on DVD, the web or a variety of other formats.

At each stage of the process only the tools for the job in hand are displayed, so there's no clutter and you don't have to go

on a menu hunt to find what you need. There are three capture modes – manual, batch and scene detection. The last of these automatically detects shots using the time and date information, so that you get one short clip for each shot you made, rather than a one-hour 14GB monster file with the entire contents of the tape.

If you plan to record your movies onto VCD or DVD, Video Studio can transcode them at the time of capture. While this adds to the time required for capture, it means that your clips are already in mpeg format on the timeline and the DVD-producing stage is much quicker. In practice, this worked very well, with transcoding working in real time – a five minute clip took five minutes to transcode. If most of your source material is going to end up on a disc, this is definitely the way to do it. If you plan to do a lot of editing, though, the transcoding is best left to the pre-burning stage.

There are preset options for VCD, SVCD and DVD, and these can be tweaked if you have sufficient knowledge of the encoding parameters to make it worthwhile, though if this were the case you probably wouldn't be using Video Studio 7 to do your transcoding.

The workspace is clearly laid out and unimposing. A massive, resizable preview window in the centre of the screen provides a clear view of the proceedings and a dual-mode strip running along the bottom can be used to organise clips in storyboard mode, or the more conventional timeline.

The package includes a realtime preview feature that, in theory, should leverage the power of multi-GHz processors to do all the number crunching. But even on a very fast machine, it's still a dream. First, resolution suffers, then dropped frames give your playback a bad case of the jitters, and here Video Studio is no exception. In our view, the delay involved in rendering for a decent quality preview is preferable to sub-standard so-called realtime previews and it's best turned off and ignored.

Though aimed squarely at beginners, Video Studio 7 provides some advanced features, including keyframed customisation of effects and transitions. There are also five new video filters: old film, lighting, lens flare, comic and bubble. While increased control over effects is always welcome Ulead could go a step further and provide some presets to give users some ideas on how to

make best use of them. As it stands, the options panel, through which all settings and adjustments are made, is the least intuitive and easy to use part of the interface.

Video Studio 7 offers about the best introduction to editing you'll find for less than £50 – a small premium on the price of a camcorder that will enable you to get a lot more from the hardware. It provides the basics for hassle-free capture, editing and DVD burning in one package, plus just enough freedom and control for those who want to experiment a little once they've found their feet.

### DETAILS

**PRICE** £46.99 (£39.99 ex VAT)  
**CONTACT** Ulead 01327 844 880  
[www.ulead.co.uk](http://www.ulead.co.uk)

#### SYSTEM REQUIREMENTS

800MHz Pentium III, Windows 98SE/ME/2000/XP, 500MB hard disk space for program, 4GB disk space for capture

**PROS** Good auto scene detection and mpeg capture

**CONS** Realtime preview leaves a lot to be desired

#### VERDICT

Great for beginners, but doesn't offer all that it promises

<b>EASE OF USE</b>	★★★★★
<b>DOCUMENTATION</b>	★★★★★
<b>FEATURES</b>	★★★★★
<b>OVERALL</b>	★★★★★



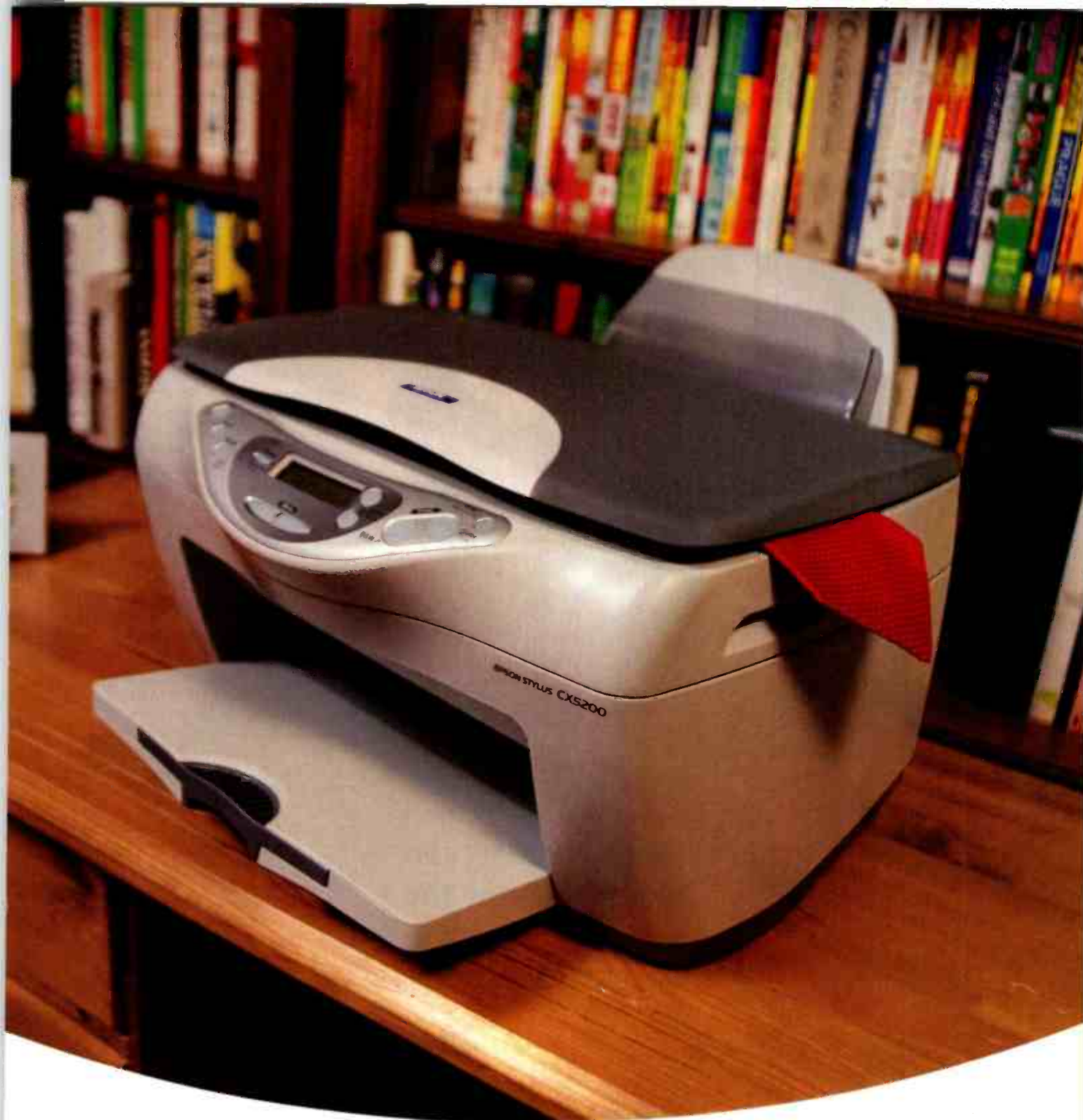
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## Table of features

					 <b>EDITOR'S CHOICE</b> PERSONAL COMPUTER WORLD
MANUFACTURER	CANON	JVC	PANASONIC	SAMSUNG	SONY
MODEL	MVX2i	GR-DVP9	NV-DS65	VP-D590i	TRV33E
Price (ex VAT)	£864 (£735.32)	£744 (£633.19)	£465.88 (£396.50)	£546.01 (£464.68)	£589 (£501.28)
Telephone	0800 616 417	0870 330 5000	0870 535 7357	020 8232 3280	08705 111 999
URL	<a href="http://www.canon.co.uk/digitalcamcorders">www.canon.co.uk/digitalcamcorders</a>	<a href="http://www.jvc.co.uk">www.jvc.co.uk</a>	<a href="http://www.panasonic.co.uk">www.panasonic.co.uk</a>	<a href="http://www.samsungelectronics.co.uk">www.samsungelectronics.co.uk</a>	<a href="http://www.sony.co.uk">www.sony.co.uk</a>
Optical/Digital zoom	10x/200x	10x/200x	10x/500x	10x/400x	10x/120x
CCD	1/4in 1,330,000 pixels	1/4in 1,330,000 pixels	1/6in CCD 800,000 pixels	800,000 pixels	1,070,000 pixels
LCD panel	2.5in TFT 200,000 pixels	2in	2.5in	2.5in 211,000 pixels	2.5in 123,200 pixels
AE modes	Auto, sports, portrait, spotlight, sand & snow, low light, night, super night	Night scope shutter 1/150, shutter 1/120, sports, snow, spotlight, twilight	Auto, sports, portrait, low light, spotlight, surf & snow	Auto, sports, portrait, spotlight, sand & snow, high speed	Spotlight, portrait, sports, beach & ski, sunset moon, landscape
Manual modes	Exposure, focus	Exposure, focus	Exposure, focus	Exposure, focus	Exposure, focus
Max still picture resolution	1,280 x 960	1,280 x 960 (1,600 x 1,200 interpolated)	640 x 480	640 x 480	1,152 x 864
Memory card video format	320 x 240 12.5fps motion jpeg	Mpeg4	N/A	N/A	320 x 240 mpeg1
Media	MiniDV cassette, SD card, Multimedia card	MiniDV cassette, SD card, Multimedia card	MiniDV cassette, SD card, Multimedia card	MiniDV cassette, Memory stick	MiniDV, Memory stick
I/O ports	DV in/out, AV in/out, S-Video in/out, USB, linc, mic	DV in/out, AV in/out, S-Video in/out, USB	DV in/out, AV out, S-Video out, USB, mic	DV in/out, AV in/out, S-Video in/out, USB, mic/headphones	DV in/out, AV in/out, S-Video in/out, USB, linc, mic
Remote control	✓	x	✓ (plus 'Freestyle' controller)	✓	✓
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Documentation	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Range of features	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★

## Table of features

				 <b>EDITOR'S CHOICE</b> PERSONAL COMPUTER WORLD
MANUFACTURER	ADOBE	MAGIX	ROXIO	ULEAD
PRODUCT	PREMIERE 6.5	VIDEO DELUXE 2 PLUS	VIDEO WAVE 5 POWER EDITION	VIDEO STUDIO 7
Price (ex VAT)	£522.88 (£445) with Matrox RT.X10: £445.32 (£379)	£59.99 (£51.05)	£69.32 (£59)	£46.99 (£39.99)
Telephone	020 8606 4001	01923 495 496	N/A	01327 844 880
URL	<a href="http://www.adobe.co.uk">www.adobe.co.uk</a>	<a href="http://www.fasttrak.co.uk">www.fasttrak.co.uk</a>	<a href="http://www.roxio.de/english/home.php3">www.roxio.de/english/home.php3</a>	<a href="http://www.ulead.co.uk">www.ulead.co.uk</a>
Storyboard editing	✓	✓	✓	✓
Timeline editing	✓	✓	x	✓
Auto scene detection	x	✓	✓	✓
Customisable workspace	✓	✓	x	x
Titling editor	✓	✓	✓	✓
Audio mixing and effects	✓	✓	✓	x
Keyframeable effects	✓	x	x	✓
Colour adjustment	✓	✓	✓	✓
DVD authoring/burning	Sonic Solutions DVDIt LE	✓	✓	✓
Ease of use	★★★★★	★★★★★	★★★★★	★★★★★
Documentation	★★★★★	★★★★★	★★★★★	★★★★★
Range of features	★★★★★	★★★★★	★★★★★	★★★★★
Overall	★★★★★	★★★★★	★★★★★	★★★★★



## Printer, Copier, Scanner, Tie Press.

Introducing the **EPSON** Stylus CX5200, the most versatile tie press on the market. Additional features include printing, copying and scanning. This space saving, three-in-one package doesn't compromise on quality. Using **EPSON** DURABrite inks that produce 5760 optimised dpi with RPM you can achieve true photo-quality output. What's more, your prints are waterproof, smudge resistant and fade resistant for up to 70\* years - even on plain paper.

There's colour copying without having to use your PC, 1200 dpi scanning and an impressive speed-printing rate of up to 22ppm. In fact, it does everything you'd expect from separate machines - but all from a single cable-clutter-free unit for around £199. Perfect for anyone with limited space or wrinkled ties. If you'd like to know more about the **EPSON** Stylus CX5200 call **0800 220 546** or visit [www.epson.co.uk](http://www.epson.co.uk)

\*EPSON test conditions apply

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# Editor's Choice

**D**ifferent people want different things from a camcorder, but in this group test we've focused on devices that provide something for everyone.

For the beginner – and those who aren't interested in the how and the why – point-and-shoot and ease of use is something all these cameras excel at. You can pick them up, point them at the subject, press record and generally get excellent results.

Beyond that, all of them also offer a range of auto exposure (AE) programs that optimise settings for particular circumstances – on the beach, shooting fast moving subjects, portraits and so on.

For the truly adventurous, manual exposure and focusing provide the opportunity to take total control of how your video looks and, again, all the models reviewed provide these features.

But to be of real use these features must be familiar and accessible. If the auto exposure mode is having trouble with a subject, you need to be able to switch to manual and use it in the blink of an eye. If the surf and snow mode is nested three menus down, most people are unlikely to know about it, let alone use it.

## The winners

The **Sony TRV33E** gets our **Editor's Choice** award, primarily because of its success in providing accessible advanced features through the use of a touch screen LCD panel.

The touch screen panel is by far the simplest way to access camcorder functions. Everything from VCR control to exposure modes and still picture resolution can be set quickly and intuitively in a consistent fashion, and we wouldn't mind betting we start to see touch screen panels making an appearance on more models in the future.

In terms of all-round features the TRV33E outclassed the other models on test. We wouldn't recommend you consider any camcorder without bi-directional DV (Firewire), AV (composite), and S-Video analogue ports – the TRV33 offers all those plus USB, Linc and an external mic socket.

Its Super Steady Shot image stabiliser was among the best, providing good results both for static and panning shots. While its 1,152 × 864 still picture resolution is beaten by both the Canon and JVC models here, it's good enough to act as a back-up camera when you want to travel light. The TRV33E won't replace a dedicated stills camera, but even Sony's 2megapixel DCR-IP220E can't match current 3megapixel budget cameras.



Sony TRV33E

**'The touch screen panel is by far the simplest way to access functions'**



Ulead Video Studio 7

Finally, there's the price. We would have expected a new Sony model with this kind of specification to be closer to the £1,000 mark, but it's currently being advertised for around half that (ex VAT). Usually you'd have to wait a few months for the price of a new Sony model to drop to within the affordable range, but at this price there's no need to wait.

And so to the software. With one exception, our main criteria for assessing the video editing packages was ease of use. We've included Adobe Premiere 6.5 in this round-up to show what's available at the professional end of the video editing market. There are other professional packages, such as Ulead's Media Studio Pro 7, Pinnacle Edition 5 and Sonic Foundry Vegas 4 (reviewed page 85), but in our view Premiere, in combination with the Matrox RT.X10 realtime card, provides the most versatile, best value high-end video editing solution.

From the remaining packages, **Ulead Video Studio 7** gets the **Editor's Choice** award for providing the most easy-to-use and comprehensive suite of editing tools. Like most good software, Video Studio breaks down the task into simple processes, but doesn't restrict you to a rigid format. Capture tools are as good as, and in some cases better than, those in packages costing a lot more, and auto scene detection means the tedious job of dividing the contents of your tape into manageable clips is all done for you. What's more, if you're planning on producing a DVD, the clips can be automatically transcoded into mpeg2 format at capture time, saving you the time and effort at the DVD authoring stage.

Although the workspace can't be customised, Video Studio 7 provides a massive preview window and, where they're available, customisation controls are intuitive. Video Studio 7 has extended the range of effects and transitions to include keyframeable controls, and in future releases we'd hope to see these become both more powerful and easier to use.

Video Studio 7 provides the best DVD authoring features of any of the products on test, integration with the video editing application makes it far less labour intensive than starting from scratch with a dedicated DVD authoring application, and a new DVD authoring wizard makes this easier than ever.

For the future, Magix Video Deluxe 2 is definitely one to keep an eye on. The current version offers a powerful mix of editing, cleaning and special effects tools combined with DVD authoring that offers a high level of features and encoding control.

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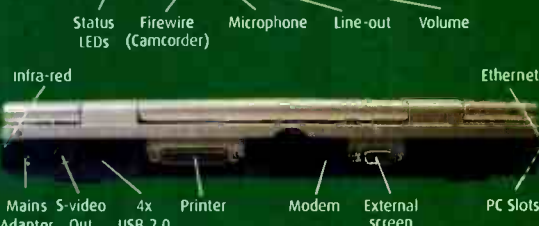
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# Ultima Notebook



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(COMBO)

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- Li-ion Long life 9 cell battery and A/C adaptor/charger
- Built-in microphone and twin stereo speakers

- plus ports for external speakers, microphone and analogue/digital Line Out devices
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- Power DVD video software & CD 'burn' software
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- 3.4Kg 310 x 265 x 40mm

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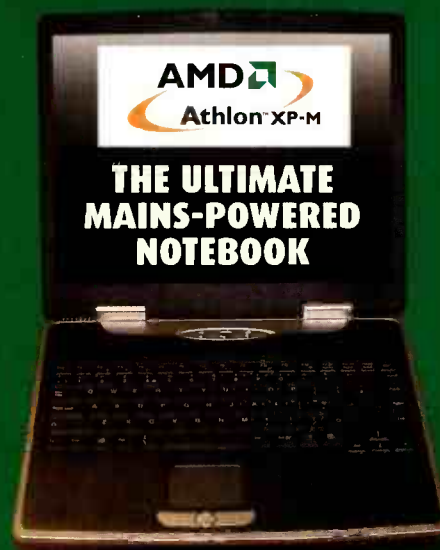
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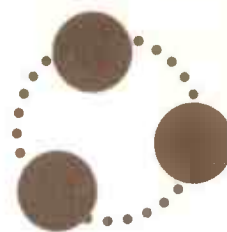
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# Network



WRITTEN BY ALAN STEVENS

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## Wireless security

Security concerns related to wireless networking are at last being addressed, with one of the most important developments, Wifi Protected Access (WPA), announced by the Wifi Alliance at the end of 2002.

WPA implements the Temporal Key Integrity Protocol (TKIP), itself part of the larger IEEE 802.11i security standard expected to be ratified at the end of the year. This ensures encryption keys vary for each packet, increases the key space and introduces an integrity check to prevent attackers modifying packets as they are communicated. Support for Radius authentication on corporate networks has also been added, and WPA also stops authenticated users joining rogue networks which might steal their credentials.

There's wide industry support for WPA with Microsoft offering a free Windows XP download to support the new standard. However, you'll need more than just this patch, as wireless adapters and access points also need to be upgraded, and you'll need to update client drivers too.

According to the Wifi Alliance, WPA certification should have been well under way by the first quarter of 2003, but when we checked in April we only found promises of support. Updates for existing hardware are taking longer to develop and certify than anticipated. Check vendor websites until patches are released.

This month, we focus on Microsoft's Windows Server 2003, and check out A3 printing, a back-up drive and more

## Go faster Ethernet

Intel has made two significant networking announcements. The first is the introduction of new Gigabit Ethernet products based on CSA, its Communications Streaming Architecture, which could potentially double throughput to the desktop. The second is the release of the world's first 10-Gigabit Ethernet (10GbE) server adapter.

CSA is a dedicated bus technology able to talk directly with the memory controller on the yet to be released Intel Springdale and Canterwood motherboard chipsets. When these are implemented it will support a bidirectional bandwidth of 2Gigabits/sec, twice that of the 32bit PCI bus, potentially enhancing the performance of a range of networking-related applications.

The first product to use CSA is the Intel PRO/1000 CT Desktop Nic which Intel hopes will help accelerate the deployment of Gigabit Ethernet – a technology that has yet to gather pace. One consequence of this will be increased pressure on server bandwidth, so the company has also announced a four-port GbE server card – the Intel Pro/1000 MT. It's also the first networking vendor to market a 10GbE server adapter – the Intel PRO/10GbE LR – supporting 10GbE over distances up to 10km using single-mode optical fibre.

Previously only used to connect backbone switches, Intel believes that 10GbE is needed to accommodate bandwidth-intensive applications, such as imaging and data mirroring.



It doesn't look much, but the new Intel PRO/1000 CT could potentially double throughput to Gigabit Ethernet desktops

However, the current economic climate may inhibit the adoption of the technology, which is far from cheap. The new adapter is around £4,800 ex VAT, and the host network also needs to be upgraded with equally expensive 10GbE switches.

Still it's good to know the technology is there for those that want it and, as with all new developments, prices are bound to fall sooner or later.

## On Technology into Icommand

On Technology ([www.ontechology.info](http://www.ontechology.info)) is best known for On Command CCM, a popular remote system provisioning and management platform. However, of late this has lost some of its appeal due to a lack of support for much beyond Windows, and poor performance over low

bandwidth connections – both issues that the company is hoping to address with a new product called On Icommand.

According to IT analysts Gartner, Linux is now in use in over 80 per cent of large companies, and there's demand too for management tools able to work with mobile devices. On Icommand addresses these

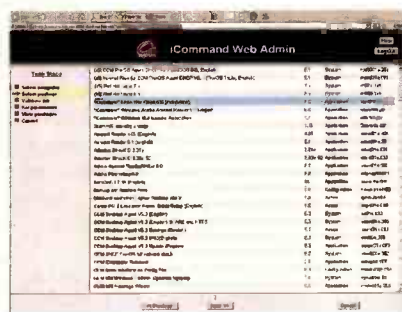
needs with a new Java agent that can be implemented on systems running a variety of Linux distributions, together with Sun Solaris, HP-UX, Apple Macintoshes and PocketPC-based PDAs.

On Icommand is now far more versatile

Improved byte and file level differencing help conserve bandwidth on slow links, and there are also new dynamic throttling facilities and the ability to re-start interrupted transfers. Compression and encryption are also enhanced, with transfers done using HTTP to provide simpler remote system management across firewalls.

Web based administration has also been added, along with a self-service web portal, to enable end users to manage their own systems. The software has the same kind of open API as On Command CCM, so it can be integrated with other tools.

Released at the beginning of April, prices weren't available when we went to press, but look out for a review in PCW shortly.





## A3 PRINTER

# Kyocera-Mita FS-6020N

Low cost A3 printing with a good level of specifications



The Ecosys FS-6020N from Kyocera-Mita has one of the smallest footprints in the industry for an A3 laser, and the lowest running costs

**G**iven that it can print at speeds of up to 20 pages per minute (ppm) and handle A3 documents, the network-ready Ecosys FS-6020N from Kyocera-Mita is a good value workgroup laser. However, the cost benefits don't end with the sub-£1,000 ex VAT price tag, as the FS-6020N has long-life optical components guaranteed for 200,000 pages or three years, leaving the toner as the only consumable you will normally need to buy.

This toner-only approach makes Kyocera-Mita printers cheaper to run than the competition, since other makes include expensive new optical components in every toner cartridge used. The company claims to have the lowest running costs in the industry, and has backed this up with a money back guarantee if you don't see savings on consumables compared to a similar printer from another vendor. Few buyers are likely to need to claim on the guarantee with the FS-6020N.

With a recommended price of £56 ex VAT, the toner cartridges are good for around 10,000 A4

pages (at five per cent coverage), equating to just over 0.5p per page. Of course, you have to factor in the cost of paper and the purchase price of the printer to come up with a proper cost per page, but that's true with other printers too.

Add in the fact that Kyocera-Mita slashed printer prices at the start of the year and there's really no arguing with the potential cost savings. On top of which, it's also a very well specified and easily expanded device. For instance, there's the remarkably compact 1,200dpi laser engine which boasts a duty cycle of 65,000 pages per month, capable of printing A3 pages at 11ppm and A4 at 20ppm. A single board controller with a 200MHz PowerPC processor provides the motive force behind this, enabling the first page of most documents to be printed in less than 12 seconds.

PCL6 and Postscript Level 3 emulations are also included as standard, with 80 PCL and 136 Postscript outline fonts built in. There's 32MB of memory, which can be expanded to 144MB, using industry standard Dimms.

Another plus is the ability to expand the paper handling facilities on the FS-6020N, simply by stacking extra trays underneath. As standard, the printer comes with a fold-out 100-sheet multi-purpose tray to take card, transparencies and other awkward materials, plus a 250-sheet drawer for ordinary paper. Up to four additional A4/A3 drawer units can be added, at a cost of £182 ex VAT each. These expand the capacity of the Kyocera-Mita printer to 1,350 sheets altogether, fed from six sources, making it easy to handle things like letterheads and paper types. There's also an optional duplexer (£365 ex VAT) for double-side printing and a hard disk (£369 ex VAT) for storing extra fonts and forms. On the downside, there are no document sorting or finishing attachments, just the one 250-sheet output bin at the top of the printer. That is a shame, as one of the advantages of an A3 printer is the ability to create folded A4 booklets, where a finisher/stapler would be a useful add-on.

On the networking front, a 10/100Mbps/sec Ethernet

interface accompanies the USB port; this multi-protocol controller also provides print server emulation with support for a range of networking environments including Apple Mac, Linux and proprietary Unix systems as well as the expected Windows and Netware networks. Fibre optic and wireless interfaces can also be specified and, as with other Kyocera-Mita printers, you get a copy of its KM Net management suite, which can be used to monitor and manage printers from a variety of manufacturers.

Print quality is excellent and the FS-6020N is very easy to use. It also boasts several useful job control features, such as the ability to require a Pin number before printing confidential documents, plus on-demand printing of stored jobs and a proof-and-hold option to check for errors before printing large multi-copy jobs. One year's on-site warranty comes as standard.

The FS-6020N offers fast and remarkably affordable A3 printing without compromising on quality or functionality. It's just a shame there aren't any finishing options to go with it.

### DETAILS

**PRICE** £1,150.33 (£979 ex VAT)

**CONTACT** Kyocera-Mita

0118 9311500

[www.kyoceramita.co.uk](http://www.kyoceramita.co.uk)

#### SPECIFICATIONS

20ppm A4; 11ppm A3; 32MB memory; 65,000 page per month duty cycle; 100-sheet multi-purpose tray and 250-sheet paper drawer; PCL6 and Postscript Level 3 emulation; 10/100 Ethernet; support for Mac, Linux/Unix, Novell Netware and Windows networks

**PROS** Output; size; low running costs; money back guarantee

**CONS** No document sorting/finishing options

#### VERDICT

Cheap to run, with good specification and paper handling. Fast and affordable, the only issue is the lack of finishing options

**SCORE**

★★★★★

**WIRELESS LAN USB STICK****Benq AWL400**

Swivelling wireless USB adapter



**O**n most notebooks, wireless networking is easy – pop in a suitable PC Card and go. However, if you've used up your PC Card slots, or want wireless on a desktop PC, a USB adapter like the AWL400 Wireless USB Stick from Benq is a simple alternative.

Little bigger than a USB memory stick, the AWL400 is a Wifi certified 802.11b adapter that can be plugged into any available USB socket (1.1 or later). A blue LED shows it's powered up, while a hinge above the connector allows the main body to be positioned. Alternatively, the USB extension cable supplied allows it to be located remotely.

Windows driver software comes on CD-Rom and auto-installs as soon as the disk is inserted, but you need to do this before plugging in the adapter for the first time. With Windows XP, the built-in operating system software is used to manage the wireless setup, while on other versions, a custom site survey utility and taskbar icon are installed. Either way, you can scan for and connect to any available 802.11b wireless Lan and specify the level of WEP (Wired Equivalent Privacy) encryption and pass phrases. There's also an ad-hoc mode, to enable the

adapter to communicate directly with other PCs without the need for an access point.

It took about five minutes to install the adapter and connect to the wireless networks, using access points from a number of manufacturers. Signal strength was on a par with PC Card and PCI adapters in the same location. Benq claims a maximum indoor range of 100m, but interference and obstructions will reduce this. Still, we had no problems.

The only issues are the lack of support for anything other than Windows. Also, because it's external, it is more likely to be mislaid than an internal adapter.

**DETAILS**

**PRICE** £64.99 (£55.31 ex VAT)

**CONTACT** Benq UK  
01442 301000 [www.benq.co.uk](http://www.benq.co.uk)

**SPECIFICATIONS**

Wifi certified 802.11b wireless adapter; USB1.1 interface; 64/128bit WEP encryption; Ad-hoc (peer-to-peer) and infrastructure (access point) operation; Windows drivers

**PROS** Tiny and very portable; hinge design for best positioning; Wifi certified

**CONS** Windows drivers only; easy to mislay or steal

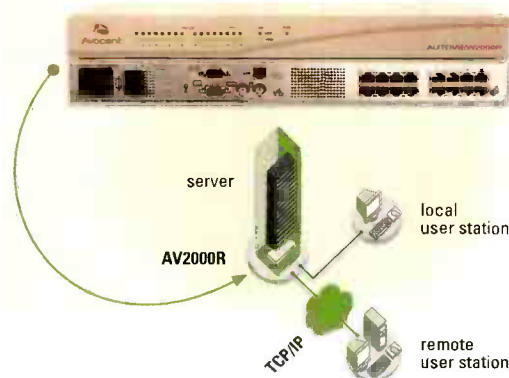
**VERDICT**

A neat and easy way to wireless networking via USB

**SCORE****TAKE CONTROL!**

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# PC

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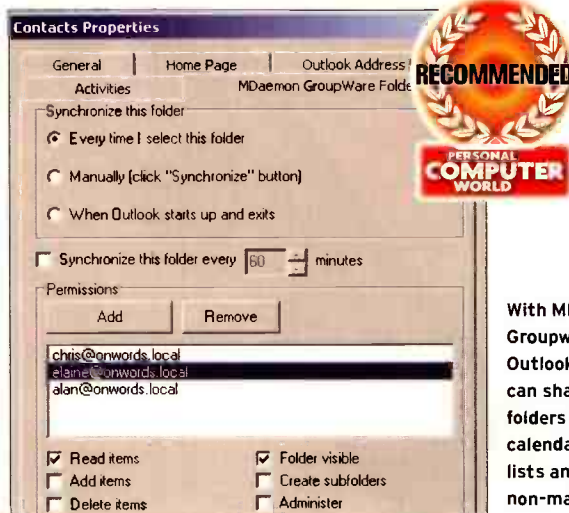
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## OUTLOOK SHARING SOFTWARE

# MDaemon Groupware

Share contacts in Outlook without exchange



With MDaemon Groupware, Outlook users can share folders containing calendars, contact lists and other non-mail items

One of the benefits of Outlook is the ability to share calendars, contact lists and tasks, although this is normally only possible when it's used with Exchange Server. Mdaemon Groupware removes this restriction, making it possible for small businesses to share Outlook folders more cheaply, without the overheads associated with the Microsoft mail server.

An SMTP (Simple Mail Transfer Protocol) server is still needed in the form of Mdaemon Pro, a Windows mail server which supports POP3 (Post Office Protocol) message retrieval and Imap (Internet Message Access Protocol); the main difference is that Imap folders and messages are stored on the server rather than copied to the client system. The Groupware add-on exploits this by automatically synchronising nominated local folders with shared Imap copies on the server.

The necessary software can all be downloaded from the supplier's website and trialled for 30 days free of charge. You then have to install and configure an Outlook plug-in, after which users can choose the folders they want to share using a new Groupware tab added to the folder properties. From here it's possible to specify the users

allowed access to each folder and the level of access allowed.

We had no problems installing the mail server or Outlook plug-in, and were impressed with how easy it was from a user viewpoint. Some expertise is required to set everything up, but it's easier than configuring Exchange, and the documentation is well written.

As always there are also cost savings to consider. You need to buy Mdaemon Pro as well as the Groupware licence, but the complete solution starts at less than £280 ex VAT, which is roughly a third of a comparable Exchange setup.

### DETAILS

**PRICE** From £91.65 (£78 ex VAT) for six users  
**CONTACT** Zen Software  
0870 609 0410

[www.zensoftware.co.uk](http://www.zensoftware.co.uk)

### SYSTEM REQUIREMENTS

Pentium II (or faster); 256MB Ram (512MB recommended); 30MB disk space; Windows 95/98/ME/XP/NT/2000; TCP/IP networking;

MDaemon Pro v6.7 or later installed

**PROS** Allows Outlook folders to be shared without Exchange Server; low price; easy to use

**CONS** Only shares non-mail; use with the Mdaemon Pro mail server

### VERDICT

A cheap and easy alternative to Exchange that will be of interest to small companies

**SCORE** ★★★★★

**TAPE DRIVE**

# Tandberg Data DLT VS160

## New backup tape drive for mid-range enterprise servers



**Faster than cheaper entry-level tape drives, and with a lot more capacity, the Tandberg VS160 fills the gap between those products and more expensive high-end tape drives**

**B**ased on Quantum's DLT (Digital Linear Tape) technology, the new DLT VS160 tape drive, manufactured and sold by Tandberg in Europe, is clearly designed with mid-range enterprise servers in mind. It can store up to 80GB of data on a single cartridge (160GB with compression applied), which is half the capacity of high-end SuperDLT drives, but still enough to back up the average small company or departmental server using just one tape. It also boasts a sustained transfer rate of up to 8Mbytes/sec (16Mbytes/sec compressed) – fast enough, in theory at least, to complete that backup in a couple of hours.

However, as with all capacity and performance claims, these figures won't always be achieved in practice. Moreover, although billed as a value product, the DLT VS160 isn't a cheap solution and isn't necessarily the best product for everyone looking to back up a mid-range server.

Let's start with price. The self-contained external model we looked at sells at just under £2,000 ex VAT, with the bare internal drive slightly cheaper

at around £1,635 ex VAT. That's still roughly what you'd pay for a basic departmental file server these days; the addition of the tape drive effectively doubling the cost, unless it's shared between several systems. Media costs also need to be considered, with the DLT tape VS1 cartridges required to get the maximum capacity on the VS160 retailing for around £75 ex VAT.

Bear in mind that backup software isn't included in the price although, as it's based on DLT technology, the VS160 will work with just about any backup program you care to name. And, of course, there's compatibility with earlier DLT formats, which is important if you have other DLT1/VS80 drives in the office.

Whether or not you see this as good value will depend on the amount of data that needs to be copied and the time available to take backups. Where backups can be taken overnight, for example, speed may only be an issue when restoring data, plus incremental backups can help overcome capacity and speed limitations. The type of server involved and

its SCSI interface will also have a bearing as, although it can be attached to any server with a single-ended or low-voltage differential (LVD) SCSI bus, the VS160 will only achieve its maximum transfer rate with a fast host processor and Ultra160/320 SCSI interface. And don't expect the hardware compression to live up to the claims made, either. As with all tape drives, a 2:1 compression ratio may be possible in theory, but with real data such figures are rarely achieved, resulting in lengthier backups than you might otherwise expect.

To get a feel for what the VS160 is capable of we tested it on two server configurations. The best results were obtained using a recent Xeon-based system with an Ultra160 SCSI controller. On this server the Tandberg drive turned in rates in excess of 8Mbytes/sec, the actual figure depending on the compressibility of the data involved. On an older Pentium III server fitted with an Ultra2 SCSI interface, however, backups took longer. Here the transfer rate fell to around 6Mbytes/sec. That's well down

on the claims made, but not bad given the limitations of the platform used. Indeed, it's a lot quicker than cheaper alternatives such as DDS (currently limited in capacity to just 20GB uncompressed data per tape), Sony AIT-1 (35GB) and the 40GB DLT1/VS80 products. These are around half the price, but nowhere near as quick and unable to compete on capacity.

The Quantum/Tandberg pedigree is another point in favour of this drive, with DLT a tried and trusted format for reliable long-term data storage. As such, if you need the capacity of the Tandberg DLT VS160 and understand how to get the best from it, this drive can be considered a good buy. Moreover, it neatly fills the gap that previously existed between entry-level products, typically selling at half the price, and enterprise tape drives, such as the SDLT320, which can cost up to half as much again. Look out, too, for automated libraries based on the VS160. These are expected shortly and will further enhance the appeal of this mid-range tape drive, making it suitable for a far wider range of backup applications.

**DETAILS**

**PRICE** £2,346.48 (£1,997 ex VAT)

**CONTACT** Tandberg Data  
0800 1691 661 [www.tandberg.com](http://www.tandberg.com)

**SPECIFICATIONS**

External 0.5in Digital Linear Tape (DLT) drive; 80GB per cartridge (160GB compressed); 8Mbytes/sec sustained transfer rate (16Mbytes/sec compressed); read-only compatibility with DLT1/VS80 cartridges; wide ultra SCSI interface

**PROS** Quantum DLT technology; high capacity and transfer rate; reads earlier DLT formats

**CONS** Expensive; software not included; requires well-specified server for maximum throughput

**VERDICT**

Plugs the gap between entry-level tape drives and enterprise products, but not a cheap solution

**SCORE**

★★★★★



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WORDS: ALAN STEVENS

# Built to serve

Will Microsoft's latest server operating system have sufficient performance enhancements and flexibility to tempt non-believers to the Windows platform?

**O** riginally known as Whistler, then for a while as Windows .Net Server, the latest incarnation of Windows for servers is now called simply Windows Server 2003. It's an OS with a lot of pre-launch hype, but as of 24 April the new operating system has finally started shipping, with Microsoft hoping it will appeal to a broad range of businesses from SMEs to large enterprises.

In its favour, the new software is based on the Windows 2000 code, which should make this a stable release. Moreover, as with XP, the beta-testing program involved thousands of companies worldwide, so most of the bugs should have been dealt with by now. The launch was also delayed by more than a year to get the security right, so hopefully there shouldn't be as many vulnerabilities for hackers to find as with previous releases.

Microsoft has also enhanced the performance, scalability and management of the software with the aim

of tempting companies running Unix, Linux and other operating systems to switch to the Windows platform. In particular, it has addressed many of the issues surrounding Active Directory, which have dogged the technology since its introduction in Windows 2000. And, of course, it has built-in services to support the much vaunted .Net Web services initiative. However, the company no longer stresses this functionality, hence the dropping of .Net from the name, most probably because it led customers to think that .Net was all that the software was about.

And that's a long way from the truth. Windows Server 2003 is a comprehensive re-write of the Microsoft server operating system with benefits to be had whether you're hosting applications or sharing files. There's far too much to cover in one review, so we've dedicated several pages this month to describing the key features, checking out the performance claims and providing an independent assessment of what Windows Server 2003 has to offer.







## Products and prices

A total of five versions of Windows Server 2003 are planned, including a small business product, which will include bundled applications such as Exchange and SQL Server. However, that version won't be available until later in the year. In the meantime, the four packages launched in April start with Windows Server 2003 Standard Edition aimed, primarily, at the small-to-medium and departmental server markets. This version offers out-of-the-box support for up to four 32bit processors and 4GB of memory, and is a full implementation of Windows Server, including Terminal Services and the latest IIS 6 web software, although without clustering support and a few other high-end features.

To get clustering you need the Enterprise Edition. The name here clearly reflects the intended market. This version is a lot more scalable than the Standard Edition with support for eight-way multi-processing as standard, and a 64bit implementation for use on Itanium servers, if required. And it's worth noting that the 64bit software is based on the current 64bit Windows Advanced Server Limited Edition (LE) kernel, support for which is set to be discontinued 90 days after the Windows 2003 launch.

Memory support is also enhanced in this Edition, with up to 32GB of memory addressable by Enterprise servers equipped with 32bit processors and 64GB with Itanium. You also get a number of extra features in the Enterprise Edition, including support for Numa (non-uniform memory access) platforms, remote storage, San boot facilities and the Windows Resource Manager (WRM), which allows CPU, memory and other resources to be allocated to specific applications.

Higher up the scale still comes the Datacenter Edition, which, like the Datacenter version of Windows 2000, is only available from selected hardware vendors such as HP, Dell and Unisys. This version is also available for 64bit as well as 32bit platforms and can scale to 32-way SMP with a 64GB address space on 32bit platforms and 512GB when used with Itanium. However, the Datacenter version provides no extra functionality beyond that included in the Enterprise Edition, and the Datacenter software needs a minimum of eight processors to start with. Microsoft



Windows Server 2003 will run on a variety of servers including small business platforms like the Express5800 TM1400 from NEC. The machine was our Editor's Choice in last month's small business server group test

sees Datacenter as its main vehicle for companies looking to consolidate server hardware.

At the other end of the spectrum there's a low-cost version of the Microsoft server software aimed expressly at companies looking to develop and host web-based applications. Called, not surprisingly, the Web Edition, this version is optimised for serving web pages using IIS 6 and is a 32bit implementation that can be deployed on servers with up to two processors and 2GB of memory. However, small companies looking to save money by installing the Web rather than Standard Edition could be disappointed, as the functionality beyond web serving is limited.

With the exception of the new Web Edition, prices are pretty much on a par with those for Windows 2000 Server, which will continue to be sold and supported for several years yet. For example, at the time of the April launch we found online resellers advertising the Standard Edition at £680 ex VAT with five-client access licences (Cals) and £815 for the 10 Cal package. That compares with around £700 and £845 (both ex VAT) for Windows 2000 products from the same sources. Similarly, the Enterprise Edition – the equivalent of Windows 2000 Advanced Server – was being advertised for £2,649 ex VAT, with 25 Cals included, roughly the same as for Windows 2000.

Prices for the Datacenter Edition aren't readily available since the software is only available as a package with new server hardware. But the Web Edition will be a widely available retail solution with a price of just £275 ex VAT. That's to allow it to compete with Linux server solutions from Red Hat, Suse and others, although that may not happen quite as Microsoft expects (see Linux alternatives box-out for more details).

Finally, the cost of upgrading to Windows Server 2003 will depend on the licensing deal you have with Microsoft. Large corporates with upgrade protection, for example, will be able to upgrade free of charge. Others will need to buy upgrades, with prices expected to be on a par with current Windows 2000 offerings.

## Getting started

The requirements for Windows Server 2003 aren't that much more onerous than for Windows 2000, which is good news for companies looking to upgrade, as there's no absolute need to replace hardware. For instance, all versions other than the Datacenter Edition can be supported using a 133MHz Pentium processor – although something faster is certainly preferable – while memory and other requirements vary depending on the version involved (see table below).

## Windows Server 2003 hardware requirements

Edition	DATACENTER	ENTERPRISE	STANDARD	WEB
Minimum CPU	400MHz Pentium or 733MHz Itanium	133MHz Pentium or 733MHz Itanium	133MHz Pentium	133MHz Pentium
SMP support	32-way (minimum of eight processors required)	Eight-way	Four-way	Four-way
Minimum Ram	512MB	128MB	128MB	128MB
Recommended Ram	1GB	256MB	256MB	256MB
Maximum Ram	64GB (x86) 512GB (Itanium)	32GB (x86) 64GB (Itanium)	4GB	2GB
Disk space required	1.5GB or 2GB for Itanium	1.5GB or 2GB for Itanium	1.5GB	1.5GB
Clustering	Eight-way	Eight-way	N/A	N/A

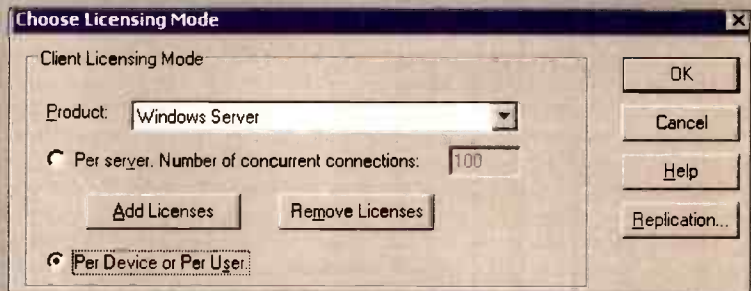
## Linux alternatives

Microsoft is hoping to diminish the growing share of the server market being taken by Linux, with its new low-cost Web Edition of Windows Server 2003. However, it may not have gone far enough to achieve this in either the small business or larger enterprise markets.

On the face of it the Web Edition, at around £323 (£275 ex VAT) should appeal to small companies which might otherwise consider Linux. But that's not quite the case, as the Web Edition is very much about web hosting with limited functionality in other areas. For instance, it can't be configured as a domain controller and will only support up to 10 file-sharing connections.

Compare that with the latest Red Hat Linux 9 product, selling for around £129 (£110 ex VAT), which not only includes the popular Apache Web server, but has no file-sharing limits and, using Samba, can even emulate a Windows domain controller. There is the small matter of the different technical skills needed to install and manage a Linux server, a factor which traditionally works in the favour of Windows. But with the latest graphical interfaces, Linux isn't that difficult to get to

With Windows Server 2003, Microsoft is clearly targeting Linux server packages like those from Red Hat



In Windows Server 2003 client connections can be licensed on a per-user as well as a per-device basis. However, the need for client licences makes Windows an expensive operating system to implement compared to Linux

grips with and can be pre-installed by server vendors, which are increasingly selling it as an alternative server platform for small business buyers.

Microsoft is also facing challenges from Linux higher up the scale too, with Red Hat, Suse and other vendors releasing Enterprise-level server products which can do just as much as Windows Server 2003 for a lot less. As a spoiler to the April launch, for example, Red Hat introduced its new Enterprise Linux ES package for mid-tier servers. Priced at £764 (£650 ex VAT), the ES package is a complete departmental solution for both file and print and application-hosting networks. Moreover, as with all versions of Linux there are no extra costs in terms of client licences.

Windows Server 2003, in contrast, requires client licences even for basic file-sharing duties. Admittedly, the new release does now let you licence connections on a per-user as well as per-device basis, but the cost of client access licences (Cals) is still a major consideration.

Installation, too, is very similar to that for Windows 2000, with a bootable CD-Rom that runs through a basic blue screen setup routine to format the system disk and load the core software before handing over to a wizard-led graphical install routine. There is one big change, however, as you need to activate the software within 30 days – just as with Windows XP – otherwise it stops working.

Large customers with the necessary support agreements won't have to do this, but the procedure is very quick and painless. Moreover, we encountered very few problems installing the package on older Pentium II and Pentium III-based servers in the PCW Labs, virtually all of which then ran faster in our tests than when configured with Windows 2000 (see page 171 for a summary of the performance results). Indeed, the very few issues we did encounter were related to new network and storage controllers in more modern servers (mainly Raid controllers), the drivers for which hadn't been expressly certified to work with the new platform. Still, that's a common enough issue with any new operating system and one that will hopefully be resolved quickly. Moreover, the set-up wizard can now check for updated driver files on the web, an option that can also be scripted for unattended installation.

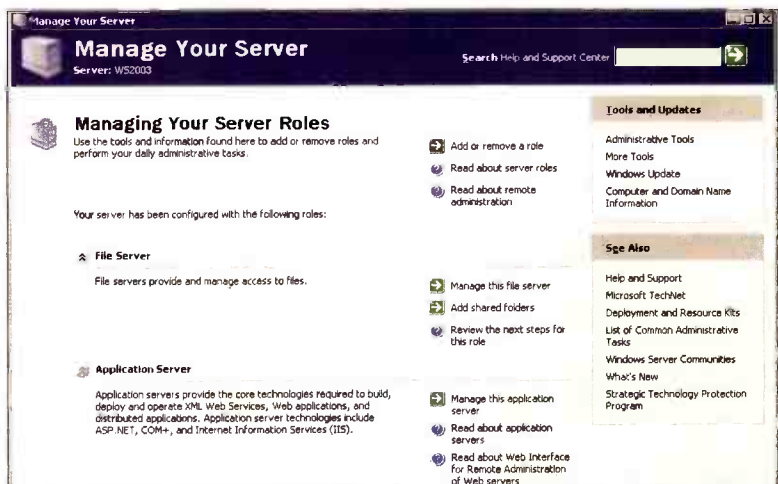
Installation takes around 30-40 minutes to get to the login stage, but it's important to understand that very few of the services you might need will have been installed or configured at this stage. That's in stark contrast to previous Windows NT and 2000 implementations where everything you might possibly want was installed by default. The old solution made life a lot easier, but posed a potential security risk as even though you might not be using a particular component, flaws in its code could still

To avoid security issues related to unwanted components, the new Manage Your Server wizard is used to configure required services based on the roles of the server

be exploited by would-be hackers and virus writers.

With Windows Server 2003 you have to expressly configure optional components and services using the new Manage Your Server wizard. This replaces the Windows 2000 Configure Your Server wizard and, similarly, runs as soon as the Administrator logs onto the newly installed system.

To make this easier the wizard talks about server roles, lists the roles already assigned to the system and steps you through the various options when assigning a new role. For example, you can choose to assign file and print server roles separately, setup the server as a domain controller and configure it to run the new SMTP/POP3 mail server, though this is not included with the operating system. Similarly, you can configure the integrated terminal





## The Netware alternative

It may have lost out to Microsoft in recent years, but Novell hasn't gone away completely, continuing to pit Netware against Windows as an enterprise server platform. Moreover, with Netware 6.5 (expected to ship in the second half of 2003) the company is hoping to continue challenging not just Microsoft but also the Unix and Linux vendors.

Support for web services is a key feature of Netware 6.5 (codenamed Nakoma), built around Extend, the Java 2 Enterprise Edition (J2EE) application server that Novell acquired when it bought developer Silverstream last year. Already available as a Novell product, the Extend server has been integrated into the core platform for the 6.5 release, along with a new web portal, XML-based directory integration and enhanced support for Open Source applications like the Apache web server, Tomcat servlet engine and MySQL database.

Another key feature is a new virtual office interface, building on the functionality provided by the Ifolder and Iprint web services in the current Netware 6 platform. This will allow users to build a complete virtual desktop in a browser to access, edit and print documents and work in virtual teams, just as with Microsoft's Sharepoint Team Services.

Clustering is also enhanced in Netware 6.5 with a licence for up to 32 nodes as standard and support for iSCSI, which does away with the need for expensive fibre channel shared storage. With new server consolidation and snapshot backup utilities included as standard, Novell is hoping this will encourage companies to consolidate systems using the Netware platform.

The management interface, too, comes in for a lot of attention in Netware 6.5, with enhanced server diagnostics, auditing and reporting features. However, despite this, the Novell software is unlikely to appeal to the smaller organisation where the familiar desktop interface in Windows Server is a key selling point. Indeed Netware has long since slipped to third place behind the much cheaper Linux offerings in this market.

Novell does, though, have a loyal following among larger enterprises, where it retains around 10 per cent market share according to most analysts. It's here that Netware 6.5 is most likely to succeed, with many existing customers already beta testing the software and expected to upgrade when it becomes available. The out-of-the-box web, directory and other services may well encourage others to add it as a single-purpose solution on existing Windows and Unix networks, as well.

With its integrated Extend J2EE application server, Netware 6.5 will build on existing web services in the Novell operating system, such as Ifolder, to provide a complete virtual office interface via a browser

services using this wizard and, if required, delete all the services associated with a role that's no longer needed. To make life even easier there's also a typical configuration option that adds the most commonly required roles for a new server. This installs Active Directory and makes the server a domain controller, configures optional DHCP/DNS services and activates the new built-in firewall.

It does take a little getting used to compared to the Windows NT/2000 way of working, but it's not particularly difficult. Added to which, the Manage Your Server wizard provides a convenient launch pad for the various tools needed to further configure and manage the services once they're installed.

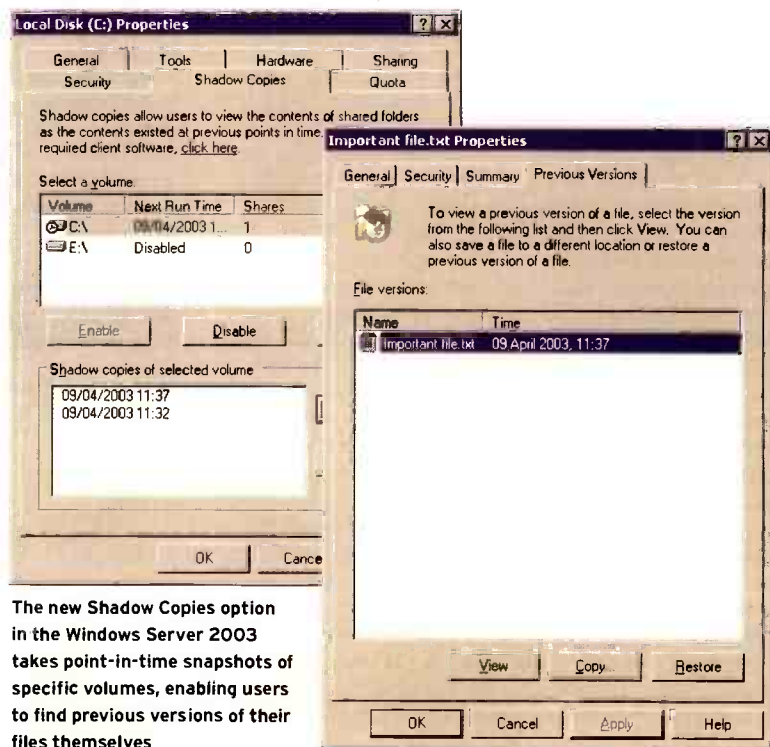
## File and print enhancements

File and print serving are still key roles for any network server, and Microsoft has done a lot to enhance these facilities in the new operating system. Storage Area Networks, for instance, are seen as very important, so there's a new San boot feature and a Virtual Disk Service (VDS) that provides a common interface for managing block storage virtualisation, effectively making it easier for San and other hardware vendors to integrate their devices into Windows.

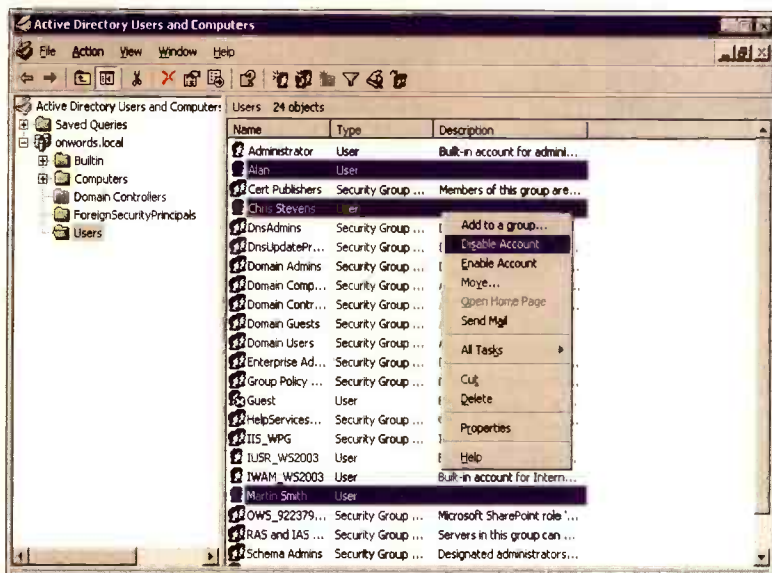
The Distributed File System (DFS) – which allows a single logical file system to be created across multiple servers – has also been enhanced to make it more efficient and reliable. And the Encrypting File System (EFS), first introduced in Windows 2000 is enhanced, plus there are numerous new file and print features in Windows Server 2003. These include remote document sharing using Web Distributed Authoring and Versioning (Webdav), to enable files to be accessed and shared using an HTTP browser or web-based application.

File system availability is addressed with a new Automated System Recovery (ASR) facility to provide a one-step restore of the operating system in recovery situations. There's also a new Volume Shadow Copy

option that takes point-in-time snapshots of important data volumes. Third party backup programs have long provided this facility, but it's now built into the operating system, enabling open file backups to be taken without the need for special backup agents. The Shadow Copies feature also allows users to find previous versions of files themselves, using Windows Explorer, although special client software (included) is required.



The new Shadow Copies option in the Windows Server 2003 takes point-in-time snapshots of specific volumes, enabling users to find previous versions of their files themselves



With so many new options, it can be a bit daunting getting to grips with everything, but storage management is also enhanced with improved graphical interfaces that make life easier. Remote administrators will find new command line utilities for many of the disk management tasks such as shadow copy configuration. The defrag tool and CHKDSK utility have both been improved, while on the printer front there's support for over 3,800 new devices, 64bit printing support and performance improvements. Wireless printing is also supported in Windows Server 2003 and there's now better interoperability with other server platforms and a much enhanced printer management interface.

## A better directory?

Introduced in Windows 2000, Active Directory (AD) effectively replaces NT-style domains with a single, much more scalable, distributed directory service. This is of most benefit on large, multi-server networks, with Active Directory storing information relating to all network resources in a single location, and the information store itself able to be distributed across multiple replicated domain controllers for fast and efficient access.

Unfortunately, the initial implementation of AD wasn't without problems, mainly when it came to scalability and performance, but also in the way in which the directory was managed. That led to poor take-up of the Microsoft directory, even among large enterprise customers.

Active Directory in Windows Server 2003 attempts to tackle these, and other problems, and encourage more companies to use it on their networks. No exact figures are being given as to how the changes will affect scalability and performance, but Microsoft is hoping that the improvements will lead to Active Directory being used to provide directory services in a wider context, for example, in support of large scale extranet applications.

Inevitably, there are lots of detailed changes in the new Active Directory implementation, some very technical in nature, but the more important relate to performance and scalability and are fairly easy to understand. For example, where domain controllers are distributed out to remote branch offices, users no longer need to access a central global catalogue server every time they log on. A requirement of the Windows 2000 implementation, this caused real problems in terms of performance and reliability, especially where slow Wan links were involved.

A new 'Install replica from media' feature is also of help here. In Windows 2000 the initial replication of the

**It's now possible to edit multiple objects at the same time when managing an Active Directory domain, and to save and re-use queries**

**The Group Policy Management console, running on Windows servers and XP workstations, provides a one-stop interface for all group policy management activities**

domain could take a very long time when performed over a Wan connection. Now replication can be done using removable media, such as re-writeable CDs.

Wider replication of directory information has also been enhanced. For instance, when group members are added, deleted or changed only the changes are replicated rather than the whole group, as in the previous implementation. Administrators are also given a greater say in the type of information to be replicated both within and across domains, to improve throughput. It's also now possible to disable compression of replicated data on high-speed networks to reduce the load on host processors and again improve performance.

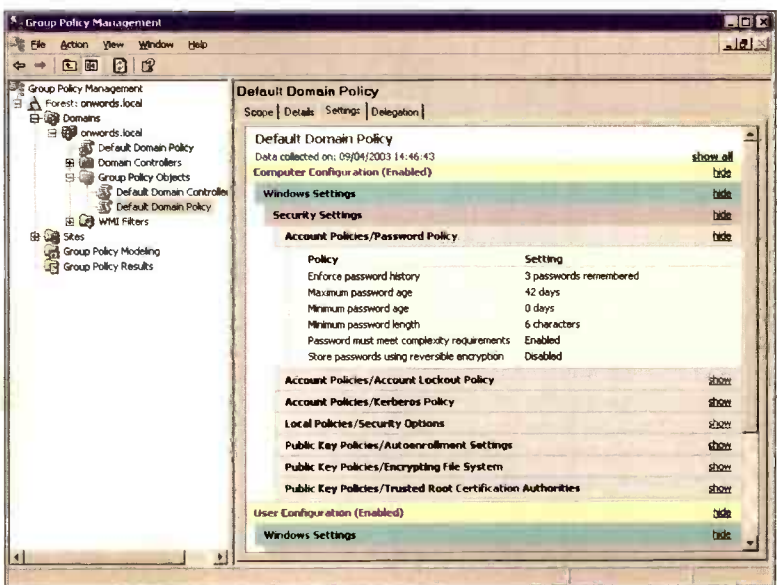
On the management front, the various MMC (Microsoft Management Console) plug-ins for Active Directory have been updated to provide drag-and-drop facilities. The ability to perform operations on multiple objects has also been added, and it's now possible to save and re-use Active Directory queries.

Another neat new feature is the ability to change the DNS and/or Netbios names of existing domains when, for example, companies acquire or merge with others. This does away with the need to build a new domain and migrate directory objects to it. Upgrading to AD is made easier too, through enhancements to the Active Directory Migration Tool (ADMT), which now allows passwords to be migrated from earlier NT and Windows 2000 domains and for common migration tasks to be scripted.

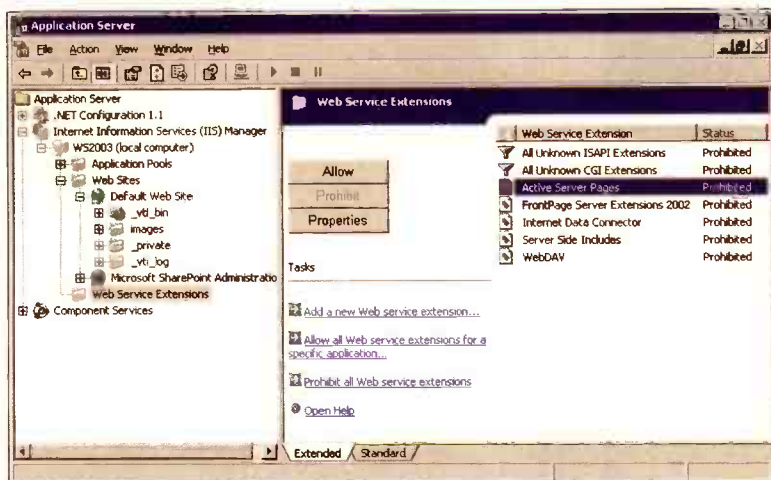
Elsewhere, group policy, a feature that depends on Active Directory, has been enhanced with around 150 new policy settings. There's also a new Group Policy Management Console (GPMC) which can be run on Windows servers and XP workstations and replaces a clutch of tools previously used to manage these settings.

All the functionality provided by the previous Windows 2000 management tools is replicated in the new GPMC utility. Additionally, it allows group policy objects (GPOs) to be backed up and restored. It also features HTML style reporting and helps simplify management of the security related Group Policy settings.

Support for the latest version of LDAP, the industry-standard Lightweight Directory Access Protocol, is another feature of Active Directory in Windows Server 2003, and there are numerous security enhancements to the directory service. As with the performance and scalability claims, only time will tell just how effective these are. It's worth noting that, although a lot of thought has gone into







making the new directory compatible with the old version, those companies wanting to get the full benefit of what it now has to offer will have to upgrade.

## A more powerful and robust IIS 6

No new implementation of the Windows operating system would be complete without an update to IIS, the Microsoft web server software. However, in Windows Server 2003 you get more than just an update. Indeed the new IIS 6 web server introduced here features a totally new request-processing architecture, which should make it a lot more robust and powerful than before.

The key change with IIS 6 is the ability to run web sites and applications using their own self-contained worker processes, preventing them from interfering with or stopping other sites and programs. The main web server code and associated web administration service similarly

**As with the main Windows Server 2003 code, the default install of IIS 6 leaves the web server in a secure locked-down state, able only to serve static pages unless otherwise configured**

## 'IIS 6 is more than just an update. It has a totally new request-processing architecture, making it more robust'

have their own dedicated processes, making it harder for rogue code to bring the core server down. Unfortunately, some applications may not work correctly when isolated in this way, so IIS 6 can also be switched into so-called IIS 5 isolation mode to provide backwards compatibility with the earlier way of working.

The new architecture is also designed to improve performance, particularly where server-side application processing is involved. There's support for multiple application pools (these allow common worker processes to be shared) instead of the one in IIS 5, and enhancements in load balancing that should also improve performance. Indeed, Microsoft has made big claims for the new web server, quoting gains of up to 100 per cent with some ASP applications. We didn't achieve anywhere near that in our tests (see page 171), but there are real improvements to be had with the new software, leading to faster sites and applications and greater scalability.

Security is also much enhanced in IIS 6. First, the web server has to be expressly installed and the default installation when selected is minimal, just as with Windows Server 2003 itself. In fact, by default the web server will normally only serve static pages. Extensions,

for instance, for Active Server Pages (ASP) and Front Page, have to be specifically enabled before any web applications can be deployed.

To this end there's also a new application server role that can be configured using the Manage Your Server utility. This installs not just the IIS software, but other components needed to support web-based applications such as ASP.NET, COM+ and Microsoft Message Queuing (MSMQ), along with the tools needed to manage them.

Other security changes include running IIS worker and ASP processes with very low access privileges, to lessen the impact of any potential security vulnerabilities, and removing the facility to run command line tools via the web server, a feature often exploited by would-be hackers. To stop those who do gain access from defacing sites, the Microsoft web server will now prevent anonymous users from overwriting content.

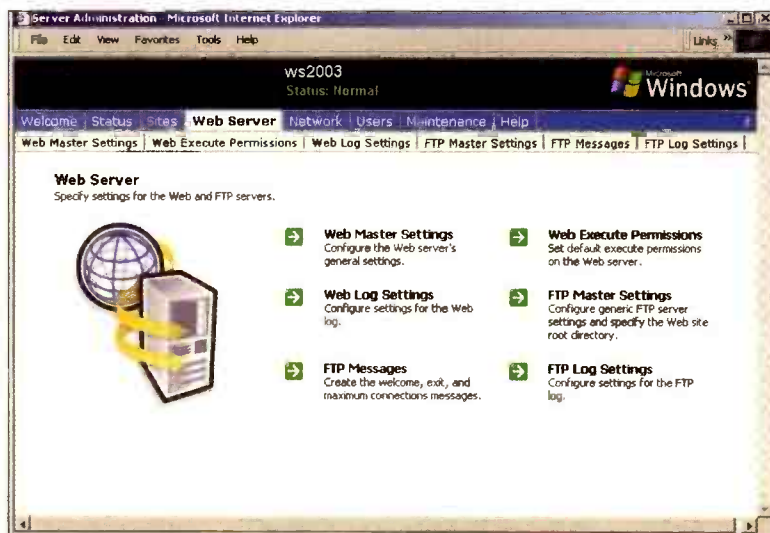
Administrators can also limit the amount of data users can upload using the new web server, and it's good to note that IIS 6 worker processes will now detect buffer overflows and stop running the associated code, should one occur.

Support for Secure Socket Layer (SSL) comes in for an update in IIS 6 too, primarily for greater performance and scalability, but also to make it easier to offload SSL processing to third-party accelerators. User authentication using Microsoft Passport is another new addition, and IIS 6 extends the use of a new authorisation framework included in Windows Server 2003 by providing gatekeeper authorisation to specific URLs.

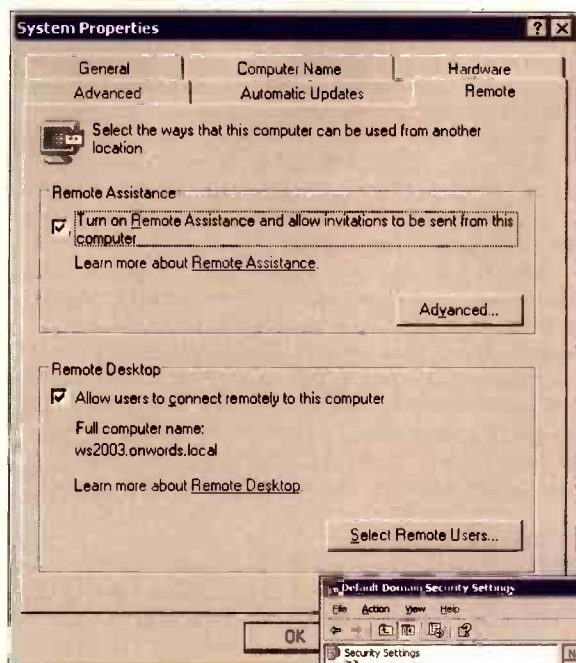
Management inevitably gets updated with, in particular, new capabilities for administrators who need to manage multiple websites and servers. For instance, IIS 6 replaces the binary web server configuration store (metabase) with plain text XML files, which can be edited directly and copied to other servers to replicate a given setup. Similarly, Windows Management Instrumentation (WMI) and improved command-line support make for easier remote administration with a new web-based administration console also included as part of the IIS 6 release.

Lastly, as with the core operating system, IIS 6 is available in 64bit format for use on Itanium processors, and there are improved patch management facilities to enable updates to be applied without shutting down the whole server.

There's a new kernel mode cache for dynamic content, better support for industry standards such as XML and Soap, and other improvements too numerous to include here, all designed to enable IIS to better compete with



**More power to remote fingertips: a new web-based administration console can be used to manage the IIS 6 web server remotely via a browser**



**The Remote Assistance and Remote Desktop options introduced in Windows XP are included as standard in Windows Server 2003, along with facilities to allow for remote headless management**

the new server operating system as well as Windows 2000 and XP products.

On the downside, the management facilities in the new operating system are very much targeted towards single-server management. So, to cope with larger multi-server sites and for wider network management, you still have to add on extra tools either from third-party developers or from Microsoft. Those include Systems Management Server (SMS) for inventory and software distribution services, Microsoft Operations Manager (MOM) for event consolidation and alerting and Application Centre for web application deployment.

### Adding the trust element

One reason for the delays in launching Windows Server 2003 was the need to make sure it was as secure as possible, as part of Microsoft's 'Trustworthy Computing' initiative. Several new features have been added as a result, including the Common Language Runtime (CLR), a new component designed to reduce the number of bugs and potential security flaws that could result from application programming errors.

To achieve this aim, the CLR verifies that applications can run without error and checks for appropriate security permissions as well as making sure that code only performs authorised operations. For example, it checks for things such as where the code was downloaded or installed from, whether it has a digital signature or not and whether the code has been altered since it was signed.

Additionally, the digital certificate services introduced in Windows 2000 are enhanced, with 2003 also supporting two-stage authentication using physical tokens such as smart

Apache and other web server platforms.

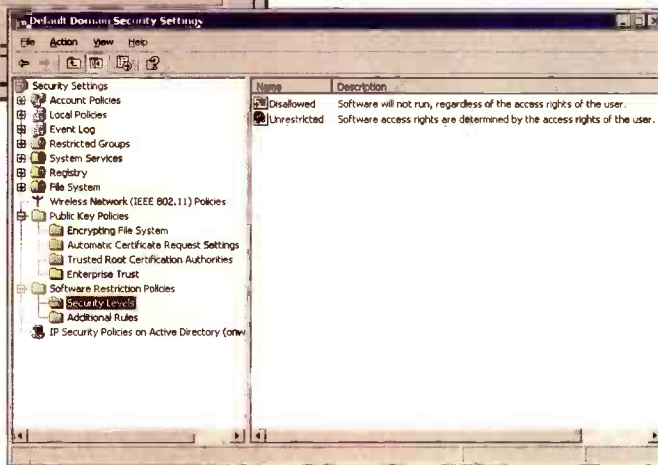
There's much much more to the new management facilities included in Windows Server 2003, aside from the Group Policy Management Console and updated MMC snap-ins for Active Directory management. There's also a useful new tool called Resultant Set of Policy (RSOP), which allows administrators to determine, in advance, what the net effect of changes to Group Policy and other settings will be on real users and systems. These, though, aren't the only advances with so-called 'headless server management' one of the key features of the new operating system.

### Headless management

Headless management is all about enabling access to the server remotely without the need for graphical remote control software like that provided by Terminal Services in Windows 2000. That is still included (it's now called Remote Desktop for Administration – just as in Windows XP) but, in addition, the new server software also includes numerous new command line utilities. Plus there's support for Telnet access, Windows Management Instrumentation (WMI) and Windows Scripting Host (WSH), which help simplify remote management in rack-dense and blade server environments.

Other important new tools include Emergency Management Services (EMS) and the associated Special Administration Console (SAC) to allow out-of-band remote console access even when Windows is non-functional, for example, during startup or following a server crash.

The Remote Assistance facility introduced in Windows XP has also been added to the server operating system, along with support for automatic downloading and installation of software patches using the Windows Update service. Updated drivers can similarly be downloaded and installed, and Remote Installation Services (RIS) can now be used to install all versions of



**The need to get security right delayed the launch of Windows Server 2003. Among the features Microsoft added are options to manage wireless security and restrict the ability of software to execute in a domain**

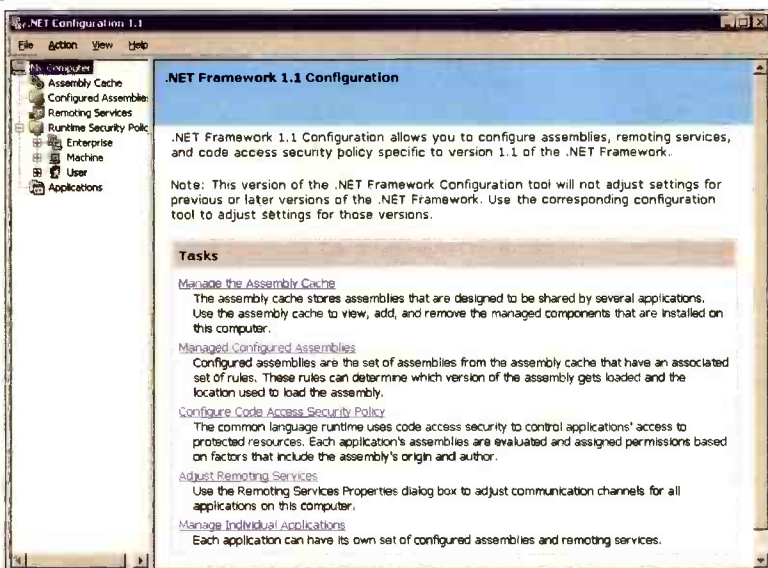
cards. Together with improved Certificate Revocation List (CRL) capabilities, these features enable companies to more easily implement their own public key infrastructure (PKI) and to do so without the need for extra software. That said, Microsoft faces stiff competition in this area from vendors who offer broader platform support and much simpler management, even though the fact that PKI services are now fully integrated into Windows is a point in its favour.

When it comes to more mundane – though nonetheless necessary – security protection, Windows Server 2003 now comes with an Internet Connection Firewall, much like that included in XP. It can be used with Ethernet, dial-up, VPN and PPPoE connections. Security for wireless networking is another new addition and the Internet Authentication Service (IAS) has also been enhanced in the new server.

Cross-forest trusts can also be configured on Active Directory networks using a new wizard, and there's a policy-driven mechanism to identify software running in a domain and control its execution. Using this it's possible to, for example, identify hostile or un-licensed software and prevent it running on both Windows XP and Windows Server 2003 systems on the Lan.

Finally, a word about the missing bit of the moniker. Just because Microsoft dropped .Net from the name of its new server doesn't mean it isn't a key part of the Microsoft web services strategy. And in case you've missed what that's all about, it's the ability to deploy self-contained building block services on the web, which can be discovered and used by other applications to perform





tasks without the need for custom programming. The .Net Passport service is a good example, enabling applications to authenticate users simply and easily.

Despite the slimmed down name, Windows Server 2003 is fully integrated with the .Net framework and provides native support for all the standards related to web services. Those are led by XML (Extensible Markup Language) and Soap (Simple Object Access Protocol), the XML-based messaging protocol used to encode web service request and response messages before sending them over a network.

The Common Language Runtime (CLR) in Windows Server 2003 is another key component of the .Net Framework, together with a new Enterprise UDDI (Universal Description, Discovery and Integration) service. A kind of yellow pages for distributed web services, UDDI is required to enable applications to find,

**Though it has lost the .Net part of its moniker, Windows Server 2003 is still a key part of Microsoft's .NET initiative for web services**

share and re-use web services and other resources. So by including UDDI services as part of Windows Server 2003, Microsoft is clearly hoping companies will base their web services strategies on its platform rather than its rivals.

However, just because it's crucial to Microsoft's plans for .Net, Windows Server 2003 isn't only about web services. As we've tried to highlight in this feature, it's a lot more besides and very much the next step on the traditional server operating system ladder.

File and print and IIS web server are still prime features, with lots of enhancements too, in terms of performance, reliability, security and manageability, to encourage existing Windows NT or 2000 users to upgrade. There's a lot more besides, such as the new SMTP/POP3 mail server, enhanced clustering, VPN and terminal services which we haven't the space to include. We'll look at some of those features in future issues of PCW, when all the noise around the Windows Server 2003 launch has died down.

## How we tested

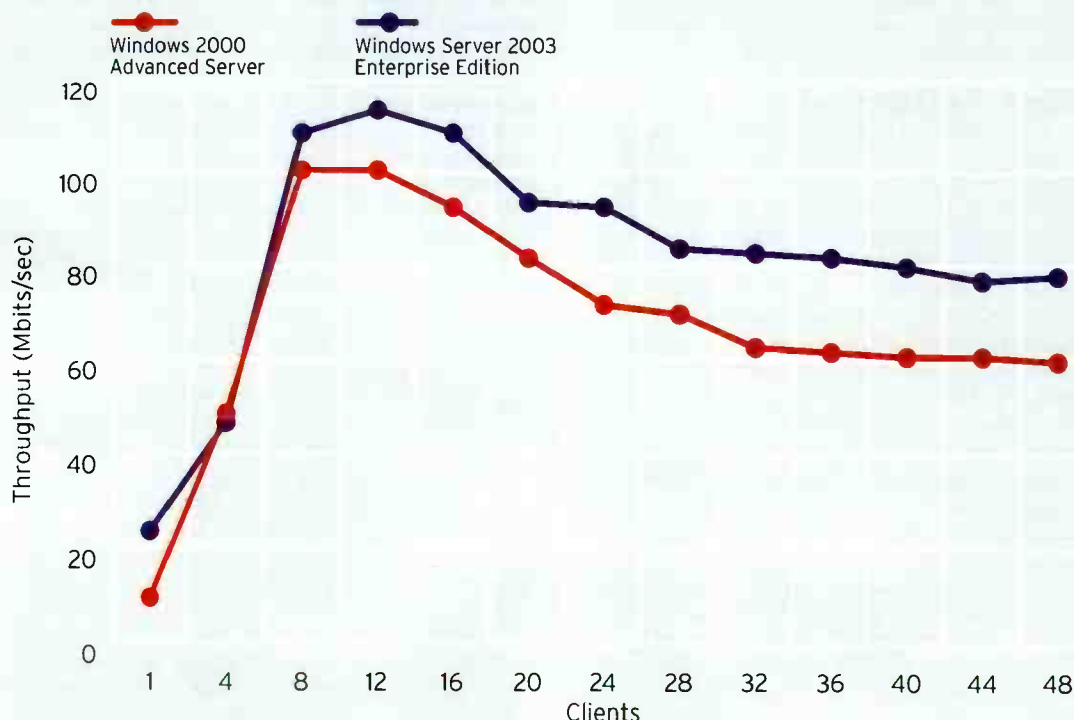
Microsoft makes big claims for the performance improvements possible using Windows Server 2003, but, in the main, these are derived from large scale tests on already very powerful hardware. To test the performance of the new operating system more realistically, we put it through its paces in the PCW labs using ordinary mid-range server hardware connected to our test network.

The tests were run using two standard benchmarks, the first of which – Netbench – is used to gauge file sharing performance on the Lan. The other – Webbench – measures application server performance for the combined operating system and associated web server software, and can also be used to see how well that performance scales when multiple processors are deployed in a server.

## File sharing tests

It's widely understood that file sharing doesn't actually require much in the way of processing power, so rather

**Windows server 2003 - file sharing performance**



Simply by upgrading from Windows 2000 to Windows Server 2003, we achieved file sharing throughput gains of up to 30 per cent, although on a small network the improvements would be less significant

than test the new operating system on a state of the art SMP server we opted, instead, to use a slightly older system. That way we would be able to measure the kind of improvement you might reasonably expect to see simply by upgrading an existing reasonably modern server from Windows 2000 to Windows Server 2003.

The server we used was a Dell Poweredge 2550 with a single 1.26GHz Pentium III processor and 512MB of memory, fitted with Ultra160 SCSI storage. This we tested using Windows Server 2003 (Enterprise Edition) and Windows 2000 Advanced Server, using, as far as possible, an identical file server setup.

Not surprisingly, at low client loads, where the operating system is relatively un-stressed, there was little difference in throughput, such that on small networks there would be no noticeable effect of switching to Windows Server 2003. However, at higher loads, Windows

## 'For a small network with less than 20 users, it's doubtful you'd get an improvement over Windows 2000'

Server 2003 delivered up to 30 per cent more data to the attached clients than the Windows 2000 Advanced Server configuration. That sort of improvement would be obvious on any reasonably-sized network.

### Application server tests

The Webbench application server tests were, similarly, performed using both Windows 2000 Advanced Server and Windows Server 2003 Enterprise Edition. This time they were run on an IBM Xseries 225 server fitted with dual 2.4GHz Xeon processors, together with 1GB of memory and Ultra320 SCSI storage.

We used a client mix where the clients were required to run server-side scripts on the host web server and ran the tests with one and two processors, to see how the different

operating systems and web servers would scale. At low client loads there was little difference, with Windows 2000 and IIS 5 marginally out-performing the Windows Server and IIS 6 configuration. However, as client numbers increased in our tests, the positions were quickly reversed and Windows Server 2003 with IIS 6 consistently out-performed the equivalent Windows 2000 with IIS 5 setup.

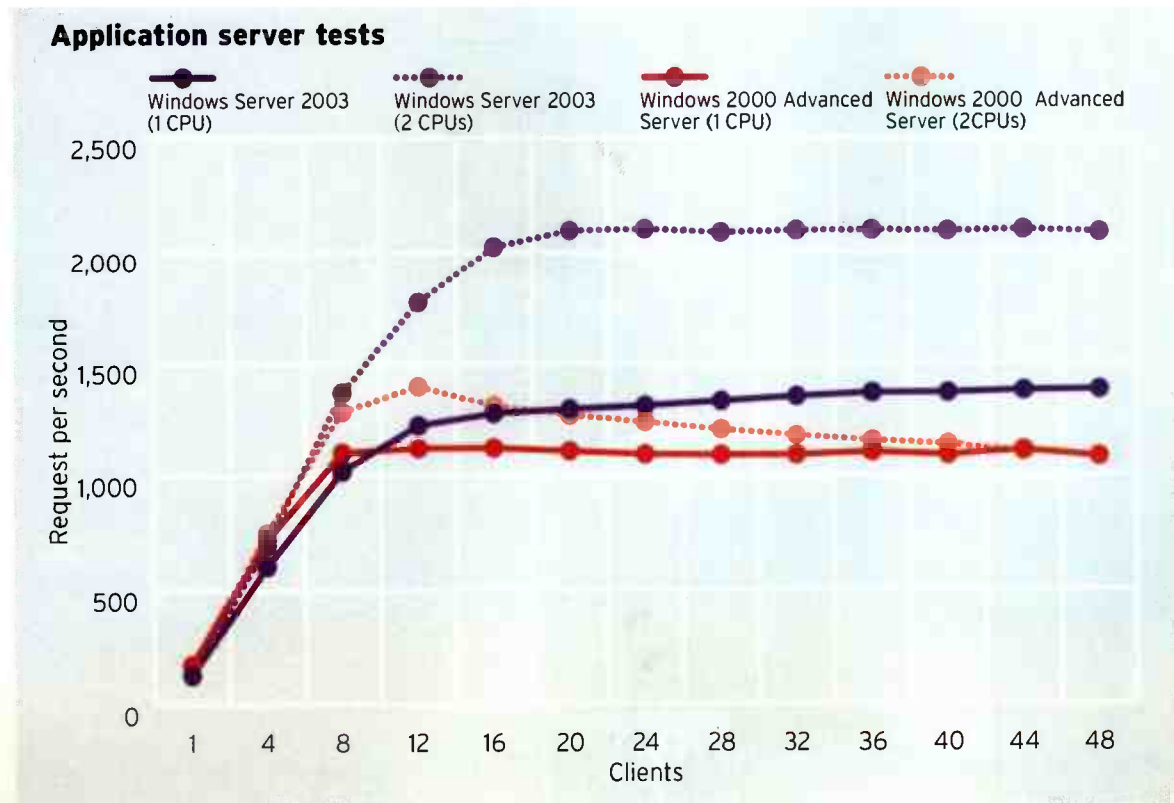
The biggest differences were on a dual-processor configuration where at higher client loads we recorded gains of almost 60 per cent. The new software also scaled better when upgrading from one to two processors.

Even with one processor, Windows Server 2003 was often better than Windows 2000 with two processors fitted, enabling it to support more users and provide faster response times than the equivalent Windows 2000 platform.

### Conclusion

Hardware and software developers are well known for making exaggerated performance claims for their products. In the case of Windows Server 2003, however, many of those claims do turn out to be justified, the only proviso being that it depends on the size of your network and the load put on the server as to whether it's worth upgrading or not.

For a small network with less than around 20 users, for example, it's doubtful whether there would be any noticeable improvement compared to Windows 2000. That's because the server would primarily be used for file sharing, and any gains from the enhanced IIS 6 web server architecture would also be negligible, making an upgrade questionable. However, on larger networks and where Windows servers are used to host public websites, the performance gains are palpable and really worth having. Admittedly we were only able to test with a two-way server and weren't able to test the 64bit implementation, but if the trends we recorded are followed through on such platforms, they too should see significant performance gains using the new Windows software.



Application server results when using Windows Server 2003 were impressive, with better processor scalability and throughput gains of up to 60 per cent compared to Windows 2000



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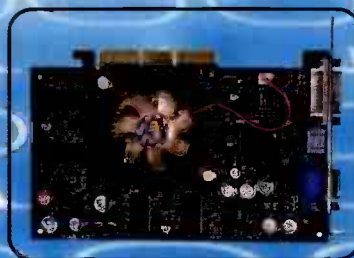


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**Chipset:** SiS651/962L (Integrated SiS315 Graphics)  
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# Hands on



EDITED BY NIGEL WHITFIELD

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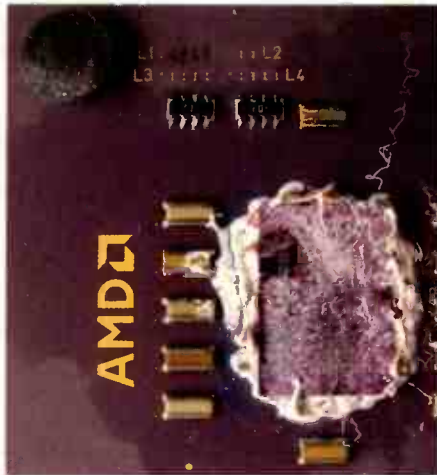
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Digital camera testing in Venice – it's a tough job, but someone's got to do it

With luck, and the lack of a chill following wind, summer will be almost upon us as you pick up this issue of *PCW* to look through the Hands on column. So if your thoughts are turning to holidays, you might well be considering a digital camera to capture the best moments. In this month's Digital imaging column, Ken McMahon looks in detail at two of the best cameras available, and shows off the results from his recent trip to Venice.

Back at home, Guy Kewney has discovered the 21st Century replacement for scowling over the Leylandii – boundary disputes with wireless networks, and looks at ways you can make them a little less obvious.

Meanwhile, in this month's Windows column, it's not so much the 21st Century as the mid-1980s, as Tim Nott takes a look at the Dos underpinnings of the system and how they can still be useful to you, from backing up to problem solving. In the rather more modern world of XP, he looks at how you can maintain your privacy, while Windows 2000 users can find out some of the problems and pitfalls of Windows Update from Terence Green.

In the sound column, Niall Magennis explains how DirectX affects your sound, and looks at some of the tweaks you can make to improve response in audio applications, while the multimedia theme continues in the Linux column, where Barry Shilliday looks at the XMMS multimedia player and how to change its appearance.

Spreadsheet users can find out all the different ways to launch Excel, with templates, blank expenses forms and just about anything else you might want, while in Word processing we look at the ins and outs of font embedding.

You'll also find more on quiet PCs in Gordon Laing's Hardware section, user management for Networks and a discussion of random sorting in Mark Whitehorn's Database column.

There's also a look at the pros and perils of file uploads in Web development, and Tim Anderson's Visual programming explains how you can create layouts that work on every display.

So once again, we are sure you will find plenty useful in Hands on, whether in the columns or in Question time. And if you can't find what you're looking for, drop us a line.

Nigel Whitfield





## Advice from our experts

Our Hands on experts answer your questions and solve your problems

### Databases

**Q** I hate the idea of the euro, and my boss won't buy a keyboard with a euro symbol on it. Can I type the euro symbol into Access?

**Rebecca Wilson**

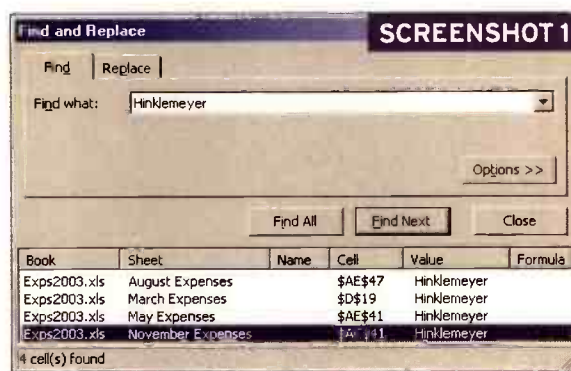
**A** You probably can, but it will depend on your keyboard, Window version and so on. If you are using a standard UK keyboard, try AltGr and the 4 key (AltGr & 4). If that doesn't work or you're not sure where you are in the world, try these other combinations in a hopeful fashion until the euro symbol appears (or until you run out of options).

Alt & 0128 on the numeric keypad is for Arabic, Hebrew, Turkish and US 101 keyboards; AltGr & E is for a large number of European keyboards; AltGr & epsilon is for some Greek keyboards; AltGr & 4 is for UK keyboards (plus Irish and some Latvian); AltGr & 5 works on some other Greek Latin and US-International keyboards; AltGr & U for Hungarian and Polish; and Alt & 0136 (numeric keypad) for Cyrillic keyboards.

**Q** I'm forced to use a dark shade of purple as the background to a form (not my choice at all) and I've seen forms with the text boxes that have a dark box behind them and offset slightly. This seems to me like a rather good way of making them stand out more on the dark colour. Is there an easy way to do this?

**Denis Dawe**

**A** Yes, happily there is. Once you've placed a text box on the form, right-click on it and place the mouse pointer over the Special Effect entry in the popout list. A box will appear with a range of six effects, one of which is the one you describe. It's called Shadowed (hover help names it if you keep the mouse on it for a moment) though I've heard it described as a drop shadow, too. Click to add it as an effect to your text box. Other choices are Raised, Sunken, Etched and Chiseled, with Flat as the default. As usual, you can select multiple text boxes (and/or labels) and add the effect to them all in a single operation.



**Searching all through an Excel workbook**

### Spreadsheets

**Q** Can I search for a customer's name in all the worksheets at once in an Excel 2000 workbook?

**Paul Livingston**

**A** Group all the worksheets by clicking on the first tab, hold down the Shift key, and then click on the last tab. Then press Control & F to display the Find and Replace dialogue box. Enter the customer's name in the Find what: box and click the Find all button. All the instances of that customer will be listed at the foot of the box with the sheet name and cell address (see screenshot 1). To ungroup the worksheets again, right-click on a tab and choose Ungroup sheets.

**Q** I have a table of scores achieved by each of several players for several games. How can I get Excel to display the name of the best player for each game?

**Debbie Stammers**

**A** Supposing the names of the players are the labels for columns B through F and the dates of the games are listed down column A. The results for this example are entered in the range B2:F11. The names of the best players will appear down column G (see screenshot 2). In cell G2 enter: =INDEX(\$B\$1:\$F\$1,MATCH(MAX(\$B2:\$F2),\$B2:\$F2,0)).

The MAX function finds the highest score in the row and the INDEX and MATCH functions work together to find the name of the player who made the score. Drag this formula down from G2 to G11. If, in addition, you would like to automatically emphasise

the highest score in each row, highlight the range B2:F11, select the Conditional Formatting option on the Format menu and make it read Cell Value Is equal to =MAX(\$B2:\$F2). Pick your format, like Bold and Red.

**Q** I download results from FT.com in the format GBX 1.234 and GBP 1234.25, which are in columns. They are downloaded to an Excel csv file before being finally transferred to my Excel spreadsheet. Is there a quick and easy method of deleting the characters and leaving the numerals intact in each cell?

**John Perks**

**A** Assuming there is no delimiter character, and you can't use the Text to Columns Wizard on the Data menu, try this. Enter GBX 1.234 in cell A1 and GBP 1234.25 in A2. In cell B1 enter =MID(A1,(FIND(" ",A1,1)-1)+2,LEN(A1)). Drag this formula down column B. There you are: numerals with the letters gone.

**Q** I have some data in a csv file that I want to incorporate into an Excel spreadsheet. I am using Excel 97 SR-1. I thought I'd import the file into a new sheet in the workbook and link the cells to where I need the data. Then I found that there is no counterpart to the Word Insert File command. The only way I can open the csv file is into a new workbook. I don't fancy opening the file into a new workbook and linking cells across books. Do you have any other suggestions?

**Peter Walker**

**A** You need the Get External Data item on the Data menu. If it isn't there you should install it. On the Control Panel choose Add/Remove programs. Insert your Office 97 CD. Select Add/Remove. In the Maintenance dialogue box choose Add/Remove and then install all of the options included in Data Access. Close out and then you can import your data via Data, Get External Data, Create New Query.

**Q** I've downloaded an Excel file that includes some icons I can't remove. The only way I can get rid of them is by copying everything else



into a new workbook. The icons seem to be superglued to the worksheet. What are these?

Eddie Kerimol

Ah, you're playing with sticky objects. On the Tools menu choose Options, and then View, Objects, Hide All. Now you can use the cells that they covered. They are embedded image objects and you should be able to click on them and see in the Formula Bar a formula like: =EMBED("Paint.Picture",""). Embed is an undocumented function with the syntax EMBED(object\_type,item). You can't enter it yourself.

## Windows 2000

Is it possible to change the drive letter of CD and Zip drives? Following the deletion of a partition there is a gap in the sequence. I also want the CD listed before the Zip.

Philip Parish

Drive assignments in Windows 2000 (and XP) can be changed through Disk Management. Some caveats apply. You cannot change the boot drive (the drive that holds Windows boot files such as NTLDR – usually C:) or the system drive (the drive on which the Windows 2000 system files are installed – often, but not always, also C:). Ordinary user accounts cannot edit drive letter assignments. Use an account with administrative privileges, open Computer Management (right-click My Computer on desktop, select Manage) to access Disk Management. Or, if logged on as a user, use the RunAs tool. Open Start/Settings/Control Panel/Administrative Tools and depress the Shift key while right-clicking on Computer Management. Click on RunAs and enter the administrator password.

Click on Disk Management. Drives are listed in the bottom right-hand pane. You can change the drive letter assignments by right-clicking on the square grey buttons listing Drive 0, CD-Rom and so on. When editing drive letters you can't select a letter that is in use. For example, if the Zip drive is 'E' and the CD drive is 'G' and you want to transpose them you will have to set the Zip to, say, 'P' in order to change the CD to 'E' and so on (see screenshot 3). Depending on the drive letter configuration, you may also need to reboot in between relettering. You'll also see a message warning that changing drive letters may stop some applications from running. You will have to reinstall applications that have been installed on a drive whose letter you wish to change.

## Windows

I recently changed my Internet access from a dial-up to broadband. Consequently, I changed ISPs. On the top of the Internet Explorer bar it usually says '(website) – Microsoft Internet Explorer powered by (ISP)', how do I get rid of my old ISP's name? And perhaps put my new one in its place?

Wai Hoong Chan

There are several utilities to do this for you including Winguides Tweak Manager ([www.winguides.com](http://www.winguides.com)) and Internet Explorer Personalizer (<http://accesscodes.hypermart.net>). If you are happy editing the Windows Registry – and have backed this up or created a Restore Point – it's a very simple hack. Go to HKEY\_CURRENT\_USER\Software\Microsoft\Internet Explorer\Main and edit the 'Window Title' string value in the right-hand pane by double-clicking on it and then typing in whatever you want (see screenshot 4).

I am now happy using broadband but don't seem to be able to persuade the computer to send a fax over the broadband connection, can you advise? I have a Dell Dimension 4550 running Windows XP which has a rather messy fax program.

Harry Kleeman

You can't use an ADSL connection to dial a remote fax machine in the same way you can use an ordinary modem. However, you can use a modem (or a fax machine) at the same time as your ADSL connection, connected to a normal telephone socket. Another alternative is to use one of the many Internet-to-fax gateways such as TPC fax ([www.tpc.int](http://www.tpc.int)). For a long list of free and commercial fax gateways, see Kevin Savetz's excellent FAQ at [www.savetz.com/fax](http://www.savetz.com/fax).

I've set up the scheme from your November 2002 Hands On Windows for printing folder listings, which works fine but is a bit too verbose for me. I really just need a list of the long file names, but there don't seem to be any Dos switches that help.

Chris Beeson

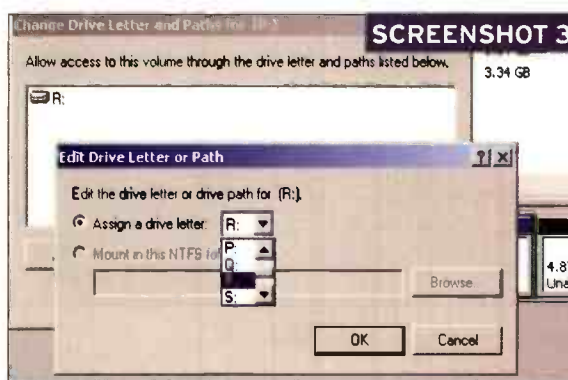
What you need is the /b (brief) switch. Dir /b will do exactly as you ask, and you can use it in conjunction with some other switches. For example dir /b /on will sort the list into alphabetical order.

SCREENSHOT 2

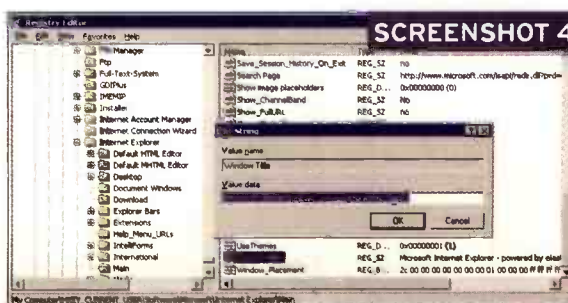
Formula Bar: =INDEX(\$B\$1:\$F\$1,MATCH(MAX(\$B2:\$F2),\$B2:\$F2,0))

		Teri	Sally	Joan	Sharon	Tracey	Highest score
1							
2	4/1/2003	23	45	60	33	19	Joan
3	1/2/2003	40	55	54	39	29	Sally
4	1/3/2003	60	59	44	45	50	Teri
5	29/3/2003	47	54	48	49	55	Tracey
6	26/4/2003	39	48	39	49	39	Sharon
7	24/5/2003	58	59	44	39	29	Sally
8	21/6/2003	61	59	49	41	31	Teri
9	19/7/2003	59	49	62	51	48	Joan
10	16/8/2003	55	47	48	58	59	Tracey
11	13/9/2003	44	55	49	59	58	Sharon

How to find the best player for each game

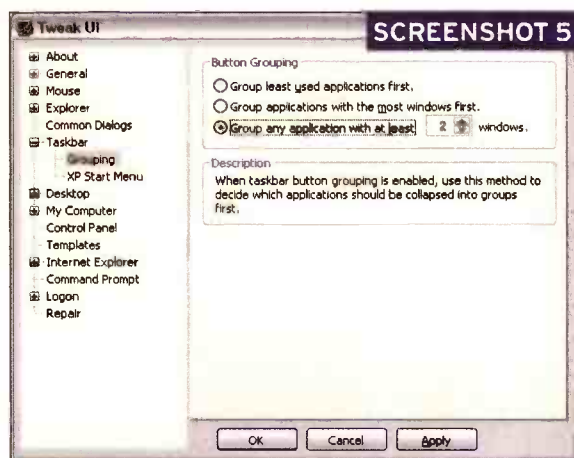


Changing drive letters in Windows 2000

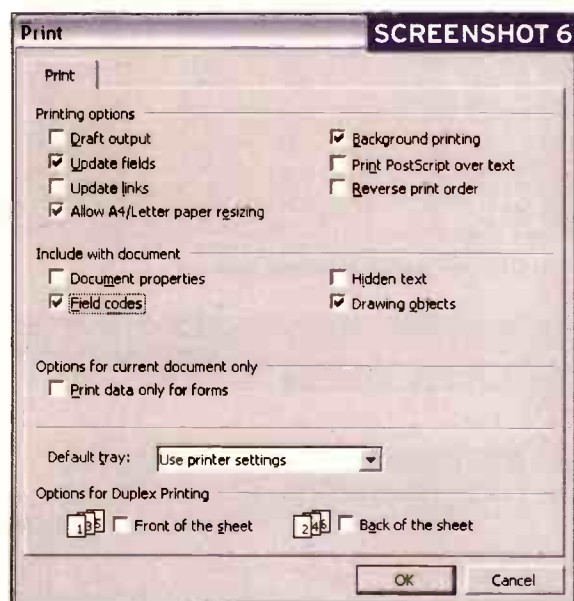


Out with the old ISP, and in with the new on the Internet Explorer title bar

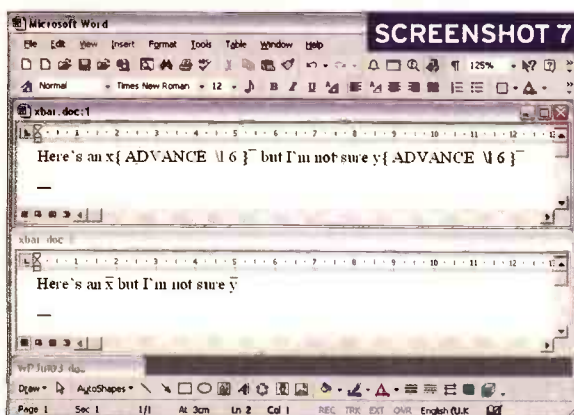




Forcing Taskbar grouping



The mystery of printed field codes



Advance and be overlined

**Q** There is a computer used by most people in my office and there is only one user in our Windows 98 version. People sometimes change the background of the desktop. Is there any way of making the background unchangeable – maybe from the Registry?

Gulamjan Kamalov

**A** Go to HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies and if this does not contain a key (folder icon) named 'ActiveDesktop', create one. Within the 'ActiveDesktop' key, now create a new Dword value named NoChangingWallPaper, and give this a value of 1. This disables the Display Properties Background page, and the 'Set as Wallpaper' option from Internet Explorer. However, it doesn't disable the 'Set as Wallpaper' command in the File menu of Windows Paint, so you will need to remove Paint from the system by going to Control Panel, Add/Remove, Windows Setup and unticking Paint in the 'Accessories' category.

**Q** I remember reading in *PCW* that we can force XP to display one icon in the task bar instead of four separate icons for four Excel or Word files that are open at the same time. Normally this only happens when the taskbar runs out of space. Please remind me how to do this.

Saif Ahmed

**A** There are two issues which need to be looked at here. Word and Excel XP have a 'Windows in Taskbar' option in Tools, Options, View. This behaves slightly differently between the two applications, but in Word this gives each document a separate Window and Taskbar button. The Windows XP Taskbar has its own settings – in Taskbar Properties you'll find an option to 'Group Similar Taskbar buttons'. This is normally triggered when the Taskbar runs out of space, with the least-used items being grouped first. However, Tweak UI for XP has further options: in particular you can force grouping for any application with two (or more) windows open (see screenshot 5). You can download Tweak UI from [www.microsoft.com/windowsxp/pro/downloads/powertoys.asp](http://www.microsoft.com/windowsxp/pro/downloads/powertoys.asp).

## Word processing

**Q** Why do Word 2000 field codes behave as expected in a Word window, but when I print the same document the field code is printed

instead of the result? For example, if I insert 'date and time' and tick the 'automatically update' box on the screen the date is automatically updated, but when I print or preview the same document the field code { TIME \@ "dd MMM.yy" } is printed/displayed. Why?

Knut Jespersen

**A** This is one of Word's rather bizarre printing options. If you go to File, Print, then click on Options, then clear the 'Field Codes' check box, you should then get the field result printed as normal (see screenshot 6).

**Q** In my field of science, there is a convention to write a bar over certain characters (instead of putting a minus sign in front of them). But there seems no ready way of doing this using Word. Various attempts to use Equation Editor or superscripts upset the formatting in addition to being cumbersome. Do you have any ideas how a character could easily be overlined in Word?

Anthony North

**A** Although you should be able to find overlined vowels in the standard Unicode fonts by going to the 'Latin Extended A' subset in the Insert Symbol dialogue, there is, as far as we know, no set of overlined consonants in the Unicode standard. There is, however, a way round this in normal text without recourse to the equation editor. The little-known 'Advance' field can be used to shift the text following left, right, up or down. So, for example, were you to type 'x' followed by an advance field to shift the following text left, followed by the overscore or macron character (Alt & 0175), you could then place the macron over the x. The amount of advance (in points) needed will obviously vary with the font and size, so will take some experimenting, but a value of half the point size is a good starting point (see screenshot 7). Once you've created a symbol in this way, you can save it as an autotext entry such as 'xbar', and in this way collect a set of overscored letters.

**Q** In January 2003 I typed a document with Microsoft Word. Ever since then, every time I open Word, this same document appears. If I then click on 'New blank document' on the tool bar it appears again. I have upgraded to Windows XP and Office Professional, but the problem still persists. So each time I make use



of Word, I have to first delete this document before I can proceed.

**Thomas Etuajie**

**A** This sounds as if your original document has been saved into the default blank template for new documents. The first thing to do is to close Word and use the Windows Search to find the file Normal.dot. If you don't have any custom styles, autotext entries, toolbars or macros, then you can delete this file. Word will create a new version next time it starts. If you do have customisation, then right-click on the file and 'Open' – don't double-click on it or you'll just get another new document. When Normal.dot opens, delete the unwanted text and save Normal.dot.

### Digital imaging

**Q** I am using Pinnacle Studio DV v8.2 and capturing video from my Panasonic DX100B camera. Recording onto DVD is no problem, but I have family and friends who don't have access to DVD. I'd like to record onto VHS (Pal) instead of DVD. I believe there are DV 'gizmos' available but I haven't been able to locate them. Could you give me some pointers to get me on the right path? The camera only has a DV-out facility. Recording back to the camera would allow me to play the movie back through my TV and (I think) record to VHS from the Panasonic TV.

**John Neal**

**A** You can get a 'widget' to enable the DV-in port of your camcorder (disabled by the manufacturer to avoid EU tax on VCRs). If you do this yourself it usually involves connecting the camera to your PC serial port with the 'widget' and using software to change a 2bit code in the camera's firmware. If you don't like the idea of messing with your camcorder in this way (and, incidentally, invalidating the warranty) some companies will do it for you. [www.datavision.co.uk](http://www.datavision.co.uk) lists the Panasonic DX100B as a model for which it currently produces a widget, but you should get your order in quickly. A notice on the site states they are discontinuing widget development, (presumably, though the reason is not given, due to the threat of legal action from manufacturers) and will only be selling widgets while stocks last.

With the DV-in enabled you can record edited movies from your PC back to DV tape on the camcorder. Then you can play the movie back out through the analogue port to a VHS VCR.

### Hardware

**Q** I was planning to build a PC costing less than £500 and wondered if I could use my TV (with a TV-out graphics card) as a monitor.

**Brian**

**A** You could use a TV as a PC monitor, but the picture quality will be very poor. Normal TVs only support low resolutions and flickery interlaced refresh rates, which makes for a terrible-looking PC desktop. The exceptions are high-end projection, plasma or LCD TV sets with special computer inputs. We'd recommend going for a proper PC monitor, even if it's a cheap one. Consider reducing the specification of your PC or using free software to meet your new budget.

**Q** I have built a system with an Athlon XP 1700+ processor, which I believe should have a clock speed of 1.47GHz. Yet my PC is reporting it as running at 1.1GHz!

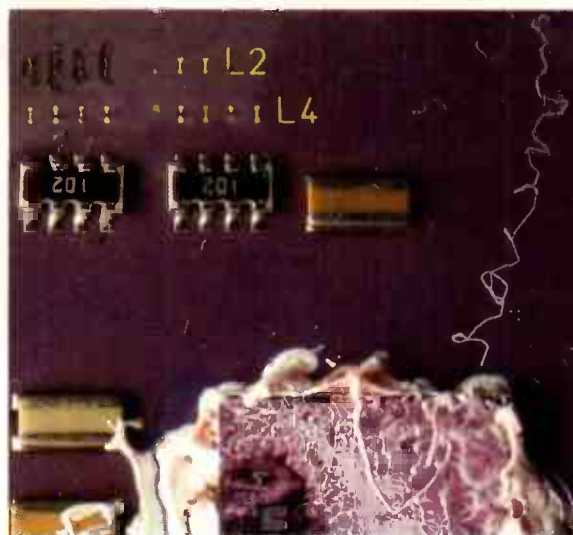
**Daniel Chambers**

**A** This is a common enquiry of DIY PC builders using Athlon XP processors. The problem is the motherboard's front-side bus (FSB) is set to 100MHz instead of 133MHz. Since the Athlon XP 1700+ has a fixed 11-times clock-multiplier, a 100MHz bus will result in it being driven at 1.1GHz. Increasing the bus speed to the correct 133MHz setting (see your motherboard manual) will drive it at the full 1.47GHz. Don't be confused by your Athlon XP claiming a system bus speed of 266MHz – this uses double data rate (DDR) technology, so your motherboard should still be set at 133MHz.

**Q** My PC has been acting very strangely recently. When I first press the power button, the fans start whirring, but nothing else happens. Switching off then on again solves the problem. The trouble is I have to perform this double power-up every time I want to use my PC. I have an Abit KT7A-Raid motherboard and 1.2GHz Athlon processor. I admit I tried the pencil overclocking trick described in Hands on over a year ago, but have been running it normally ever since.

**Terry MacDougall**

**A** You're not alone – users with similar components have reported the same problems after overclocking. The pencil trick mentioned above (Hands on, December 2001) follows an interesting discovery that joining certain tiny contacts on the surface of



If you used a pencil to connect CPU contacts, it might wear off over time

the plastic CPU package unlocks the clock-multiplier, allowing easy overclocking; many enthusiasts found the graphite in a pencil mark delivered sufficient conductivity.

The problem described above, though, normally stems from a lost or poor connection between these contacts. If you still want an unlocked processor, you should reconnect the bridges, preferably with conductive paint – you must be very careful while doing this and use masking tape to prevent the paint from connecting the wrong contacts.

Alternatively, if you're happy with the normal fixed clock-multiplier, you could carefully erase the pencil marks. During any of these processes or even a recent Bios update, the Cmos data may have become corrupted, causing the same symptoms. Consequently, we also recommend clearing the Cmos data as described in the motherboard manual. When next powering up, enter the Bios and key in the correct settings for your CPU and disks. As always, we must remind potential tweekers that overclocking could permanently harm your components and we cannot officially support it.

### CONTACTS

All of our experts welcome your queries, simply respond to the appropriate address below:

Databases:	<a href="mailto:database@pcw.co.uk">database@pcw.co.uk</a>
Digital imaging & video:	<a href="mailto:digitalimaging@pcw.co.uk">digitalimaging@pcw.co.uk</a>
Hardware:	<a href="mailto:hardware@pcw.co.uk">hardware@pcw.co.uk</a>
Networks:	<a href="mailto:networks@pcw.co.uk">networks@pcw.co.uk</a>
Sound:	<a href="mailto:sound@pcw.co.uk">sound@pcw.co.uk</a>
Spreadsheets:	<a href="mailto:spreadsheets@pcw.co.uk">spreadsheets@pcw.co.uk</a>
Linux/Unix:	<a href="mailto:linux@pcw.co.uk">linux@pcw.co.uk</a>
Mobile computing:	<a href="mailto:mobilecomputing@pcw.co.uk">mobilecomputing@pcw.co.uk</a>
Visual programming:	<a href="mailto:visual@pcw.co.uk">visual@pcw.co.uk</a>
Web development & ecommerce:	<a href="mailto:webdev@pcw.co.uk">webdev@pcw.co.uk</a>
Windows:	<a href="mailto:win@pcw.co.uk">win@pcw.co.uk</a>
Windows 2000:	<a href="mailto:win2000@pcw.co.uk">win2000@pcw.co.uk</a>
Windows XP:	<a href="mailto:xp@pcw.co.uk">xp@pcw.co.uk</a>
Word processing:	<a href="mailto:wp@pcw.co.uk">wp@pcw.co.uk</a>
Please do not send unsolicited file attachments.	





**Gordon Laing**

has been a hardware enthusiast ever since his first Sinclair ZX80 and, as a 10-year contributor and former editor of PCW, what he doesn't know about technology isn't worth knowing

# Peace, perfect peace

Is a silent PC possible? We also look at character displays and some very high-end cameras

**O**ne of the most popular subjects in the Hands on Hardware postbag is how to silence the racket made by modern PCs. In May's issue we described how more efficient heatsinks with large, slow-spinning fans can seriously reduce the noise output of modern PCs – QuietPC ([www.quietpc.com](http://www.quietpc.com)) is a good place to look for such components.

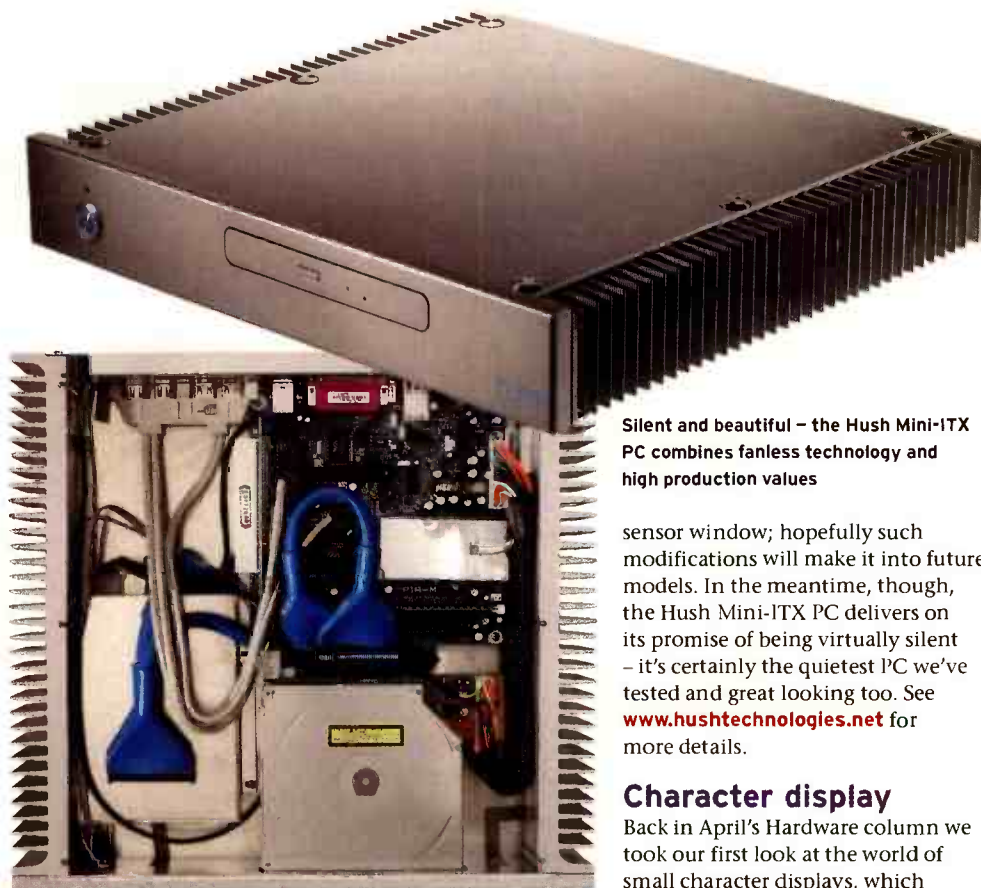
While large fans can be very quiet, they're not completely silent. For the ultimate in peace, you'll need to eliminate fans altogether, but this introduces some serious technological challenges. The high power requirements of modern P4 and Athlon XP systems means fans will always be present for cooling both CPUs and hefty power supplies, but alternative, lower power platforms could provide an answer.

In previous issues we've discussed Via's Mini-ITX platform, which uses tiny 17 x 17cm motherboards with integrated low-power C3 or Eden CPUs. They may not match the raw muscle of a P4 or Athlon, but they are sufficient for many tasks. Indeed the cunning addition of a hardware mpeg2 decoder in the latest EPIA-M models ensures smooth DVD playback.

The tiny dimensions of Mini-ITX motherboards have also resulted in a large array of unique case designs and projects, many of which can be seen at [www.mini-itx.com](http://www.mini-itx.com). Probably the most innovative so far, though, is the Hush Mini-ITX PC, launched at the Cebit show and pictured right. As its name suggests, Hush is a very quiet PC – in fact by eliminating all fans, it's virtually silent.

The Hush case uses passive heat-pipe technology connected to one side of the metal-finned chassis to effectively cool the CPU and chipset without the need for any fans. Better still, instead of a noisy power supply, an external adaptor is used to deliver DC electricity to the system, again without fans.

Since this power supply only delivers 55w (compared to at least 300w on a conventional PC), some concessions have to be made on components. There's sufficient juice to power the EPIA motherboard, one or two modest PCI cards and a normal 3.5in hard disk, but not enough for a standard 5.25in optical



**Silent and beautiful – the Hush Mini-ITX PC combines fanless technology and high production values**

sensor window; hopefully such modifications will make it into future models. In the meantime, though, the Hush Mini-ITX PC delivers on its promise of being virtually silent – it's certainly the quietest PC we've tested and great looking too. See [www.hushtechnologies.net](http://www.hushtechnologies.net) for more details.

## Character display

Back in April's Hardware column we took our first look at the world of small character displays, which enthusiasts fit into PC cases to indicate everything from album titles to the temperature of their CPU. Such displays typically have two or four lines of 16 to 40 characters each, which is plenty for getting across a decent amount of information.

The two main technologies for character displays are Liquid Crystal Displays (LCDs) and Vacuum Fluorescent Displays (VFDs); the former normally displays black text on a backlit background, while the latter uses glowing characters on a dark background.

The display panels by themselves won't do anything without the appropriate controller circuitry, and for use in a PC you'll also need the right connectivity and, ideally, an easy way to mount the thing in a case. Two companies, Matrix Orbital and Crystalfontz, specialise in packaging LCD and VFD panels for PC use, and in April we tested a pair from the former. This sort of prepackaged and mounted convenience doesn't come cheap, though, with prices ranging from £50 to £120 depending on the size and complexity of the display.

**Look, no fans. Opening the Hush case reveals a Mini-ITX motherboard whose CPU and chipset are cooled by a passive heatpipe and case fins. Careful choice of low-power components also allows a silent external power brick to be used instead of a conventional AC supply with noisy fans**

drive. Instead Hush has fitted a lower-power notebook drive, which also has the benefit of allowing a shorter case design – it measures 370 x 340 x 59mm and is available in six colours.

The case also accommodates one or two PCI cards via a riser card, although in the model we tested, one blanking plate was occupied by the motherboard's extra USB2 and Firewire ports. It's certainly a very neat design though, and in use was silent, other than the whirring of the optical drive or the clicking of the hard disk.

Sadly for DIY enthusiasts, the case won't be sold separately, at least for the time being. It will initially only be available as a complete system from Mini-ITX.com; prices weren't confirmed at the time of writing, but expect around £699 ex VAT for a model with an EPIA-M 9000, 256MB of Ram, 80GB disk, DVD/CD-RW combo drive and Windows XP.

With its consumer electronics styling, we'd like to have seen an option for a front-mounted VFD or LCD display, along with an infra-red



Of course if you're handy with a soldering iron you could make your own, and PCW reader Sean Butler-Lee emailed to explain how he'd done just that. He imported a Seiko L2014 4 x 20 character LCD from the US and wired it up using some online diagrams. The display came with a controller chip, so all that was required was to wire up a parallel port connector and power plug with the aid of a few extra components.

Sean reckoned the total cost was around £17.50, which is in stark contrast to the price of prebuilt displays for PCs; the HD44780 controller chip used is also quite common and supported by most LCD software. For information on this project and circuit diagrams, head over to the panel supplier's website at [www.eio.com/lcd2014.htm](http://www.eio.com/lcd2014.htm).

In the meantime, though, most of us will be using prepackaged displays, and, as discussed in April's issue, one of the biggest inconveniences is their connection with the PC. Generally they'll use parallel or nine-pin serial plugs, which means having to feed a cable out of the back of your PC case in order to connect it to the right port. A far more elegant solution is to use internal motherboard connectivity, but few sport internal headers for serial or parallel ports.

Most modern motherboards do, however, feature at least two onboard headers for additional USB ports. Traditionally these would be wired up to blanking plates to deliver spare external connectivity, but there's no reason an internal device couldn't be connected directly to the header. Several manufacturers, including Shuttle, are preparing internal Wireless Lan or Bluetooth adaptors that are designed to fit directly onto internal USB headers; better still, the USB header could also power the device, meaning only one cable is required.

Thankfully, the main LCD and VFD packagers are getting in on the act, with new displays offering USB connectivity. Matrix Orbital has its LK202 2 x 20 character LCD in a variety of colours for \$74.99 (£48 approx) plus shipping from its US website, or £68.93 ex VAT (including case bezel) from UK distributor Kustom PCs. Crystalfontz alternatively offers its 632 16 x 2 character or 634 20 x 4 character LCDs, again in a variety of colours for \$42 or \$75 plus shipping respectively.

Crystalfontz does not have distributors so you'll have to buy direct from its US-based website.

## Crystalfontz display

Since April's issue featured a pair of Matrix Orbital products supplied by Kustom PCs, we decided this month to try out Crystalfontz. We ordered one of its larger 634 displays with white characters on a soothing blue background. This model may feature USB connectivity, but on the back you'll find only a mini connector which requires a special Crystalfontz cable costing \$5. In a bizarrely missed opportunity, this cable is both too long and terminated with a standard external USB plug. Since most of these displays would surely be mounted inside PC cases, a more useful cable would be relatively short, and terminate with an internal USB header plug. At least it's fairly simple to cut the cable short and fit your own internal plug.

Crystalfontz uses Federal Express for international shipping and offers advice on how to fill out the required form declaring package weights, along with estimating the total cost. Our 634 display with cable and shipping worked out at £60.07. Despite Crystalfontz warning the display would be out of stock for at least one month, it duly arrived two days later. Sadly a customs form followed shortly afterwards asking for an additional £17.80.

Unfortunately no operating system yet includes software to directly drive character displays, so you'll need to install your own. Fortunately there's a wide range of utilities designed to extract specific data from applications and send it to a connected display – there are links to all the popular ones from the Crystalfontz website. The company also offers its own Crystal Control software as a free download, which can talk to Winamp, Motherboard Monitor, various game and email servers, along with Windows' own Performance Manager and disk or memory statistics.



**The Crystalfontz 634 20 x 4 character LCD is one of the first to use a USB interface. Displaying song titles and system temperatures has never been easier**

The one thing most display utilities have in common, though, is support for hardware connected to conventional nine-pin serial ports. Crystalfontz has taken this into consideration and offers a driver download from its website for USB displays, allowing them to act as if they were connected to an old-fashioned serial port. Just tell the driver which port it should be emulating, then direct the display utility to the same port and you'll be fine.

Once this has been configured, operating the Crystalfontz USB display is the same as any other. Simply set up a number of events which extract and display the required information from various applications. Annoyingly, certain display utilities may not be able to extract data from all your applications, but swapping to a different one may prove productive. It's a case of experimenting and reading through the newsgroups and forums on the display manufacturer and utility websites.

**11megapixel resolution and a full-frame sensor – Canon's EOS-1Ds is the best quality digital camera we've ever tested, but at over £6,000, you'd certainly hope so**

## Best ever camera

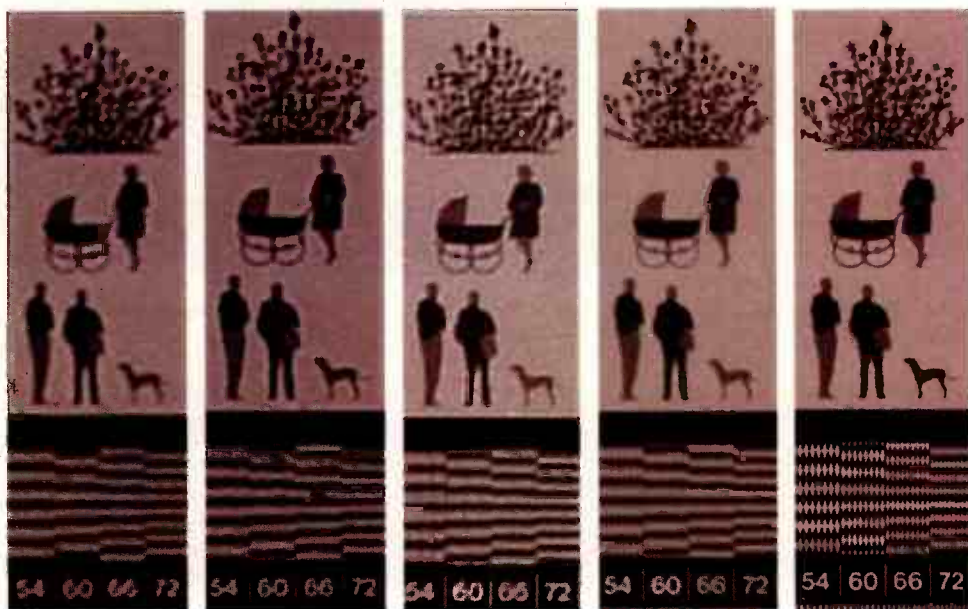
Since their first release in the mid-1990s, digital cameras have enjoyed ever-increasing resolutions; indeed considering the first model sported just one-third of a megapixel, it's impressive how quickly this market has developed.

Higher resolutions allow bigger enlargements, or greater latitude, when it comes to cropping an image, but there is, of course, a limit to everyday usefulness. Judging by the plateau reached by most of today's top-of-the-range consumer and prosumer models, it would seem 5megapixels is the point at which most users are satisfied. Since such images have sufficient detail to make great-looking 13 x 10in colour inkjet prints, we'd be inclined to agree the manufacturers have got the numbers right for most people.

Professional photographers aren't 'most people' though, and the digital market for such users continues to evolve at a fast pace. Putting aside high-end backs for medium format cameras, the real action is in the digital SLR market,







which are essentially filmless versions of existing 35mm models.

Until recently, most digital SLRs had two main technological drawbacks. First their resolving power, while higher than consumer cameras, was way below that of 35mm film. Second, their imaging chips were smaller than a frame of 35mm film, which meant any lenses had their focal length multiplied by around 1.5 times. While great news for telephoto fans, this has long been a frustration for wide-angle lens users. Worse, the smaller sensor size was reflected by the cropped view through the viewfinder, which more resembled peering through a letterbox.

The holy grail for 35mm SLR owners who want to go digital is a model with an ultra-high-resolution sensor that's exactly the same size as a frame of 35mm film. The issues with a large sensor size are mostly to do with manufacturing costs. Matching the resolving power of 35mm film though is more contentious.

Judging by the number of 2,700dpi 35mm film scanners around, you'd imagine this is the sort of level you'd want to match. Roughly speaking, this translates into an 11megapixel camera. That said, getting every last drop out of ultra-fine grain professional film such as Fuji Velvia may require nearer 4,000dpi, which in turn would demand a camera with around 24megapixels. To be honest, if you're waiting for a 35mm-bodied digital SLR with more than 15megapixels, you could be in for a disappointment, as most manufacturers look like sticking with between 10 and 15 at most, working at lowering prices over the long term.

To compare the resolutions of modern digital cameras we've cropped and enlarged a small portion of an optical test target; the above samples represent a 7.5cm tall cutout from a 50cm tall print. From left to right: 3 and 5megapixels from prosumer cameras, 6megapixel output from a 3.3megapixel Fujifilm SuperCCD, 6megapixel from a digital SLR and 11megapixels from the Canon EOS-1Ds digital SLR

Arguments of ultimate film resolution aside, the truly exciting news for professional photographers is the arrival of two digital SLRs which technologically fulfil what most people have been waiting for. Canon's recently released EOS-1Ds and Kodak's forthcoming DCS-14n both sport full-frame 35mm sensors and resolutions of 11 and 14megapixels respectively. As such, they resolve similar detail to 35mm film, and all lenses perform as intended.

Such power doesn't come cheap, though, with Kodak's model expected to cost up to £4,000 and Canon's already on the street for around £6,000 inc VAT. While these prices place both cameras well out of range for most photographers, it's relevant to test their performance, as this or similar technology will doubtlessly filter into more affordable products in future. At the time of writing, Kodak's DSC-14n remained unreleased, but we got hold of a Canon EOS-1Ds and put it through its paces.

## Image tests

For the purposes of this column we primarily wanted to test its resolving power and see how it compared to models which came before. Just briefly, though, we should say the EOS-1Ds looks, feels and handles like a digital version of the EOS-1V 35mm film SLR, (with the optional power booster attached). It may be fairly large and heavy, but it handles like a dream.

Our resolving power test involves photographing a wall-mounted target measuring 70 x 50cm from a distance of approximately 170cm, using each camera's best-quality jpg mode. Each camera's lens focal length was adjusted so the target horizontally

fills the frame; for most models, this involved using an equivalent 35mm focal length of about 60mm.

In order to show the differences on the paper used in PCW, we have had to significantly crop and enlarge the results. On this page, the cropped portion originally measured 2 x 7.5cm; it is therefore reproduced almost 100 per cent actual size, which translates into effectively making a 70 x 50cm print from each image, then cutting out a small portion in the middle.

For comparative purposes we have printed results from a Sony DSC-S70 (3megapixel), Sony DSC-F717 (5megapixel), Fujifilm Finepix S602 Pro (6megapixel SuperCCD output), Canon EOS-D60 (6megapixel) and Canon EOS-1Ds (11megapixel). The EOS-1Ds significantly out-resolves everything else, and this is reflected in the amount of detail in its image.

This is also a good opportunity to compare it to the detail resolved by the considerably more affordable Canon EOS-D60, which is soon to be replaced by the EOS-10D. Both of these 6megapixel models may use physically smaller sensors with focal length multiplications around 1.5 times, but with street prices below £1,500, they are a much more realistic proposition.

For reference we've also included three high-end consumer models. Notice how the 6megapixel output from a 3.3megapixel Fujifilm SuperCCD resolves roughly the same level of detail as a traditional model with 3 to 4megapixels.

Ultimately the high price of Canon's EOS-1Ds puts it out of reach for the vast majority of photographers, but in terms of technology it's a very important product. Until now, digital SLRs have compromised on resolution, lens coverage or both. With the EOS-1Ds (and Kodak DSC-14n), the technology has finally reached the level most 35mm SLR owners have been waiting for. Now all we have to do is sit back and wait for prices to become more affordable. In the meantime though, it does illustrate the superb value, flexibility and performance of film-based 35mm SLRs.

## CONTACTS

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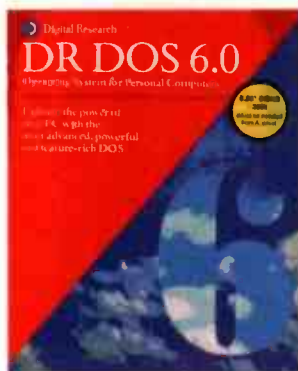
# Dos for younger readers

We go back in time with some Dos tricks and uncover some more Registry tips

**D**os is the Latin of personal computing, in that it's obsolete, requires effort to learn, and is much more useful than you might expect. Dos and MS-Dos are now generally taken to be synonymous, but that was not always the case. Let's step back in time to 1980, when IBM was about to launch the personal computer based on the 16bit Intel 8088 processor. These computers urgently needed two pieces of software: an operating system and a programming language. Digital Research, owned by Gary and Dorothy Kildall, had an operating system called CP/M (Control Program for Microcomputers) which had sold over 500,000 copies. Although this was an 8bit OS, the company had a 16bit version in the pipeline. In what is now an industry legend, when IBM turned up for a meeting with the Kildalls, Gary was out flying his plane, and Dorothy balked at signing the draconian IBM non-disclosure agreement.

On the programming language side, IBM was already doing a deal with a Seattle-based company founded by Harvard dropout Bill Gates and his school friend Paul Allen. So IBM asked if Microsoft, as the company was called, could supply an OS. Gates and Allen didn't have an OS – let alone their own planes – but they knew someone who did. So, for a reported \$50,000 Microsoft bought QDOS (Quick and Dirty Disk Operating System) from Tim Paterson's Seattle Computer Products, and rebadged it as MS-Dos.

Throughout the 1980s, development continued, and other brands of Dos emerged, the most notable being from Digital Research, but Microsoft's headstart gave the company an unassailable position. In 1991, DR-Dos 6 (pictured above) launched, outperforming the current and dismal Microsoft MS-Dos 4. It included drive-compression software, disk read and write caching, task-switching, memory optimisation and other features that were hitherto only available as third-party utilities. Shortly after this, Digital Research was acquired by Novell and, under the new dynamic management DR-Dos faded rapidly from sight.



First with disk doubling, disk caching and pictures of clouds on the box

It is not dead, however – in 1996 the Linux distributor Caldera acquired the product, and in 2002 Device Logics acquired it and appears to be reviving the product, both as an embedded solution and a desktop OS. There's even a DR-Dos web browser, but I'm getting dangerously off-topic so suggest that you go find out for yourself at [www.dr-dos.com](http://www.dr-dos.com).

Command line aficionados might also like to visit [www.jpsoft.com](http://www.jpsoft.com), the home of another veteran, 4Dos.

Despite the fact that MS-Dos effectively fossilised in 1993 with version 6.22, there are still things it can do that Windows can't, and it can also be useful in rescuing a PC from a damaged Windows installation. You can run MS-Dos in two ways: in a command-prompt window inside Windows, or in 'real

are, for example C:\Windows> followed by a flashing underscore waiting for you to type in a command. If you type cd (change directory) followed by a path, for example, cd c:\myfolder\stuff, you will then be 'in' that directory and the prompt will change accordingly. You need to press the Enter key after each typed command. If you just want to go down a level, say from Windows to Windows\System, then you just need to type cd system. Conversely, if you want to go up a level, type cd.. or cd\ to jump up to the root (top level) of the drive. If you want to change to a different drive just type its letter followed by a colon.

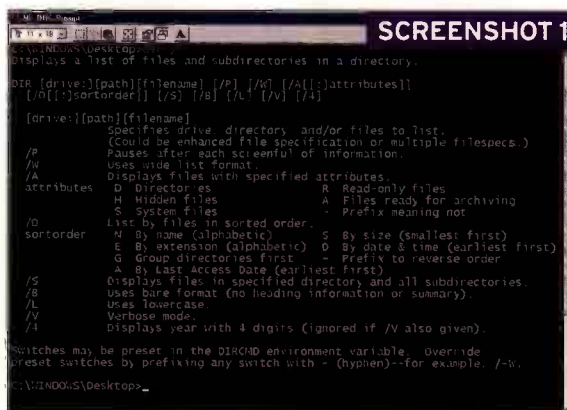
There's a slight complication here. Real-mode Dos doesn't understand long file or folder names. If you want to reference a long folder name then you have to use the truncated form, which consists of the first six letters (without spaces), followed by a tilde (~) followed by a number. Hence My Documents becomes mydocu~1, and if you also had a folder named My Documentaries that would be mydocu~2. In an MS-Dos window, things are a bit easier as it will show – and respond to – long file names, but it still can't handle spaces. You can either use the truncated form, or enclose the long file name (with spaces) in quotes.

## MS-Dos fossilised in 1993 but there are still things it can do that Windows can't

mode', that is, booting straight into the MS-Dos environment. The latter is an option in the Windows 98 and 95 boot menus, but not in Windows ME: however you can boot any PC to real-mode Dos from a floppy disk.

So, let's look at some of the most useful commands in Dos. First, getting around. Usually you want to be 'in' a particular folder – or directory in Dos-speak – to carry out a command. Normally the command prompt should tell you where you

The /? switch gives the lowdown on most Dos commands



### Basic commands

So, having mastered the intricacies of navigation, it's time to a look at what you can do. DIR shows you the contents of a directory. On its own it censors this information, not showing directories or files that have their hidden or system attributes set. To see these you have to use the /a switch; DIR /a/s, for example will show just system attribute files. There are several switches you can use with the DIR command (see this month's Question time for one) but I'm only going to mention one more, as the /? switch tells you all about the rest (see screenshot 1).

ATTRIB is used to set attributes for files and folders. Operation is straightforward enough: + or - followed by r a s or h, followed by the filename, turns on or off the read-only, archive, system or hidden attributes. So what are these attribute things? They don't do anything in

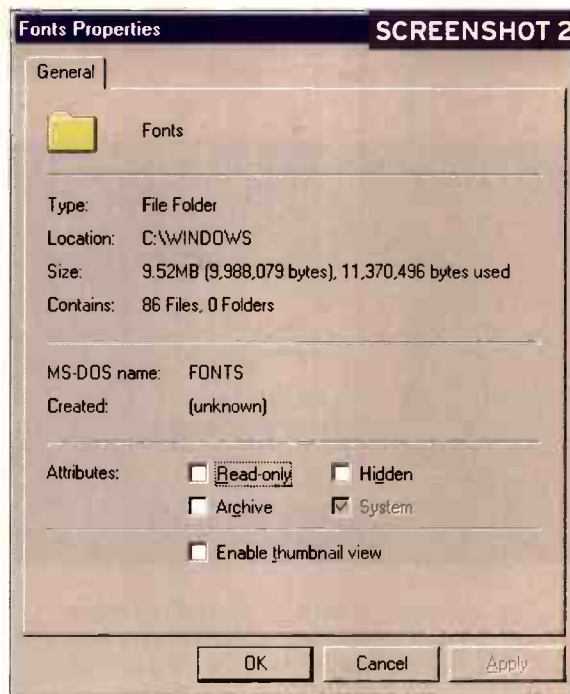


themselves, but serve as 'flags' to the operating system, which can treat them in any way it wants. The hidden attribute, for example, will hide a file from the bare DIR command. It will also hide a file in Windows, unless the option to 'Show hidden files' has been selected. The system attribute, as we saw above, also hides files from the bare Dos command and is used by Windows in a variety of ways including 'magicking' folders such as Fonts or History. The read-only attribute, as the name suggests, stops users from altering a file, but it isn't greatly used by Windows. The archive attribute, as far as I can tell, is not used at all by Windows but, as we will see shortly, can be very useful. File and folder attributes can be accessed in Windows by right-clicking and choosing 'Properties', but you won't be able to alter the System attribute; depending on the Windows version it will be either greyed out or missing (see screenshot 2).

You can delete files with DEL filename and, although it doesn't appear to be documented, DEL folder deletes all the files in the named folder. You can delete a folder with RD folder but it must be empty first. MD creates a folder. None of this is particularly exciting, but there are important differences between Dos and Windows deletion. First, Dos has no recycle bin. It is possible to rescue deleted files but it isn't something you'd want to rely on and I'm not going to go into it now. Second, real-mode Dos will let you delete files that Windows won't. While this makes it possible to do some pretty stupid things, it also means – as regular readers may remember – that you can really clear things such as Internet Explorer History. Finally – and this is a general Dos killer feature – you can use wildcards. A question mark can be used to represent any single character in a filename, and an asterisk any group of characters. So, for example, be\*.do? will return beer.doc and benjamin.dot.

Using wildcards means you can perform an action on a group of files: DEL \*.jpg, for example, will delete all and only the jpg files in the current directory. Dos also has a more powerful delete tool: DELTREE folder. This deletes the named folder and all its contents including subfolders and their contents.

COPY, MOVE and REN (rename) do what you would expect – and remember you can find out more about any command with the /? switch. XCOPY is rather more



SCREENSHOT 2

interesting, especially when you consider how it works with the archive attribute. When you create or alter a file, the archive bit is set (turned on). Normally, in Windows it stays that way forever. However XCOPY with the /M switch makes use of the archive attribute. If a file has its archive bit cleared, then XCOPY ignores it. If the archive bit is set, XCOPY copies the file, then clears the archive bit on the original. If you subsequently edit and save the file, then the archive bit will be set once again.

Add to this the use of wildcards, and the fact that the XCOPY /s switch processes the contents of all subfolders, and you have an elegant backup tool. Let's say you have a target backup folder in D:\backup, and you want to make backup copies of all the .doc files in 'My Documents' and its subfolders. Once you are in the 'My Documents' folder, type: XCOPY \*.doc d:\backup /s /m (see screenshot 3).

The first time you do this, assuming all the files have the archive attribute set, it will copy all the .doc files in My Documents and its subfolders, creating copies of those subfolders on the fly. The next time you type the command, it will copy only files that have had the archive bit set since the last time – that is, files that have changed and new files.

Another handy tip is redirection. You can often issue a command, for example, DIR, that produces more information than the screen can show, and all but the last screenful whizzes off to oblivion. Though there

**You can't change the system attribute from Windows**

are various ways around this, such as using DIR with the /P switch to pause between screens, a neat trick is to redirect the output to a file. If you type DIR > list.txt then you'll get the results saved to a file rather than displayed on screen.

There's much more that you can do with Dos, and we'll take a look at some other tricks another time – look forward to customising Windows folder icons, automating processes with batch files and plumbing the mysteries of PIF files.

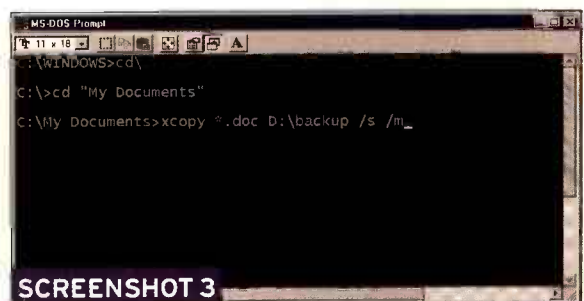
## More Registry...

Last month we looked at the basics of the Windows Registry – what it does, where it's kept, how to back it up and how to edit it. This month we'll consider one or two of the finer points.

You'll find that many of the keys in HKEY\_LOCAL\_MACHINE are duplicated in HKEY\_CURRENT\_USER. Where this happens the value in the latter overrides that in the former. There are two points here – the first is that this isn't really important on single-user machines as HKEY\_CURRENT\_USER is always the same. The other is that even on a single-user machine, you should always look in both locations if you are trying to hunt down an elusive setting. Remember, too, that the settings are cumulative; for example, start-up programs can be loaded from both HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Run and the corresponding HKEY\_LOCAL\_MACHINE\... key. Another aid to the Registry sleuth is the Find command, situated in the Edit menu. You can search in Key names, Value names or data – ie the contents of a value – and narrow things down by searching for 'whole string only' so that a search for 'paint' for instance, won't find 'mspaint' or 'paintbrush'. As per Windows' usual behaviour, F3 finds the next occurrence of a search string.

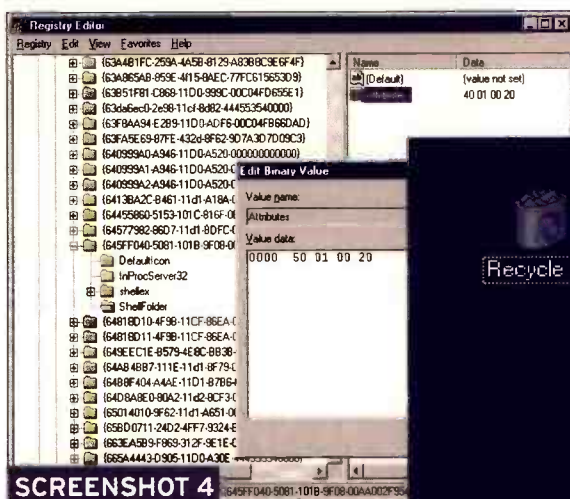
So, after all that hard work, let's flex our muscles with a couple of cool Registry hacks. In Windows 98 and later, you can right-click in a Start Menu subfolder and choose 'Sort by

**Selective backup – free and easy**



SCREENSHOT 3

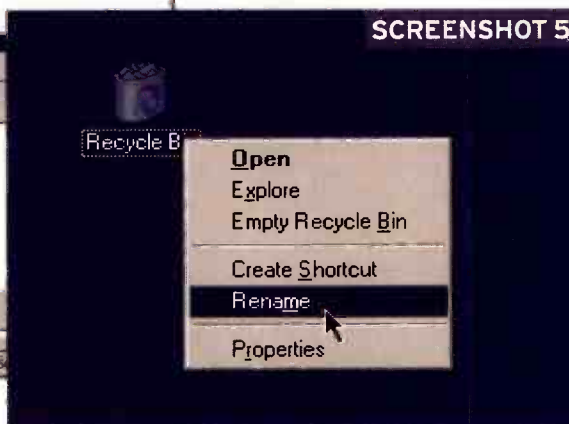




name'. All the entries in that menu level will then arrange themselves neatly into alphabetical order, with subfolders at the top. This is useful if you are a tidy sort of person, but it's fiddly and doesn't 'drill down' – you have to do this for every single subfolder to get them all in alphabetical order. So here's the ultimate in Start menu tweaks for control freaks. Having taken one of the various backup precautions described last month this is what you do. Run Regedit and go to HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Explorer\MenuOrder\Start Menu. Delete the 'Start Menu' key, close Regedit, and restart the PC. Everything in Start, Programs and its branches will be in alphabetical order. You'll probably notice that at the same level as the Start Menu key is a Favorites key and, as you may have already guessed, deleting this will sort the Favorites folder and its subfolders alphabetically.

Last month, we described the class identifiers (CLSID) keys under HKEY\_CLASSES\_ROOT as having 'no user-serviceable parts inside'. This isn't strictly true, as you can modify values here to change the behaviour of some of Windows' key elements. To take an example, the annoying and inaccurately named Recycle Bin. You can rename this from Tweak UI or, indeed, by hacking the Registry directly. What is cooler, however, is to add 'Rename' to the list of actions available on the right-click menu. Once again, take the usual precautions and go to HKEY\_CLASSES\_ROOT\CLSID\{645FF040-5081-101B-9F08-00AA002F954E}. This is the class identity of the Recycle Bin. Open the ShellFolder subkey and double-click on the Attributes binary value within. Change this from 40 01 00 20

Left: Change the Attributes binary value and you can then rename the Recycle Bin (below)



to 50 01 00 20. Close the Registry editor and you'll find you can rename the Recycle Bin just like a normal file (see screenshot 5).

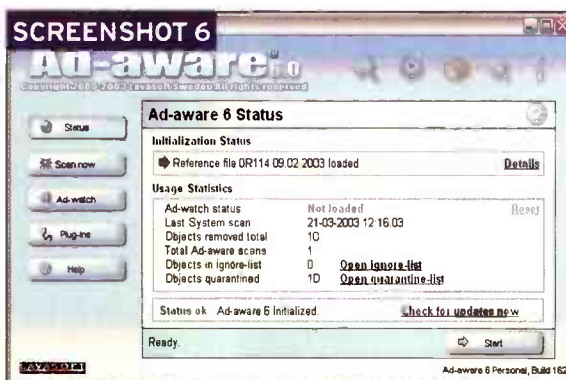
## Your feedback

Further to April's tip on viewing Internet Explorer in full-screen 'kiosk' mode, Mike Cotton points out that you can achieve the same result as Control & Maximise by pressing F11. This works as a toggle so you

## Here's the ultimate in Start menu tweaks for control freaks

can go back to a standard window by pressing F11 again. Howard Millman adds to this that you can get an even more 'unplugged' view by right-clicking on the remaining toolbar and selecting 'Autohide'. If you want an even less cluttered look, run Internet Explorer with the -k switch and a URL, for example `iexplore -k www.pcw.co.uk`. This will remove all toolbars apart from the scroll bar. If you are then left wondering how to close IE, Alt & F4 will do the trick, as with any window.

Weed out spyware with Ad-aware



In recent months, the Hands on Windows mailbox top FAQ has been the refusal by Outlook Express to open certain attachments, narrowly beating 'I have been told to delete jdbmgr.exe as it is a virus – is this a hoax?' (Yes – search Google). We've covered this several times but for those who missed it, it's a security feature of OE6 and you can disable it (at your own risk) from Tools, Options, Security, by unticking the 'Do not allow attachments... that could potentially be a virus'. If you want to get at an individual attachment while leaving the protection in place, click on the 'Forward' button. In the new mail window that appears you will be able to open the attachment by double-clicking on it in the 'Attach:' field.

So, when Peter Hickling asked if I knew why Word attachments to Outlook mail were not being read by colleagues with Outlook Express, I trotted out the usual suspect. However, in this case the usual suspect had an cast-iron alibi. Peter eventually solved the problem and was kind enough to pass on the answer. It appears that Outlook Express does not understand the TNEF format for attachments. Since TNEF stands for Transport Neutral Encapsulation Format one wonders at its neutrality, but there's a full explanation on the Microsoft Support Knowledgebase in article 197066. The answer is to use plain text or HTML to send messages with attachments destined for Outlook Express recipients. You can set this as a global preference from Tools, Options, Mail Format; for individual recipients by choosing 'Send using plain text' in the email section of their Contacts record; and on a per-message basis from the Format menu of the new message window.

Finally, thanks to Vivian Dunn who reports that there is a new version of Ad-aware available (see screenshot 6). There are three versions, depending on the size of your organisation, but the basic, single-user version is free. Ad-aware is the people's champion against spyware, detecting software and cookies on your system that can be used to track your surfing and shopping habits or applications that, for example, hijack your browser home page. You can find it at [www.javasoft.de](http://www.javasoft.de).

## CONTACTS

Tim Nott welcomes your comments on the Windows column. Email him at: [win@pcw.co.uk](mailto:win@pcw.co.uk). Please do not send unsolicited file attachments.



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Epson C70/80 (JT032/40/C24/M34/Y44)	£14 £7
Color Copy Paper (Laser)	A4 A3 A2+
Brilliant White Gloss (127gsm) 50's	£20 £34
Diamond White Matt (110gsm) 50's	£10 £14
Diamond White Matt (110gsm) 20's	£11 £17
Brilliant White Satin (100gsm) 20's	£11
Color Copy Paper (Laser)	A4 A3 A2+
Ultra Smooth (100gsm) 500's	£12 £24
Ultra Smooth (120gsm) 500's	£15 £29
Ultra Smooth (160gsm) 250's	£19 £22
Ultra Smooth (200gsm) 250's	£22 £24
Ultra Smooth (200gsm) 200's	£18 £24

## TONERS CM K TONERS DRUMS PHOTOCONDUCTOR / FUSER / TONER / DRUM

TONERS CM K TONERS DRUMS PHOTOCONDUCTOR / FUSER / TONER / DRUM	TONER / DRUM
Apple LaserWriter Select 300/310/360	(1960) £65
Apple LaserWriter II	(6002) £60
Apple Personal LaserWriter LS/NTR	(0089) £67
Apple Personal LW 300/320/4-600	(2045) £56
Apple LaserWriter 12/640PS	(4683) £85
Apple LaserWriter Pro 16/600/630/800(2473)	£65
Apple LaserWriter Pro 810	(3602) £259
Apple LaserWriter 8500	(5893) £165
Apple Color LaserWriter 12/600PS (3756/7)	£94 £84
Brother HL730/760/FAX-8/9000 (TNDR200)	£17 £99
Brother HL820/1051/1060 (TNDR300)	£17 £99
Brother HL1240/50/70 Hi-Res (TN6600/DR6000)	£49 £99
Brother HL2400 Colour Laser (TN01-BK)	£94 £78
Canon CLBP 360 PS Colour Laser (EPH-BK)	£69 £78
Epson EPL-5500W	(S050005/51029) £45 £55
Epson EPL-5700/5800	(S050010/51055) £49 £55
Epson AcuLaser C112000 (S0033/34Y/35M/36C)	£48 £89
Epson AcuLaser C4000 (S0091/88Y/89M/90C)	£38 £109

## HP & EPSON PRICE BUSTERS SAVE £2 with Black & Colour Sets

HP & EPSON PRICE BUSTERS	SAVE £2 with Black & Colour Sets
EPSON Stylus 440/640/660/670/P750	(20187/191) £29
EPSON Stylus 740/760/860/1160	(20189/191) £30
EPSON Stylus Photo 1270/1290	(T007/T009) £30
EPSON Stylus Photo 2100	(T341/2/3/4/5/6/7/8) £80
HP Deskjet 930/950/970/1220/G55/85/95	(45A/78D) £38
HP Deskjet 920/940/V40/V45/PSC750/950	(15D/78D) £38
HP Deskjet 610/612/640	(14D/49A) £36

## Epson Inkjet Cartridges

Epson Inkjet Cartridges	Black Colour
Stylus 400/600	(093/089) £15 £16
Stylus 800/850/1520	(108/089) £16 £16
Stylus 440/640/660/670	(187/191) £15 £16
Stylus 740/760/860/1160	(189/191) £16 £16
Stylus 480/580/C20/C40	(T013/T014) £11 £14
Stylus 680	(T017/T018) £20 £17
Stylus 880	(T019/T020) £20 £17
Stylus 900/980	(T003/T005) £20 £24
Stylus Scan 2000/2500	(189/191) £16 £16
Stylus Photo 750	(187/193) £15 £13
Stylus Photo 1200	(187/193) £15 £17
Stylus P 790/870/890/915	(T007/T009) £15 £12
Stylus Photo 1270/1290	(T007/T009) £15 £17
Stylus Photo 810/830/925	(T026/T027) £19 £17
Stylus Photo 950	(T31/2/3/4/5/6) £10 £10
Stylus Photo 2100	(T341/3/4/5/6/7/8) £11 £11
Stylus Photo 2000P	(T015/T016) £21 £24
Stylus C42	(T036/T037) £12 £16
Stylus C60/C61	(T028/T029) £22 £18
Stylus C62/CX3200	(T040/T041) £22 £18
Stylus C70/80	(T321/C322/M323/Y324) £23 £11
Stylus C82	(T321/C422/M423/Y424) £23 £11
Stylus 3000	(118B/130C/126M/122Y) £38 £38
Stylus Pro5000 (118B/147C/143M/122Y)	£38 £38
Stylus Pro5500 (T486/487Y/488M/489C)	£49 £49
Stylus Pro7000 (All 6 Cols - Price Each)	£31 £31
Stylus Pro7500 (All 6 Cols - Price Each)	£38 £38
Stylus Pro9000 (All 6 Cols - Price Each)	£47 £47
Stylus Pro9500 (All 6 Cols - Price Each)	£60 £60

## Epson Stylus Paper Media

Epson Stylus Paper Media	Black Colour
Premium Glossy Photo Roll 100mm (41303) 1x8m	£13
Premium Semi-Gloss Roll 100mm (41330) 1x8m	£10
Premium Glossy PhotoRoll 210mm (41377) 1x10m	£30
Premium Semi-Gloss Roll 210mm (41336) 1x10m	£32
Premium Glossy PhotoRoll 320mm (41379) 1x10m	£42
Premium Semi-Gloss Roll 320mm (41338) 1x10m	£44

## Other Inkjet Supplies

Other Inkjet Supplies	Black Colour
Apple/Lexmark/Olivetti/Xerox	Black Colour
Apple S/Writer II/1200	(8041) £15
Apple S/Writer 1500	(8041/4609) £15 £19
Apple S/Writer 2200	(3308/3309) £27 £29
Apple S/Writer 2400/2500 (2400/3328)	£28 £32
Apple S/Writer 24/2500Tanks (3330/29)	£5 £12
Lexmark 150/1000/2000 (13400/13619)	£20 £24
Lexmark 32/50/7000/211 (A1970/1980)	£20 £24
Lexmark Z42/43/Z51/52/A1970/M0120	£20 £26
Lexmark Z12/Z22/Z32 (17G005/060)	£21 £21
Lexmark Z13/Z33/Z35/35/35/10N0016/26	£21 £23
Lexmark Z55/Z65/Z65N (18L0032/42)	£22 £26
Olivetti JP150/170/350 Head + 4 Refills	£38
Olivetti JP170/190/360/450 Mono/Col	£20 £30
Xerox C6/C8/4C/6C/450C (7880/7867)	£9 £9
Xerox JX8C/MC/470/480X (7881/7880)	£30 £28

## QMS Toner Kits

QMS Toner Kits	Toner Kits - All 4 Toners
QMS MagicColor 2	£325
QMS MagicColor 330	£315
QMS MagicColor 2200/2210	£265
QMS MagicColor 3100	£285
QMS MagicColor 6100/6110	£495

## TONERS

TONERS	BLK, C, M, Y
QMS MagicColor 2	(04B/03C/02M/01Y) £89 £89
QMS MagicColor 330	(01B/02C/04M/03Y) £39 £39
QMS MagicColor 2200	(01B/04C/03M/02Y) £42 £75
QMS MagicColor 3100	(01B/02C/03M/01Y) £32 £89
QMS MagicColor 6100	(01B/02C/03M/01Y) £105 £135
Samsung ML1210/1220/1500 (ML1210)	£39
Samsung ML1510/1710/1750 (ML1710)	£49
Samsung ML1650/1651 (ML1650)	£79
Samsung ML2150/2151N/2152W (ML2150)	£75
Samsung ML4500/ML4600 (ML4500)	£49
Samsung ML6040/6060 (ML6060)	£65

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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

# Keeping secrets

We explain how to keep files private and customise some icons on a multi-user PC

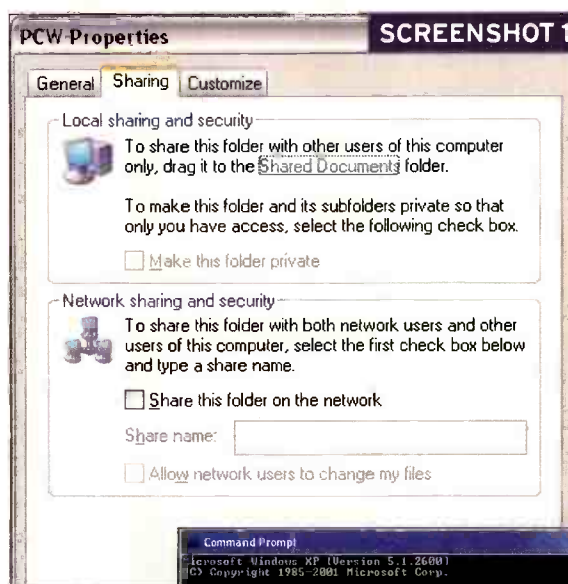
Last month we looked at a crafty way of restricting users in XP Pro while keeping the administrator unfettered, and I promised that this month we'd look at ways of doing the same for XP Home users. This, I regret to say, is still under construction, so instead we'll look at a related security issue on multi-user XP Home PCs. How can individual users keep their own files private?

If you open My Computer, you'll see a documents folder for each user, plus a shared documents folder. Right-click on your documents folder and under Sharing and security, or Properties and the Sharing tab, is an option to 'Make this folder private'. Tick this, and no other user will be able to open the folder. This isn't much of a safeguard if you don't log on with a password, so if you have a blank password, Windows will remind you of this and give you the opportunity to set a proper one.

You may find that the 'Make this folder private' option is greyed out (see screenshot 1). There are several reasons for this. First, you may not have the right to make a folder private: this right only extends to your own documents folder and subfolders and folders in your profile, such as your Desktop, Favourites and other personal folders stored in C:\Documents and Settings\yourname. Second, if the option is ticked, but greyed out, the folder has inherited its privacy from a containing folder – you can't make C:\Documents and Settings\yourname private and share C:\Documents and Settings\yourname\Desktop, for example.

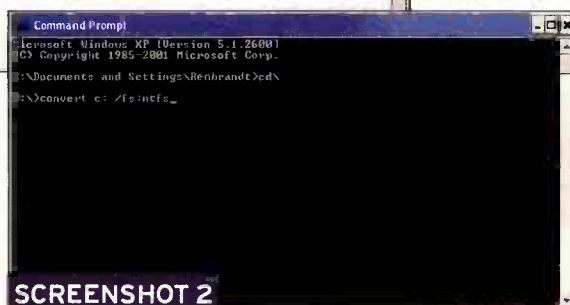
Finally, you can only make a folder private if it is stored on an NTFS partition. If you've upgraded from Windows 98 or ME, or if your supplier has formatted your partitions as Fat 32, you need to convert the partition(s). This isn't difficult and is non-destructive of data, though, as with any other disk-level undertaking, you would be foolish not back up your data first.

Converting to NTFS is one-way – you can't get back to Fat 32 without reformatting the partition or using third-party software. If you are dual-booting with Windows 98 or ME, then neither of those will be able to read data on the XP NTFS partition.

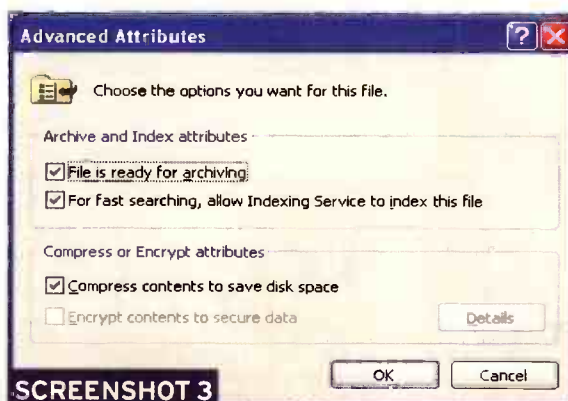


Above: If privacy is greyed out, you could have the wrong file system

Right  
Converting a  
Fat 32 partition  
to NTFS



Below: Saving  
disk space through  
compression



Apart from the privacy issues there are several more pros for NTFS. One is really big files. Fat 32 will only handle files up to 4GB. So if you are planning to store full-size video files, for example, you may find this restrictive. NTFS has no such limit. Under XP Fat 32 partitions are limited to 32GB, though this latter limit doesn't apply to ME or 98. NTFS is also a 'journalled' file system. Without going into the details, it means your data is far less volatile – in the event of a crash you should be able to get at your recovered files immediately, without having to run the disk checker. XP Pro users have a further raft of technologies available,

with file encryption and network user management via Active Directory.

Ideally you should create NTFS partitions when you install XP, or by formatting existing partitions, but the latter will destroy all data. The non-destructive conversion process creates smaller

cluster sizes than a straight format, which can impair performance. Another downside to NTFS is that it allocates more disk space to file records, and less to files, but the increase in reliability and efficiency more than offsets these drawbacks.

To convert a partition, close down all other applications and open a command prompt. Type `convert x: /fs:ntfs` replacing x with the letter of the partition you want to convert (see screenshot 2). You may get error messages saying that the drive needs to be unmounted or that Convert cannot gain exclusive access to the drive. In this case, the drive will be converted at the next restart, so go with the flow and follow the prompts. You did make that backup, didn't you?

When you've converted the partition, you should then be able to use the privacy settings as described above. Each user has to do this for themselves: administrators, restricted users and even the guest account can all have 'privatised' folders, though since the last can't have a password there is little point.

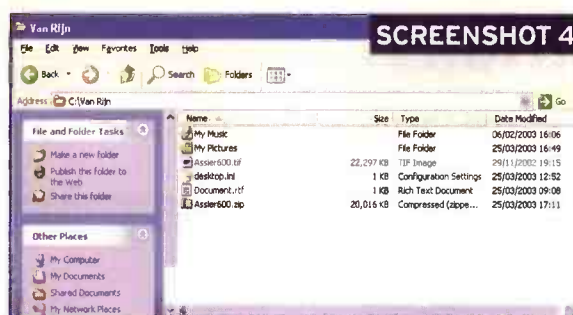


Although XP Home doesn't support the NTFS file encryption, it does support compression. If you right-click and go to a file's properties, you'll see an Advanced button. Click on this and you'll get a new dialogue with the option to Compress contents to save disk space (see screenshot 3). Compressed files show in blue in file listings.

This brings us neatly to the subject of compressed folders. This facility is open to all XP users, irrespective of file system. If you right-click on a file or a selected bunch of files, you can 'Send to' a compressed folder. This will take the name of the file under the cursor at the moment of sending to and be placed in the same folder. You need to be aware of two things here. After limited experimentation, this seems to achieve a better compression ratio than the NTFS compression (see screenshot 4). And, as I've mentioned before, you can add a password to a compressed folder – which is actually a plain old zip file – by double-clicking on it to open the folder, then going to its File menu and choosing Add a password. Hence, even with Fat 32, you can prevent other users of the PC from having access to sensitive files. Note that the Send to feature copies, rather than moves, so you'll need to delete the originals of your top-secret files, and empty the recycle bin. And in case you are wondering about the name of the file in screenshot 4, Assier is the name of a French town.

## Don't be a duck

While we're on the subject of users, you've no doubt been impressed that each user can have their own picture in the logon screen and at the top of the Start Menu. You can change this from Control Panel, User Accounts, and if you have administrator status you can change other users' pictures, too, which is a handy way of annoying them. If you feel that you deserve better than being represented by a rubber duck or a drip, then you are free to browse to other images. A neater way is to give yourself – and your users – a wider choice of pictures from the outset. First catch your pictures. The standard images supplied are 48 pixel square .bmp files, but you can use other formats such as .jpg and, though there is nothing to be gained in using larger files, they will be scaled down to suit. Copy your custom images to C:\Documents and Settings\All Users\Application Data\Microsoft\User Account Pictures\Default Pictures, and you'll be able to see them in the company of the standard choices (see screenshot 5).



If you like that sort of thing, you can customise the icons for your folders, as well as the image shown on the folder in thumbnail or filmstrip view. Right-click on a folder, choose Properties then turn to the Customize tab. If you click on Choose picture you'll be offered a choice of the image files in that folder, but you are at liberty to browse elsewhere (see screenshot 6). If you click on Change icon you will be offered the run of the icons in the System32.dll file. If nothing here catches your fancy, browse elsewhere – Pifmgr.dll has long been a source of interesting icons, including some sticks of dynamite and a tuba. Again, you don't have to use a ready-made icon. If you select All files in the Files of type box in the Browse dialogue, you'll be able to select any image – Windows will resize it to suit.

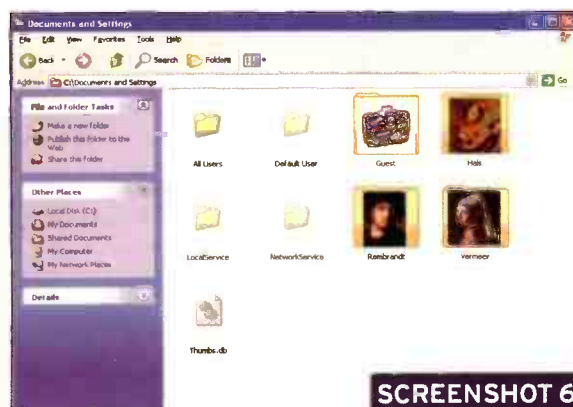
## Cake and eat it

I am indebted to Neil Brooks for pointing out that my reply to Antonis Papanestis in April's Question time was incorrect. To recap, Antonis

**Top: You can password-protect zip folders**

**Bottom: Add your own images to the user pictures**

**Customise those folder thumbnails**



wanted to use Outlook as his default email program, while his wife wanted to use Outlook Express, and they both had separate user identities set up on the PC. When either of them logged in and started up their chosen mail program, a message would flash up stating that this wasn't the default mail program and would they like it to be? And so on, in an endless game of email client ping-pong.

I replied that you couldn't do much about this as the setting is in the HKEY\_LOCAL\_MACHINE section of the Registry, where one size fits all. Neil correctly points out that a key stored in the HKEY\_CURRENT\_USER section will override this, even though Microsoft has not seen fit to provide an interface for setting this.

The solution involves some careful Registry editing, so do create a Restore Point first. It doesn't matter who starts, but let us assume she has logged on and set her default mail client. She then opens the Registry Editor, and goes to HKEY\_LOCAL\_MACHINE\SOFTWARE\Classes\mailto, where she right-clicks and exports the branch to a reg file. She closes the Registry Editor, right-clicks on the reg file and chooses Edit. She should see something like this:

Windows Registry Editor  
Version 5.00

```
[HKEY_LOCAL_MACHINE\SOFTWARE\Classes\mailto]
"EditFlags"=hex:02,00,00,00
"URL Protocol"=""
```

(Key: ✓ code string continues)

followed by more entries headed by HKEY\_LOCAL\_MACHINE\... in square brackets. She replaces all the occurrences of HKEY\_LOCAL\_MACHINE with HKEY\_CURRENT\_USER, taking care that the file is otherwise exactly the same, then saves the file and logs off. The other user logs on, and sets his own choice of email program. This will now be the one stored in HKEY\_LOCAL\_MACHINE. He can now log off. She can then log back on and double-click on the edited reg file to merge it into the Registry. This will then store her preference in the HKEY\_CURRENT\_USER section, where it will override (but not overwrite) the one stored in HKEY\_LOCAL\_MACHINE when she is logged on.

## CONTACTS

Tim Nott welcomes your comments on the Windows XP column. Email him at: [xp@pcw.co.uk](mailto: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

# Critical conditions

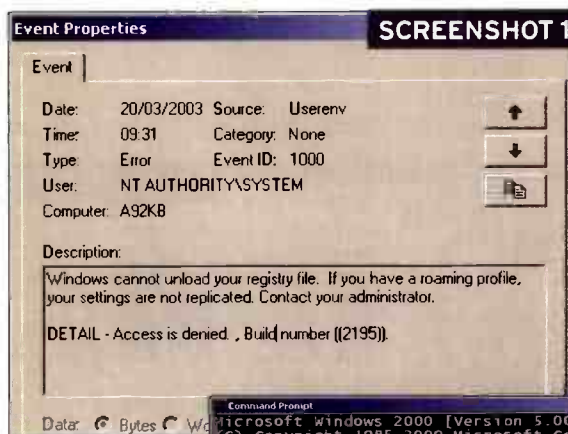
How to get Windows updates and security bulletins to work with, not against, you

**T**his month's topic is 'Fun with Windows Update', an online service which installs critical security fixes, but has been acting up for quite some time now. To add to the woe, Microsoft added a few hastily produced bug fixes that in some cases triggered a denial of service as Windows 2000 failed to restart after the fix had been applied. But first, the article at <http://support.microsoft.com/default.aspx?id=319652> has critical information – if you receive what purports to be a Microsoft patch as an email attachment, it isn't from Microsoft, it's a virus, trojan or worm in disguise. Microsoft never emails security patches.

Readers Peter Baker and Jim wrote to say that Windows shutdown had suddenly started taking far longer to complete. The problem was caused by a critical update, MS02-070: Flaw in SMB Signing May Permit Group Policy to Be Modified, which is referenced in Knowledgebase article 329170 at <http://support.microsoft.com/?id=329170>. This flawed critical update causes the Spooler service to open some keys in the Current User section of the Windows Registry – HKEY\_CURRENT\_USER. When the user logs off, these keys aren't closed and this delays the shutdown process while it attempts to save a backup of the Registry. It's not a show stopper, but it can easily be fixed.

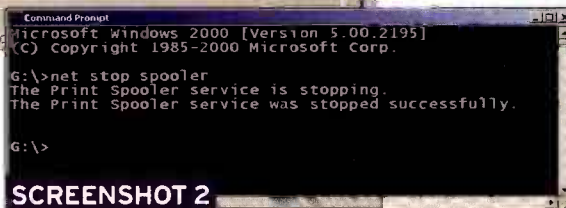
If this problem affects you, the Event Viewer (Control Panel/Administrative Tools/Event Viewer) should list one or more Errors (red ball enclosing a white 'X') with a Source of 'Userenv' and an Event ID 1000 (see screenshot 1). Double-clicking on this entry to display its properties shows the description, 'Windows cannot unload your registry file. If you have a roaming profile, your settings are not replicated. Contact your administrator. DETAIL - Access is denied, Build number ([2195])'.

Other unrelated problems can also trigger this Event ID so its presence is not definitive. Open Control Panel/Add/Remove Programs and look for an entry as follows: 'Windows 2000 Hotfix (Pre-SP4) Q329170. If this entry is present you can either remove it now or confirm the diagnosis by stopping the Spooler



**Above: Critical update triggers extended shutdown delays**

**Right: Closing down the Spooler service to diagnose a shutdown delay problem**



**SCREENSHOT 2**

service and restarting Windows 2000'. To stop the Spooler service, open a command prompt window (Start/Programs/Accessories/Command Prompt). If you're not logged on as a user with administrative rights, you can open the Command Prompt window with administrator rights by means of the RunAs option. Hold down the Shift key, right-click on the Command Prompt menu item, click on RunAs, and enter an administrator password.

At the command prompt type: `net stop spooler` (see screenshot 2). Restart Windows 2000 when you see confirmation that the Spooler service has stopped. If the extended shutdown delay goes away, the diagnosis is definitive and you can fix the problem permanently by using Add/Remove Programs to remove the Q329170 Hotfix. More information can be found at: <http://support.microsoft.com/default.aspx?id=814770>.

## Critical conditions

This begs the question as to whether it is sensible to remove patches that Microsoft has listed as critical updates, and here's where it gets interesting. Despite their appearance in your browser window when you visit Windows Update, critical updates aren't always critical. They may only be critical to a specific section of the audience. As we've said before, the critical update system is a blunt weapon that can produce

unintended results when critical updates contain flaws, introduce new bugs or interact in unexpected and untested ways with the operating system and hardware.

The Automatic Update service introduced in Service Pack 3 simply automates this process. Given that over 70 updates, (not all applicable to Windows 2000), were released in 2002, the odds in favour of one or more going awry are high – two out of eight already have in 2003. This makes it all the more important to

manage the critical update process. But even this is not as easy as it should be.

If you signed up for the email security alerts, and have received

them since December 2002, you'll have received at least two emails containing a summary of the text of the Q329170 bulletin published at [www.microsoft.com/technet/security/bulletin/MS02-070.asp](http://www.microsoft.com/technet/security/bulletin/MS02-070.asp). The second release of the bulletin corrects an error in the first bulletin which says that Windows XP Service Pack 1 is unaffected by this vulnerability. That aside, if you read the email or if you link to the fuller online description (as we strongly recommend), it's really hard, even for technically proficient users, to determine whether they need to install this Critical Update.

In fact, most users don't need to install Q329170 at all. The vulnerability it addresses is present by default in all Windows 2000 installations. It is not a major cause of concern for home users or people using desktops on corporate networks. The only people who need to install Q329170 are network administrators who have specifically taken action to increase the security of networked Windows 2000 (and XP) computers by changing some specific options.

In a nutshell, if you weren't aware of the SMB signing service before reading this critical update, it couldn't be classed as one. This isn't to say that on balance you should reject critical updates. You just need to be very careful about applying them. In this case the problem the critical update causes when applied unnecessarily is an annoyance rather

than a disaster. But, as the other flawed update discussed below demonstrates, it can get worse.

But before we do that, how do you decide whether to apply a critical update if the only way to determine its necessity is by reading and deciphering documentation that can be very technical, often obtuse, and sometimes incorrect – as the second release of the Q329170 bulletin demonstrates? One way would be to install everything and then touch wood. This might work for some, and you won't have to read all those bulletins, but you could be unlucky and, if you only have one computer, have to spend a day or more discovering and recovering. It would therefore be wise to have a reliable and frequently tested backup strategy.

The hard truth is that if you want to reduce risks you have to invest time and effort. Sign up for the email alerts and read the bulletins. Don't automatically download and install critical updates. When you visit the Windows Update website and see critical updates listed, don't download them before following the associated 'read more' links, and try to determine whether the critical update applies to your situation.

Finally, read the Windows Update newsgroup news://microsoft.public.windowsupdate, where user problem reports appear soon after new updates are released. And, if you value your data or access to the web, have a disaster recovery strategy ready. You never know when you might need it.

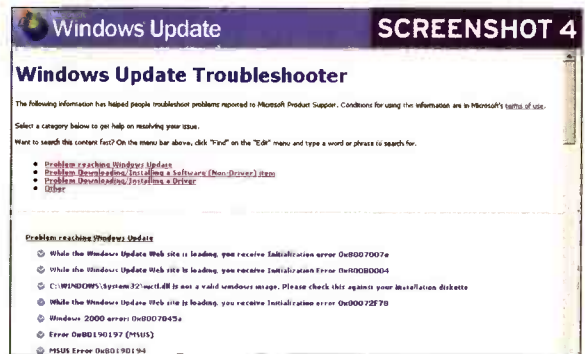
Microsoft is not unaware of the problems non-technical users face when trying to decode security bulletins. A few months ago it launched a new email Security Update service aimed specifically at home users and small businesses. This new service attempts to clarify the decision-making process for non-technical users. For example, in respect of the above-mentioned Q329170 critical update it says: 'An identified security issue in Microsoft Windows 2000 and Windows XP could enable an attacker to modify a network's security policies. Network administrators can help protect their networks by installing this update from Microsoft. This update only affects networks running Windows 2000 or Windows XP. Home users and those using workstations on corporate networks need take no action.' That's admirably direct and to the point. The full bulletin can be found at [www.microsoft.com/security/security\\_bulletins/ms02-070.asp](http://www.microsoft.com/security/security_bulletins/ms02-070.asp) (see screenshot 3).

It's too early to say whether this new service will always be as direct, but it's a good start. Even so, we still recommend doing additional research as discussed above. It may take a while, but the odds are that it will still be less time-consuming than recovering from a flawed update. To request this service, visit the web page at [www.microsoft.com/security/security\\_bulletins/decision.asp](http://www.microsoft.com/security/security_bulletins/decision.asp). Ignore the bump at the top which refers to the web-subscribe service, unless you already have a Microsoft Passport or want to register for one. Instead, scroll down to 'Other ways to subscribe' and click the link or go to <http://register.microsoft.com/subscription/subscribemem.asp?ID=135>. Here you can sign up for security alerts by entering your email address, country and language. If you wish to compare the new simplified service with the original alert service you can sign up for the latter by selecting the link under 'Learn more about the Microsoft Security Notification Service' which refers to the 'more technical version'. Try them both; it's easy to unsubscribe from either later and you won't be inundated with mail, only two a week rather than one, on average.

## DLL hell

The other Critical Update where a bug struck recently is altogether more important. In this case the patch is definitely critical, but under certain circumstances can cause Windows 2000 to fail to reboot. The problem is specific to Windows hotfixes only available directly from Microsoft Product Support Services. These patches were never distributed through Windows Update or public downloads. More details are at <http://support.microsoft.com/default.aspx?ID=815021> and in the full security bulletin which is at [www.microsoft.com/technet/security/bulletin/MS03-007.asp](http://www.microsoft.com/technet/security/bulletin/MS03-007.asp).

The bigger problem with this security bulletin (at the time of



**Windows Update nightmares? Try the new Troubleshooter**

writing) is that it is poorly drafted and gives the impression that the problem is confined to users running Microsoft's IIS web server. The bulletin says: 'The vulnerability results because of an unchecked buffer in a component of Windows, Ntdll.dll that can be called using Webdav' and goes on to describe the problem entirely in the context of an exploit against Webdav. In fact, NTDLL.DLL sits at the very core of Windows 2000 and has access to every part of the system. Webdav is only one of many ways of exploiting the compromised NTDLL.DLL – the patch is as critical as it gets because other exploits have already been described, but you wouldn't know this from Microsoft's March security bulletin.

Putting all the above together, it's obvious that applying critical updates is a risky business, that automating updates assumes an update quality that Microsoft has failed to deliver, and that security bulletins not only need to be read carefully, but must also be backed up by further reading.

Finally, as if this wasn't enough, Windows Update remains a source of frustration for those who cannot access it, get stuck scanning for updates once they've accessed it or find updates refusing to be downloaded or installed. One way around this is to download manually from the 'Read more' links provided in the Update descriptions, but there's another quirk that causes Windows Update to continually insist you need updates which you know you have already installed. If you're having this kind of fun, you'll be pleased to know that the old Windows Update FAQ has grown into an extensive list of problems and possible solutions at <http://v4.windowsupdate.microsoft.com/troubleshoot> (see screenshot 4).

## CONTACTS

Terence Green welcomes your comments on the Windows 2000 column. Email him at: [win2000@pcw.co.uk](mailto:win2000@pcw.co.uk). Please do not send unsolicited file attachments.



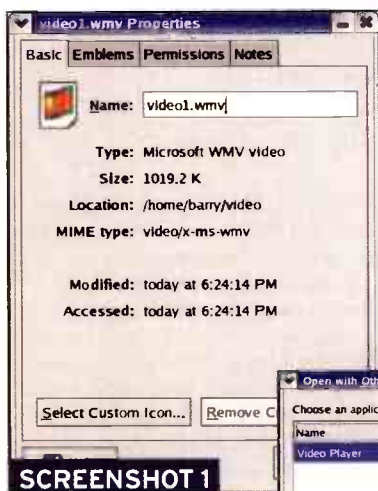


**Barry Shilliday**

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

# Introducing Xine to Nautilus

We guide you through setting up your system to load video file formats in Nautilus

**SCREENSHOT 1**

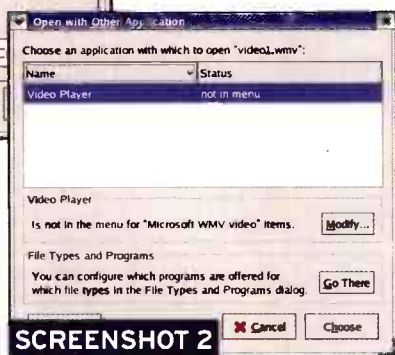
Last month we began the task of getting the right application running after double-clicking an icon in KDE and Gnome's file browsers. KDE's Konqueror is not over-complicated – the .desktop files used to associate programs with file types are also used to add entries to the menus. Gnome, however, separates its menu system from Nautilus' own. The KDE section last month showed how the configuration for Gnome's file browser is similar in concept.

So far we've added the Xine media player ([www.xinehq.de](http://www.xinehq.de)) to the KDE and Gnome menus, and various video file formats are now set to load up the player in Konqueror. This month we'll do the same in Nautilus.

## Mime types again

Just like Konqueror, Nautilus works with Mime types. Typical types are image/jpeg and audio/x-mp3, thus they are divided into family groups and members. The system can automatically determine the type, using the magic number we saw last

Finding a file's type is easy, just look at the properties

**SCREENSHOT 2**

Xine's not yet in the menu, but the player has registered this Mime type

month, or by the file extension.

Either way, you can see the assigned Mime type by right-clicking on a file in Nautilus and examining the properties (see screenshot 1).

The Gnome developers have not been idle, nor have they been remiss in their base configuration of Nautilus. While many of the applications to view or edit files are not part of Gnome, the Mime types of all common formats are set up ready for use. The types that we're

interested in with Xine are naturally part of the video family; and those for mpeg, avi, Real Player, Microsoft Video and others are defined.

That's why, in the previous example, Nautilus correctly identified a Microsoft wmv file even though it has no knowledge of applications that can do anything with it. The file with the information about typical Mime types is /usr/share/mime-info/gnome-vfs.mime. In here you will see

myriad types; but we're not going to mess around with it, since all the types Xine needs are already there.

To introduce Xine to Nautilus' world you first have to register the application. Nautilus has a text-based database of applications, referenced by simple names. The concept is similar to the .desktop files we've seen before. An application needs several fields: a name that appears on the menu, a line to tell Nautilus how to execute the application, and others such as whether to open a shell terminal to launch the app, and whether it can take multiple files at once. The format for our Xine example is shown in figure 1.

The database file is at /usr/share/application-registry/gnome-vfs.

applications, where you'll find loads of entries similar to the one we're using for Xine. There are other possible fields, such as 'can\_open\_multiple\_files', but just take the defaults in the example.

You can add the Xine entry to this database file or create a new file in the same directory. Save the code in figure 1 to /usr/share/application-registry/xine.applications.

Nautilus is now aware of Xine as an application and that it can deal with the Mime types given. The name on the menu will be Video Player, but internally the application details are referred to by the keyword xine.

Right-click on a video file of the types listed and select Other Application from the menu. The window shown in screenshot 2 appears. Nautilus realises that Xine can open files of this type, but it's not configured in the menu (hence we have to select other application). By clicking Choose, Xine opens the file. This is usable, but not ideal. We can't double-click on the video file, nor can we select it from the right-click menu. That's the next step.

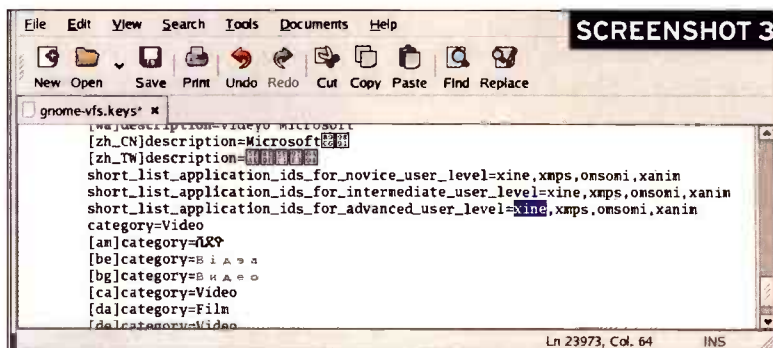
To complete the process, Nautilus must associate Mime types directly with applications by adding them to the menu. Even though, from the application files alone, Nautilus knows that Xine can open several video types, we do this so we can create a limited list of applications, or have different options for novices or advanced users. For example, the system might have 20 applications registered that can open a jpg file, but a right-click to select an image viewer is unlikely to be useful if all 20 appear. More likely, a few of the most popular choices are shown and, if you want another, you can select Other Applications and find it there.

**FIG 1**

## Step 1 – registering the application

```
xine
command=xine
name=Video Player
requires_terminal=false
mime_types=video/x-msvideo,video/x-ms-wmv,
video/quicktime,video/mpeg
```

(Key: ✓ code string continues)

**SCREENSHOT 3**

One way of adding an application to the right-click menu



SCREENSHOT 4

Xine is added to the menu for various video types

Again, the information is stored in a text database file, `/usr/share/mime-info/gnome-vfs.keys`, which is a large file containing translations for the Mime types in multiple languages, as well as a list of applications for the menu. In screenshot 1 the type is described as 'Microsoft WMV video'. It's this file which translates that to Arabic, French or Russian.

Search through the file for the line 'video/x-msvideo' – the Mime type for Microsoft avi video. Within the entry you'll find three lines referring to `short_list_application_ids`, followed by a list of applications (see screenshot 3). We've added the entry 'xine' to the list for all three user levels. Also here are several other applications, such as `xmms` and `xanim`. These didn't appear on the menu because they aren't installed on the system. The app's registration file tells Nautilus how to execute the application, and if it can't do that, Nautilus ignores it. That's why, in the May issue, when we added Real Player to the system, it magically appeared in the menus; Gnome already had Real Player registered, so as soon as it was installed it was ready to go.

Now, if you change the database file as shown in the screenshot, Xine will show up on the menu as Video Player, but only for avi files. We need to make the same change for all the Mime types that Xine should be responsible for. Making many small changes in such a large file is cumbersome and hard to maintain. If a patch to the system overwrote this standard file, all your changes would be lost. Just like the application Registry files in the first step, you can create an overriding file in the same directory. So don't modify the file in the first way. Instead enter the directory `/usr/share/mime-info/` and create a file called `xine.keys`, with the details shown in figure 2.

Some overrides are made against the listed Mime types. The `default_action_type` line tells Nautilus that double-clicking on the icon opens up an application to do the work, and not an internal viewer. The second line adds our new xine application to the current list. Now, if you bring up the right-click menu against any of these files, the Video Player option appears (see screenshot 4). If there are no other entries in the menu, Nautilus will automatically open up the file in Xine when you double-click on a video file. We will see how to set this explicitly later.

There's one more way of making the changes easier. All the Mime types that interest us, as far as Xine is concerned, belong to the video family. Instead of listing each type, we can specify the whole family together. The list is then compacted to one simple entry (see figure 3).

The difference here is that Xine now appears on the menu for all the video file formats, whether it can open them or not. That might not be what you want, but it makes the configuration far simpler.

So, to summarise, the steps are:

1. Create a new application definition in `/usr/share/application-registry/` with a filename ending in `.applications`.
2. Create a new `.keys` file in `/usr/share/mime-info/` to add the new app to any required mime types.

If all this seems like too much work, don't worry. As we said at the start, most file types are configured already, and lots of the most common applications are registered and set up to load from the menu. These include image, sound and text files, pdf, Postscript and many others.

What about configuring a new type? Last month we introduced a new kind of text file, with the `.pcw` extension. Although suspiciously similar to plain text, these files contain information for which we coincidentally need a Mime type of their own. Getting Nautilus to manage `.pcw` files requires one extra step.

## More Mime

The database of standard Mime types is listed in `/usr/share/mime-info/gnome-vfs.mime`. It's unwise to edit the file directly, so create a new file in that directory, and call it `pcw.mime`. It contains just the lines:

```
text/x-pcw
text: pcw PCW
```

Explanation isn't really necessary, but here the type is defined and associated with the extension in both lower and upper case; Unix is very choosy about case. Next, we need to

FIG 2

## Step 2 – Linking Mime types

```
video/x-msvideo
default_action_type=application
short_list_application_user_additions=xine
```

```
video/x-ms-wmv
default_action_type=application
short_list_application_user_additions=xine
```

```
video/mpeg
default_action_type=application
short_list_application_user_additions=xine
```

```
video/quicktime
default_action_type=application
short_list_application_user_additions=xine
```

FIG 3

## Step 2 alternative

```
video/
default_action_type=application
short_list_application_user_additions=xine
```

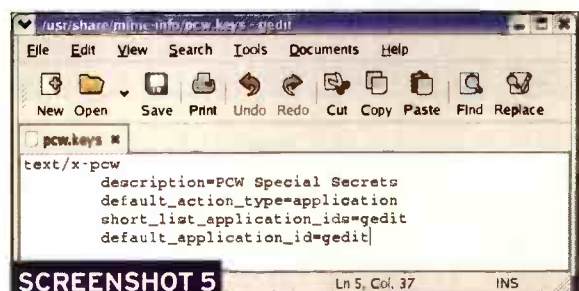
create the associated `.keys` file to contain a description of our new Mime type and a list of applications that appear in the menu, just as we did for Xine. This example differs slightly, as we only give one application for any kind of user, and set the default (double-clicked) application to `gedit` explicitly. See screenshot 5 for the details. Save this file to `/usr/share/mime-info/pcw.keys`.

You are probably wondering what happened to the application Registry file, as we haven't added the new type to `gedit`'s list. This is because `gedit` is already set to open all of the 'text/' family, something that makes sense for a text editor.

With everything now done, a properties window on a `.pcw` file gives us the window shown in screenshot 6, and double-clicking the file directly loads `gedit`, as expected.

## X Multimedia System

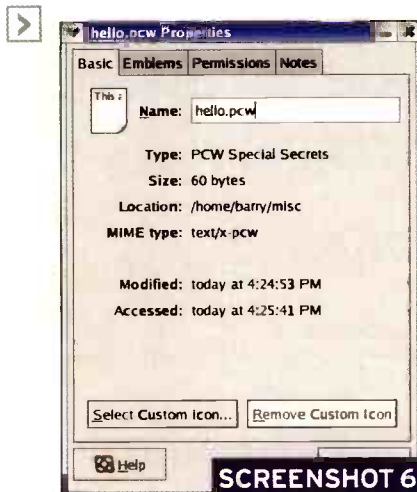
Sticking with multimedia, but shifting from video to audio, we turn to XMMS ([www.xmms.org](http://www.xmms.org)). Xine is capable of playing audio files, but using it to do so would be overkill, not to mention that its interface is really designed for video. XMMS has



SCREENSHOT 5

One of two files needed to register a new type in Nautilus





The .pcw extension, recognised in Nautilus

been around a fair while, and is supplied by all the main Linux distributors. A few months ago in this column, one of the improvements made to a Red Hat system was to add the MP3 plug-in back to XMMS, thus re-enabling support for this audio format. If you missed that, check out <http://staff.xmms.org/priv/redhat8>.

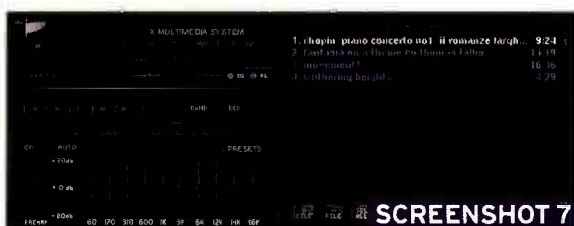
XMMS is a popular choice for audio under Unix. It's similar in style to Winamp ([www.winamp.com](http://www.winamp.com)), the audio player for Windows systems. All the normal audio formats are supported, including Ogg Vorbis, MP3 and wav. The appearance of XMMS is a little plain (see screenshot 7), but we can improve that.

A capability XMMS shares with Winamp is changeable skins; these don't alter the performance or abilities of the player, only the appearance. Some are available at [www.xmms.org/skins.html](http://www.xmms.org/skins.html), and Winamp 2 skins work too. They're installed the same way, which is what we'll look at now.

The system-wide directory for XMMS skins is /usr/share/xmms/Skins. They can be .tar.gz (gzipped tar) format and, if the unzip utility is available, zip format. Any archives put in this directory become available to any user

Top: XMMS' default skin

Bottom: An alternative skin, from [www.xmms.org](http://www.xmms.org)



SCREENSHOT 7



SCREENSHOT 8

on the system. The alternative location is in a home directory, ~/.xmms/Skins, though any skins here are obviously only available for that particular user.

So as an example, take a look at the URL above and download one of the skins – Winamp X (XMMS version) is a good choice. Save the file and, assuming the filename to be 'skin.tar.gz', do the following:

```
$ su
# chmod 644 skin.tar.gz
# cp skin.tar.gz /usr/share/xmms/Skins/
```

(Key: ✓ code string continues)

These commands make sure you have read permissions for the new skin archive and then copy it to the system-wide skin directory. Next load up XMMS and right-click to get to the Skin Browser. Select the new skin and you'll see it change immediately, as seen in screenshot 8. You can install as many skins as you like.

## Skin plug-ins

As you can see from the screenshot, the appearance of XMMS can be altered considerably. That said, it's still clear it is the same application. If you want a more dramatic change, Kjofol skins are the answer. Kjofol is an old Windows MP3 player that allowed complete control over its appearance through the use of skins. XMMS can use these skins indirectly, by way of a visualisation plug-in. This sort of plug-in extends XMMS by giving visual feedback to the audio – normally that means displays of colour or animation, but in this case it's a new GUI.

Mandrake Linux already supplies the Kjofol plug-in, but most other distributions don't go near it ([www.mandrake.com](http://www.mandrake.com)). It's not the most stable piece of software, but it's good if you like to be unusual.

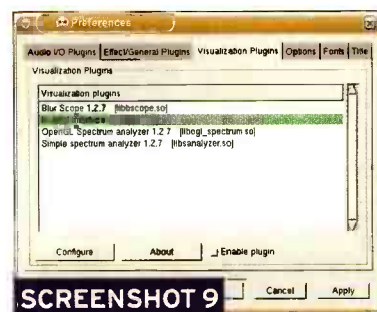
To install the plug-in, first you need to have the development files for XMMS. If you've installed XMMS from source, you have them already. Otherwise, you may need to install them from the distribution CD. In the case of RPM-based systems such as Red Hat and Suse, its name begins with xmms-devel. Red Hat 8 users can go directly to the link above and download the RPM from there, otherwise try [www.xmms.org](http://www.xmms.org). To see if you have the development RPM installed, run the command below.

```
# rpm -qa | grep xmms-devel
```

If there's no output from this query, the RPM's not installed. Install the development RPM as follows:

```
# rpm -Uvh xmms-devel*
```

The Kjofol plug-in for XMMS is at [www.csse.monash.edu.au/~timf/](http://www.csse.monash.edu.au/~timf/)



SCREENSHOT 9

Enable the plug-in through the Visualization tab

**xmms.html.** Download the archive, currently called kint\_xmms-0.95.tar.gz, and save it to a temporary directory. Now you need to compile and install the plug-in:

```
$ su
# tar xfvz kint_xmms-0.95.tar.gz
# cd xmms-kj
# make clean
# make vislib
# mkdir /usr/share/xmms/kjofol
# cp default.zip /usr/share/xmms/kjofol
```

These commands compile and install the plug-in, and copy the default skin to the newly created system-wide kjofol directory. Check that the plug-in is installed correctly. Run the following command and look for a file called libkjofol.so:

```
# ls -l /usr/lib/xmms/Visualization/
```

Similar to the standard skins, you can copy kjofol skins to ~/.xmms/kjofol in a user's home directory to make the skin available to that user alone. With either method, the way to show the new interface is to right-click XMMS for the options menu, select preferences and the Visualization tab. Enable the kjofol plug-in (see screenshot 9) and the new window will pop up straight away. To change the skin, either select 'configure' from this window or right-click on the new window. The resource tab has a list of all available kjofol skins.

Installing new skins is easy. Copy them to the home directory as mentioned above, or to the system directory /usr/share/xmms/kjofol. Make sure the permissions are readable, in the same way as the standard ones.

## CONTACTS

Barry Shilliday welcomes your comments on the Linux/Unix column. Email him at: [linux@pcw.co.uk](mailto:linux@pcw.co.uk). Please do not send unsolicited file attachments.

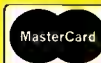


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**Tim Nott**  
Is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family

## Embedding fonts and adding macros

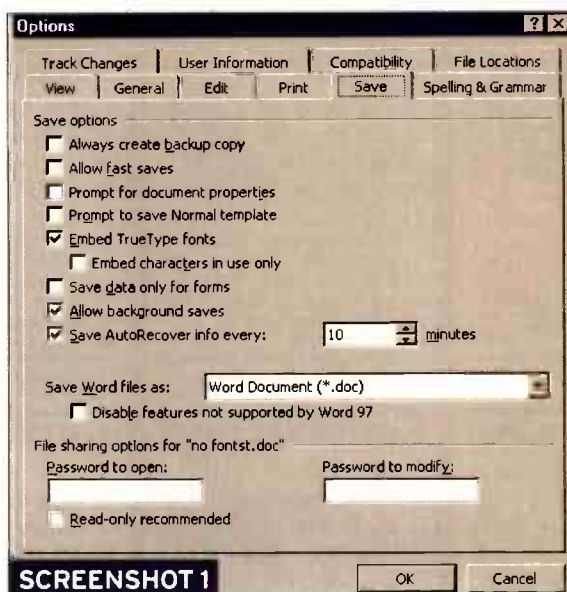
View Word documents in the right font, and add macros to the right-click menu

**H**ow can you make sure that the recipients of your Word documents see the same fonts as you saw when creating it? The answer is to print the document and post it, but if you want a more technological solution that works in email attachments, you should be OK if you stick with the standard Windows fonts. But if your creative streak compels you to use more exotic typefaces, you need font embedding.

This is a technology that lets TrueType and OpenType fonts travel with the document. It's long been a feature of Word and Powerpoint, but it's not an exclusively Microsoft tool – it's widely used in web design and Adobe Acrobat pdf documents. Embedding a font into a Word document is easy: go to the Tools, Options dialogue and turn to the Save tab, where you'll find an option to Embed TrueType fonts (see screenshot 1). This setting acts at a per-document level, and there's a sub-option to only embed characters in use, which can be useful if you want to save file size and are only using a few characters in the font.

It gets more complicated when you realise the type foundry that created the font also has a say in the matter. There are four levels of embedding permission that can be encoded into a font file – the most restrictive is no embedding at all. The font won't be embedded, though you don't get a message telling you this. The recipient will see a substituted font, though they will get an idea of what they are missing as the font name will appear in the toolbar. The next level up is print and preview embedding. The recipients will be able to view and print the document, with the font appearing correctly, but they won't be able to edit it, save it as another document, or copy the text into another document without losing the font.

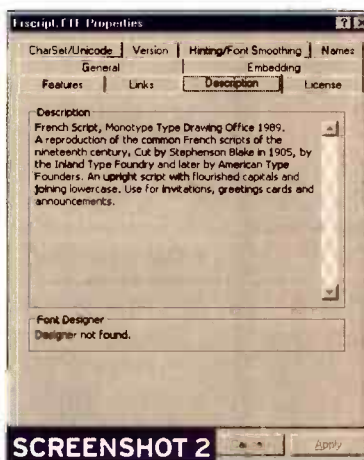
Going up a level of open-handedness we have editable embedding. Here the recipients will be able to edit the document using the full character set of the embedded font, assuming the sender hasn't chosen the 'characters in use' option. However, they will only be able to use that font in the original document – subterfuges such as copying into another document or 'Saving As...'



**SCREENSHOT 1**  
Packing up the font in the document isn't that easy

won't preserve the font formatting. The last, and most liberal, level of embedding is installable embedding. Unsurprisingly, you don't see this very often on commercial typefaces. If the recipients open a document with an installable embedded font, then the font gets automatically installed on their system. So if you are wondering where your copy of Old Emballer's Embossed came from, this could be the answer.

So, with no messages to tell you if and how a font has been embedded, how can you tell what is going on? As far as I can tell, there is no indication in the document properties, though the file size can shed some light on this. The best answer I've found is to be pre-informed of the embedding permissions of a font, and for this you need the Microsoft Font Properties



**SCREENSHOT 2**  
All you need to know about your fonts, and more

Extension. This free utility has been around for several years, but it's strange Microsoft has never included it with Windows. As well as revealing the embedding level, this can show all sorts of other information for a font, ranging from the number of glyphs to the typeface history (see screenshot 2). Download and install it from [www.microsoft.com/typography](http://www.microsoft.com/typography), and you'll find that if you right-click on a font file and choose Properties, 10 tabs of information will be at your disposal.

### Context menu

I'm a great believer in laziness. Why take your hands off the keys to set a text style for a heading, when you can do the job with a keyboard shortcut? When editing text I've already typed, however, I prefer to use the mouse, as it seems to be the natural tool for the job – there's something satisfying in swiping through text to select it and dragging blocks around. However, pushing the cursor backwards and forwards from the selection to the menus or toolbars can be tedious. For example, I often need to know how many words a block of selected text contains.

Although it's not immediately apparent, the lazy way to do this is to add the relevant command to the right-click menu. From Tools, Customise, Toolbars, tick the Shortcut Menus item, and you'll see a toolbar appear with three menus – Text, Table and Draw. Now switch to the Commands tab in the Customise dialogue, and select 'Tools' from the Categories list. From the Commands list to the right of this, drag the Word Count command on to the Text menu heading on the Shortcut Menu toolbar. This will open and give a long list of sub-menus. Keep dragging down to the Text sub-menu: this will open the normal right-click menu for editing text and you can drop the Word Count command into it. Close the Customise dialogue, and you'll find that the Word Count command is now a permanent fixture of the right-click menu. You can add macros to the right-click menu in a similar way.

### CONTACTS

Tim Nott welcomes your comments on the Word processing column. Email him at: [wp@pcw.co.uk](mailto:wp@pcw.co.uk). Please do not send unsolicited file attachments.



## Grand openings

Get straight down to business by creating shortcuts, or setting up templates and lists

**S**o many Excel users have only one main application for a spreadsheet, that it's worth reviewing the options available for getting straight down to business.

A popular method is to have a frequently-used Excel file on the desktop. Just right-click on your desktop and choose New and then Shortcut. Click the Browse button. In the Files of type box select All files, then browse for the Excel workbook. Click Open, then Next. Enter a name for the shortcut and click Finish. In future, when you open that shortcut, Excel will run and display your file.

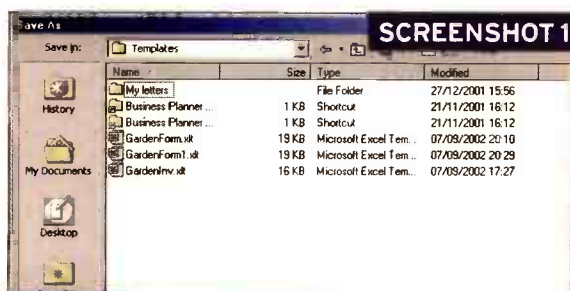
To have the shortcut on the Taskbar, right-click the shortcut. Drag it down to the Taskbar, where the Start button is, and choose Move here.

To start Excel without opening a new workbook, create a shortcut similar to the above but in the Files of type box select Programs, then look for the excel.exe file. The full path will be preceded by, and end with, double quotes. After the final double quotes, leave a space and then add /e. So, depending on the version of Excel you are using and where it is on your hard disk, the entry will look something like this: "C:\Program Files\Microsoft Office\Office10\EXCEL.EXE" /e.

### Templates

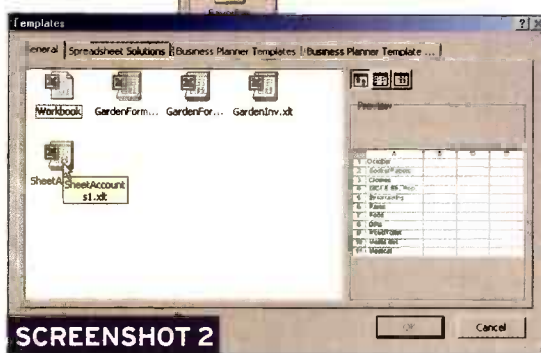
For many people, having a pre-prepared empty workbook can be useful. Templates are ideal for this. They will create a new workbook which already has the number and type of sheets you need, including the protected and hidden areas, your preferred formatting, styles, page headers and row and column labels, home-grown formulas, macros, custom toolbars, print area settings for each sheet, graphics, charts, hyperlinks, data validation settings, and window view options.

Prepare the workbook just the way you want it, then simply click Save As on the File menu. In the Save As type box, click Template. By default this file will be saved in your Templates



**SCREENSHOT 1**

Above: How to create a personalised Excel template



**SCREENSHOT 2**

Left: An illustration of the worksheet can be previewed

folder with an .xlt extension (see screenshot 1). When you open Excel and choose New file on the File menu this template will be available. Of course, you can save the template in another folder if you wish.

If you would like to see an illustration of the first page of a template in the Preview box of the Templates dialogue box (see screenshot 2), open the template file, click Properties on the File menu, click the Summary tab and then put a check in the Save preview picture checkbox.

To use the template, first open it, enter the data you need, then save it with a .xls extension. If you ever wish to make changes to the template make the changes and save the file with its .xlt extension.

### Lists

Sometimes you may wish to open a new worksheet in an existing file and quickly add a lot of column headings or row labels. You could do this with the Excel built-in Custom Lists feature, or create a macro to do the job.

Making a Custom List is easiest. Let's suppose you frequently need to have rows labelled with the items of a Balance Sheet: Premises, Machinery, Stock and so on. Enter these down a column and highlight the range. On the Tools menu choose Options and the Custom Lists tab. The addresses of the cells you've highlighted will be shown by default as the range in the

'Import list from cells' box. Click Import. Now you only have to enter the first item on the list into a cell and then, when you drag the Fill Handle (in the lower right-hand corner of the cell) down the column, the rest of the list will be entered.

If you want to have these labels added automatically to the first worksheet whenever you open a new workbook, create a file called Personal.xls and save a shortcut to it in your Excel Start Up folder, which is probably in the path C:\Windows\Application Data\Microsoft\Excel\XLSTART. Then press Alt & F11. Look for VBAProject (Personal.xls).

Double-click on Module 1 and enter:

```
Sub Auto_Open()  
Application.Window  
State = xlMaximized  
Range("A2") = "Premises"  
Range("A3") = "Machinery"  
Range("A4") = "Stock"  
End Sub
```

(Key: ✓ code string continues)

Save and close this file. If you click on the Start button and choose Programs, Microsoft Excel, the Personal.xls file will open in a full window and these labels will be added to the first worksheet.

What if you want to open an Excel workbook from within a website page? A simple line in HTML code will do it. If the file is called scores.xls and the graphic to click on the page is named marker.gif then in Internet Explorer, you could click Source on the View menu and enter this line:

```
<P ALIGN="center"><A  
HREF="scores.xls"><IMG  
SRC="marker.gif"  
BORDER=0 TITLE="Scores">  
</A></P>
```

It opens a new paragraph, centres the graphic without a border and, when you hover on the graphic, the prompting word Scores will be displayed. Clicking on the graphic opens the file, or displays an offer to Open the file or Save to disk, depending on the security options previously selected. Chances are one of these methods of creating new Excel files could save you some time.

### CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Email him at: [spreadsheets@pcw.co.uk](mailto:spreadsheets@pcw.co.uk). Please do not send unsolicited file attachments.





## Ken McMahon

became a freelance journalist after he experimented with graphics on a Commodore 64. In 1987 he bought an Apple Mac Plus before founding Pelican Graphics, and hasn't looked back since

## High-end digital cameras on holiday

This is the life... Ken McMahon takes two cameras to Venice - to test them, naturally

**C**hoosing a digital camera is not like upgrading your hard drive, or even buying a scanner. Cameras are very personal things and preferences can be, and often are, more to do with 'look and feel' factors than features and specifications.

This can make choosing a new digital camera difficult. A list of required features is a useful starting point and reviews provide more in-depth information but, beyond getting your hands on the camera, there's no way of knowing whether some foible will destroy what could have been a beautiful relationship.

So when I got the chance to take not one, but two digital cameras, both of which occupy positions close to the top of my 'would like to try' wishlist, on a short trip to Venice, it seemed too good an opportunity to miss.

The cameras are the Nikon Coolpix 5700 and Fujifilm Finepix S602 Pro Zoom, the latter reviewed in *PCW*'s April 2003 issue. Both are top-end consumer cameras aimed at serious photographers who want SLR features, but who aren't ready to spend £2,000-plus on a digital SLR.

These two models fit my criteria for a digital still camera with all-round capability, by which I mean one that I'll feel equally comfortable with shooting anything from holiday snaps, landscapes, panoramas and informal portraits to fast action watersports like kite-surfing.

### Choice criteria

One of the most important criteria for me is the ability to quickly change from auto to manual

exposure and focus modes. I often need to choose a particular aperture/shutter speed combination to limit the depth of field, or where auto-exposure simply isn't up to the task. Likewise, auto-focus is rarely the best option when shooting fast-moving subjects and is notoriously bad at coping with reflections from water. The facility to switch to semi-manual, or manual exposure and focus control is all-but-useless unless you can do it quickly, which rules out menus, and I couldn't wait to see how the cameras would cope with this.

Quality is important too, and I wanted to be able to produce A4 prints that would be of comparable quality to those made from a 35mm slide or negative. Both cameras have more than sufficient resolution for this. The S602's third-generation Super CCD produces images 2,832 x 2,128 pixels in size and Nikon's 5megapixel CCD produces images up to 2,560 x 1,920 pixels. This is more than enough resolution to produce excellent quality inkjet prints at A4 size and, providing you don't want to crop, A3 is just about possible.

On paper these are two very similar cameras. They look similar, though the Nikon is lighter and more compact, both have a right-hand moulded grip, electronic viewfinder and LCD panel (the Fujifilm's is fixed, the Nikon's folds out). The Nikkor lens has a more powerful zoom, but a more limited aperture range and they offer a similar mix of metering, exposure and focusing modes.

The Fuji has the edge in storage, offering two slots, one of which takes the traditional Fujifilm media, a Smartmedia card, while the other is a Compact Flash (CF) slot. As well as a 16MB Smartmedia card the S602 Pro

is supplied with a 340MB Microdrive. This provides capacity for around 147 2,832 x 2,128 images at the fine compression setting. By comparison, you'll get six full-resolution images on the 16MB CF card that comes with the Nikon, so there really is no point leaving the shop without an extra 256MB CF card or a 340MB Microdrive. As I already had a 256MB Smartmedia card, I used that in the S602 and 'lent' Fujifilm's 340MB Microdrive to the Nikon. The inclusion of dual slots and adequate media makes the 602 tempting for those on a limited budget, who have committed to one format or the other with their first digital camera - round one to the S602 Pro.

In a hotel room with only one European socket adaptor and two cameras, plus a mobile phone and notebook PC to keep juiced up, battery life begins to take on previously unconsidered importance. The Nikon is supplied with a Li-Ion battery with a nominal life of 90 minutes. In practice, this turned out to be a fairly accurate prediction and, if you're out for a day's shooting you'll need to take at least one spare, or buy the optional (£119.99 inc VAT) MB-E5700 battery pack which uses six AA batteries (alkaline, Li-Ion, NiCd or Ni-MH). On the plus side the charger fully replenishes the Li-Ion battery in under two hours.

The S602 pro ships with four 1,800mAh NiMH batteries and a slow charger. Fujifilm quotes battery life in terms of frames - around 250 using flash 50 per cent of the time. If you're not using the flash this increases considerably and I found that I could use the camera all day, shoot in excess of 250 frames and still have power to spare when I got home. In an emergency you can simply substitute Alkaline AAs and four of these are included in the box.

### Size and controls

The S602 is both larger and slightly heavier than the 5700, but nonetheless fits comfortably in even my small hands. The three-way switch on the shutter release goes from off to viewing then shooting mode which means to turn it on in a blind panic you just push it as far as it will go. The best thing about the camera is the mode dial which is used to choose exposure mode and to



**Best in Venice?**  
Ken McMahon took two top digital cameras on holiday

**The streets of Venice shot by the Fujifilm Finepix S602 Zoom Pro (left) and Nikon's Coolpix 5700 (right)**



**SCREENSHOT 1**



**SCREENSHOT 2**



access the settings menu. These include fully automatic, Aperture-priority, shutter-priority and manual modes. SP (Scene Position) mode is a kind of assisted AE (automatic exposure) program mode where you select from one of five types – portrait, landscape, sports, night scene and monochrome – and the camera selects the most suitable settings for the given condition.

A typical scenario is where you compose a shot in auto mode and the camera sets an aperture/shutter speed combination of, let's say 1/500 of a second at f8. But you want to focus on a foreground object and use the largest possible aperture setting to throw the distant background into a non-distracting blur. With the S602 this couldn't be easier, you just rotate the mode dial to the A position and rotate the command dial – positioned by your right thumb – to change the aperture to f2.8. The viewfinder exposure mode indicator changes to A to show you're in aperture priority mode and the shutter speed automatically adjusts to maintain the exposure value as you change the aperture. If the exposure value goes outside the shutter speed range the speed indicator turns red.

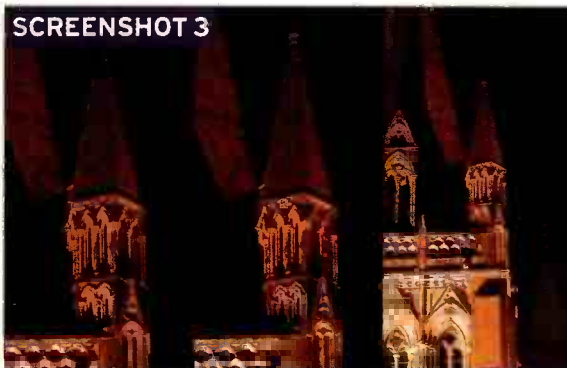
With the Coolpix 5700 it's a little more complicated. The 5700 stores settings in three user sets. From the shooting menu you can define white balance, metering, continuous shooting options, image adjustment, colour saturation, auto-focus and other camera options.

Once these settings are defined, with user set 1, 2 or 3 selected, you can change the exposure mode by pressing the mode button just behind and to the left of the shutter release and rotating the command dial, which functions pretty much exactly as the S602's.

Like the S602, the 5700 offers program, shutter priority, aperture priority and fully manual exposure modes; the currently selected mode as well as aperture and shutter speed info are displayed in the viewfinder or LCD panel and the 5700 also has a secondary mono LCD control panel.

Unlike the S602, the 5700 doesn't let you know if your selected settings will result in an over-, or under-exposed image until you press the shutter halfway down, when the lower or upper limit aperture or shutter speed setting flashes. However, the fact that the aperture setting has frozen at f2.8 while you merrily wind the shutter speed past 1/125 of a second and on towards 1/4,000 of a second may already have given you a clue.

### SCREENSHOT 3



You can bypass the menu system and quickly skip between user sets using the function button in combination with the command dial. This means you can, for example, configure user set 1 for auto white balance, matrix metering, single shooting, and auto focus and user set 2 for fluorescent light white balance, spot metering, 3fps (frames per second) continuous shooting with a wide-angle adaptor attached.

You can't assign exposure modes to a user set. If, in user set 1 mode you press the function button and rotate the command dial to change from, say, shutter to aperture priority, that becomes the exposure mode for all three user sets. I'd prefer exposure mode, flash settings, and even quality settings to be attached to user settings so you could instantly configure everything with a single operation.

Having said that, the 5700 is one of the most user-configurable cameras I've seen – more than a third of the 180-page manual is devoted to explaining the menus, covering everything from how to turn off the shutter sound to user configuration of the function button and whether settings are memorised or restored to defaults when you switch off.

The 5700 has four buttons mounted on the left side of the lens housing which provide quick access to ISO, image size, manual focus and AE lock. The ISO button doubles as a flash mode selector – pressing once cycles through the flash modes and holding it down while turning the command dial increases the ISO rating from 100 to a maximum 800.

Auto mode sets the ISO according to lighting conditions. I'm not sure about this one: where there's not enough light I'd like to make the decision to up the ISO rating and suffer the consequences, or risk subject movement or camera shake.

### Speed

In a conventional film camera, using high-speed film results in increased grain; the digital equivalent of this is

**Nikon noise reduction in action: left, noise reduction off; centre, noise reduction mode; right, clear image mode (image size automatically reduced to 960 x 1,280)**

**No photography allowed, so a tripod or flash is out of the question, but the S602 pulls it off with a 1/15-second handheld exposure at 1,600 ISO**

noise. At high ISO ratings and during long exposures, as the CCD captures more light the signal-to-noise ratio drops and image quality suffers. The 5700's noise reduction combats this to a degree (see screenshot 3). In Clear Image mode three exposures are made – two with the shutter open and one closed. Images are compared to identify and eliminate noisy pixels and a single image recorded.

In Clear Image mode resolution is limited to SXGA, the camera needs to be tripod-mounted, and it's obviously of little use where the subject is moving. For handheld shooting in low light a standard noise reduction mode can be used with full-resolution images and, if camera shake is likely, Best Shot Selector mode takes up to 10 continuous images and saves the sharpest to the card.

The S602 has the edge on the 5700 purely in terms of sensitivity, with a maximum ISO rating of 1,600 (see screenshot 4), but it has none of the noise reduction paraphernalia and, at 800 ISO and above, image size is limited to 1,280 x 960.

The Nikon's manual focus button is also dual mode – a single press cycles between infinity focus, macro and self-timer modes; holding the button down allows you to manual focus using the command wheel. I found this impossible to work with and can't imagine any circumstances in which it would be useful, other than perhaps shooting a static subject with the camera on a tripod.

By contrast the S602's manual focus is highly practical and includes a host of helpful features. You change to manual focus by means of a small switch mounted on the left side of



SCREENSHOT 4





the camera and adjust focus using a conventional focusing ring mounted on the lens. As well as the sharpness of the viewfinder image, icons tell you which direction to twist the focus ring and indicate when, in the camera's opinion, you've got it right. A button in the centre of the manual focus switch auto focuses for you.

The focus ring isn't directly coupled to the lens, but it responds with very little lag. If you're attempting to focus in difficult conditions the focus check button on the rear panel magnifies the central portion of the image providing a detailed close-up view.

The only other controls on the S602's left side are the macro button, which permits focusing down to an impressive 1cm, an info button that displays white balance, metering, ISO and other details in the viewfinder; and a Shift button which adds secondary functions to other buttons on the camera body. For example, pressing Shift and the continuous shooting button allows you to change the ISO rating by turning the command dial. Similarly, Shift & the flash button controls white balance and Shift & the exposure compensation button controls the metering mode. If this sounds like a convoluted contortion trick, well, it is, and it's the thing I like least about the S602.



**Spot the spot – caused by dust in the Finepix S602 Pro's CCD**

## Choices

Having spent three days in close confinement with both cameras it's interesting how my preferences have altered. With the Fujifilm S602 Pro Zoom it was definitely love at first sight. You can pick up and use this camera without so much as a glance in the direction of the manual, not just for point-and-shoot auto-everything snaps, but more complex situations that demand intelligent metering and manual exposure and focusing. It will run all day on one set of batteries which can be swapped with alkaline AAs, accepts Smartmedia and CF cards and comes with a 340MB Microdrive.

All this comes at an extremely competitive price of less than £650 inc VAT, making it more than £200 cheaper than the Nikon. If you add to the Coolpix 5700 the cost of a 340MB Microdrive (around £100) and the

MB-E5700 battery pack, the gap becomes considerably wider.

Initially, the Nikon's poor battery life and lack of adequate storage were irritating, as was the need to spend time reading the manual to work out how to use the program AE modes and configure the user sets. But over time the 5700 grew on me. It's more complicated than the S602 Pro, but it has more to offer if you're prepared to make the effort (and spend the cash).

The shots from my trip (including the overexposed ones I shot when I thought I was in auto mode are at [www.mooli.co.uk/pcw/venice](http://www.mooli.co.uk/pcw/venice), so judge the image quality for yourself. These are downsampled and recompressed, and won't be good for making quality comparisons, so I've also uploaded a selection of originals. You can check the Exif data for exposure settings and other info; if you don't have an application that can read Exif data, try either Canto Cumulus or Extensis Portfolio, trial versions of which were on PCW's May cover disc, or download Irfanview from [www.irfanview.com](http://www.irfanview.com).

My own view is that, in well exposed images taken in good conditions, there's little to choose between the two cameras; I'd give the Nikon the edge in terms of sharpness and resolution of detail, though I prefer Fujifilm's colour reproduction which was warmer, richer and more saturated. This is, of course, purely subjective, so take a look for yourself.

There was one spot on the Fujifilm S602 Pro's record – quite literally (see screenshot 5). In some of the images a small irregular shaped area of darker pixels – like a greasy fingerprint – was visible, particularly where the upper third was sky or light-coloured background. Sometimes there was more than one spot and they weren't always in the same place.

Fujifilm's tech support concluded that these were caused by dust particles in the CCD, which would justify a warranty replacement. I didn't notice the problem until I'd been using the camera for a couple of days, so check every aspect of your camera's performance in all kinds of conditions as soon as you can after purchase. You stand more chance of getting problems sorted out satisfactorily, plus you'll save a lot of time retouching. Now, where did I put that clone brush?

## Cameras compared

MANUFACTURER	FUJITSU	NIKON
MODEL	FUJIFILM FINEPIX S602 PRO ZOOM	NIKON COOLPIX 5700
Price inc VAT (ex VAT)	£655 (£557.40)	£869 (£739.57)
Max resolution	2,832 x 2,128 pixels	2,560 x 1,920 pixels
Lens	7.8-46.8mm Super EBC Fujinon	8.9-71.2mm Zoom-Nikkor
35mm equivalent range	35mm-210mm	35-280mm
Aperture range	f2.8-f11	f2.8-f8
Shutter speed range	1/4 - 1/2,000 in auto modes 15s - 1/10,000 manual	8-1/4,000s and bulb
Optical zoom	6x	8x
Macro	1cm	3cm
ISO range	160-1,600	100-800
Focus modes	AF, Area AF, Manual	Multi AF, Spot AF
Exposure modes	Auto, SP, P, A, S, M	Auto and 3 custom modes configurable for P, S, A, M
Flash modes	Auto, red-eye reduction, forced, slow sync, red-eye reduction+slow sync	Auto, cancel, anytime, night portrait (slow sync), red-eye reduction
Video modes	VGA, QVGA motion jpeg 30fps	QVGA 15fps Quicktime
Continuous shooting modes	5fps max 5 frames	3fps max 3 frames or 1.5fps
Storage	Smartmedia/CF/Microdrive	CF/Microdrive
Batteries	4 x NiMH or 4 x AA alkaline	EN-EL1 Li-ion
Weight with batteries	598g	538g
Accessories	16MB Smartmedia card, 340MB Microdrive, 1 x NiMH batteries and slow charger, 4 x AA Alkaline batteries, lens cap, strap, A/V cable, USB cable, Software CD	16MB Compact Flash card, EN-EL1 Li-ion battery, charger, lens cap, strap, AV cable, USB cable, Nikon View 5 software

## CONTACTS

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# Neighbourhood disputes

How to keep a wireless Lan safe from neighbours, and stream sound around the house

**N**ext-door neighbours can be the cause of many problems, but disputes over boundaries could pale into insignificance when we start trying to defend our wireless territory.

For the most part, I don't think security is that much of an issue for a home network operator, even if they have wireless connections. If I can offer an analogy; our homes nearly all have ordinary glass in the windows. If we were truly worried about the need for security, we'd replace it with armoured glass or install bars.

There are a few people for whom bars on their windows are essential. Equally, a wireless Lan (Wlan) will be safe for the most part, but some neighbours will abuse it.

If you have read anything at all about Wlans, you'll know that it isn't a secure technology. Exploits to crack the Wired Equivalent Privacy (WEP) protocol have hit the headlines recently, and security consultants can always make a little extra business for themselves by war-driving around a business district and reporting the number of insecure networks they find to a newspaper. What you won't, perhaps, know is that a simple trick will defeat most casual hackers – hide the network.

The reason this trick isn't much published is that it's not possible to hide a network using most current consumer wireless access points. With the new generation of Linksys wireless switches, however, it's simple. You have to prevent the access point broadcasting its network name, or Service Set Identifier (SSID). This is a 32-character unique identifier attached to the header of packets sent over a Wlan. It acts as a password when a mobile device tries to connect to the access point. And it's simple: if you don't know the password, you can't connect.

There are two stages to hiding the network. Assuming you have an access point that can hide its network name, first select the option that prevents the SSID from being broadcast. Second – and less obvious, perhaps, but more important if you're dealing with unpleasant neighbours – change the name to something people

Many access points, including the Linksys models, can be set to hide the network name for extra security



can't guess. The default network name for every Linksys network is 'Linksys', so if you are obliged to hack into a hidden network, that would be a good first guess. To be fair, most hidden networks will be professional ones, not using simple home-computing wireless gear, and the only way of logging onto them will be to use much more sophisticated hacking software.

A determined burglar can break into your house even if you put bars on the window, if it's worth the effort. But broadcasting your network name is the equivalent, in home security terms, of leaving the front door open and writing 'Welcome' on the mat.

If you have really important data to protect, such as commercially confidential files on your hard disk, or patient data for a hospital, you will want to go a lot further. But hiding the network so nobody knows it's there will probably stop 99 per cent of nuisance hacks for the home network operator.

## Streaming

Imagine you're listening to the radio in your sitting room and want to continue listening while you're in other parts of the house. One solution is to turn up the volume, or you could run cables throughout the house so that the loudspeakers all play the same music. But an increasingly obvious answer is to find a wireless method.

The easy way to do it is to get a wireless audio headset. If that isn't what you want – and there are lots of reasons it might not be suitable

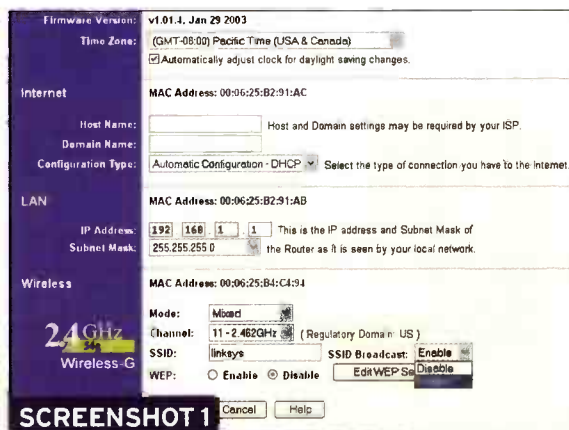
– you could try a digital video sender. That takes audio or video as an input, for example the output of the VCR or the radio, and transmits it to another sender/receiver in another room. These are available on the web from [www.sadoun.com/Sat/Products/RCA/RCAWVS150.htm](http://www.sadoun.com/Sat/Products/RCA/RCAWVS150.htm) and various other online sources, but not all of them are legal to use in Europe. And if you wanted a receiver for every room, you'd be in trouble, not least of all in terms of cost.

So, why not use a Wifi Wlan? It shouldn't take much effort, on the face of it. All you have to do is digitise the audio (or video) and then stream it onto the Lan. Then, in each room, you have a node – a PC, or a PDA, or even, if you want to impress people with your spending power, a Smart Display – where you convert the digital stream back to audio, and play it over local speakers.

It will work – sort of. The problem is, it isn't a suitable solution, because the digital stream doesn't go to all destinations simultaneously. Each loudspeaker gets its own Internet Protocol feed, and each of these starts at a different moment, buffered in the receiver.

If you've tried this, you'll know it's awful. The delay can be as much as four or five seconds. If you're listening to techno you might ask who could tell? Some people argue this type of music sounds pretty much the same over any three-minute period. But if it's serious jazz, or a voice, it's worse than silence; it's confusing and infuriating. You can miss a key event – a goal in football, for example, or a wicket in cricket – simply because you were

Careful setup can ensure your Wlan is more secure







**A PDA with wireless Lan could be used to listen to music around your home**

between speakers when it happened; if the second set had not been playing, you might have heard the cheer from the first set which you just left.

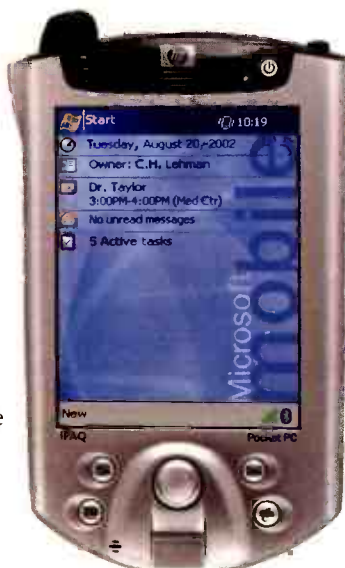
The cause of the problem is unicast versus multicast. Unicast, confusingly, is when you send multiple streams to multiple users; one stream to each user. Multicast, however, is when you send one stream to a multicast-enabled server, and it reaches multiple users.

The benefit of multicast, for web servers, is that you use far less bandwidth. A server farm capable of reaching 40,000 users with a media stream would be more costly than it is safe to think about, but a single multicast server could cope with all of them and the traffic on the Ethernet Lan would be trivial – kilobits, instead of megabits – by comparison.

So the first problem is how on earth does the home user set up a multicast server?

Using standard Windows facilities isn't going to appeal to the average user. The 'standard' Windows product is the .Net server 2003, something that will happily run on a standard Windows PC, but which will add around \$1,000 (£666) to its price. Corporate buyers may regard this as a trivial one-off cost, but home users will blanch and change the subject. Perhaps, if we ask Microsoft nicely enough, it will offer a 'home multicast server' in the next edition of XP.

There is an alternative. It's no cheaper to implement, but it is



cheaper to evaluate. Go to Real Networks' website, where it has a solution in the Helix Universal Server. There is plenty of detail at [www.realn timers.com/products/server](http://www.realn timers.com/products/server) and if you follow the link to the 30-day free trial download you can try it out. If you want to go direct to the download page, go to: <http://licensekey.realn timers.com/rnforms/products/servers/eval/index.html?ulf=s>.

## Out of step

It's a 10MB download, so perfectly manageable for most broadband users. The business of creating the digital stream was covered in Hands on in April's 25th anniversary bumper edition, so I don't have to give you chapter and verse on how to download either Windows Media 9 or Helix producer. Setting up the Helix server is fully explained in a document you download with the software. If you want to experiment, then I would recommend giving it a go – but don't solemnly work your way through it in the expectation that you will solve the problem, because you won't. At the end of the experiment, I had to tell the people at both Microsoft and Real

## 'Perhaps if we ask Microsoft nicely enough, it will offer a "home multicast server" in the next edition of XP'

**Real Networks' Helix Server can be used to stream multicast audio around your home network – but it still won't be in sync**

that multicast didn't, after all, solve the synchronisation problem. They checked and the consensus was that it nearly does, but it 'was never intended to be put to this use'.

As a senior Microsoft technician put it, there are several companies suddenly working on this problem, one of them being Audiotron. 'It is working on a product where you can synch between the listening devices; the devices tell the server which frame they are on.'

Unfortunately, even this doesn't completely solve the problem. Setting up multicast wouldn't eliminate latency; they would still wander off from each other over time. So the next project in these labs is to add code to the playback client to ensure they are synched. So if Client A gets ahead of Client B, it would slow down.

All these issues come from the fact that the scenario for streaming has been about reliable, inexpensive, delivery from point to point, and perfect synch hasn't been one

of the priorities. And it does have to be perfect; even if you got the latency down to 50 milliseconds, it would still be annoying as the ears are very sensitive to that. You'd detect an echo effect which would be quite disconcerting.

Hopefully, in a couple of months, we'll be able to download some new code, first, to do multicast without spending over \$1,000 and second, to overcome the latency delay. At any rate, it will give you an idea of where the technology will be this time next year.

## Timezones

Finally, a really disappointing snippet for PDA carriers who travel overseas. A new feature of Office 2003, which several of us have been quite excited about, was the ability of the Outlook diary to show which timezone you are in.

As anybody will know, this is one of the nastiest traps computer technology can set for you. You are in London, and you make an appointment to have lunch with a friend, Bill, in Seattle, on the west coast of America. He says: 'How about 12.30, Friday?' and you write it in.

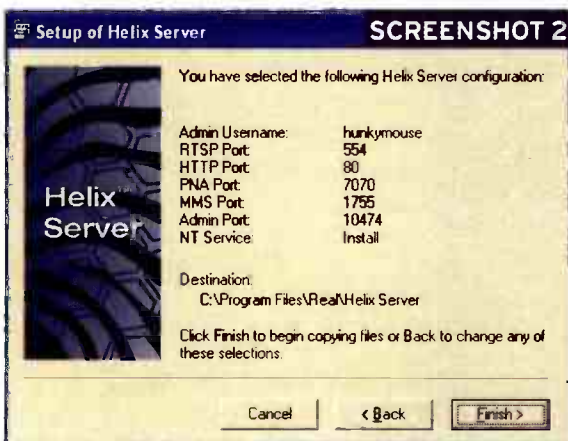
When you get to Seattle a week later, you look in your diary. It shows your appointment with Bill for 8.30pm. This only happens if you update the clock on your PC when you travel. Most travellers have learned not to do this, but our habits are going to be set at naught by improved technology.

It works like this: the last time I flew to San Francisco, I dutifully changed the timezone on my watch. My phone, to my amusement, changed timezones by itself. It appears that mobile phone operators in California now have the option to send a timezone notification to any new roaming phone that shows up in their territory; so as well as the standard spam notification of how many wonderful services Verizon offers, I found the time change was virtually automatic. Unthinkingly, I accepted the update.

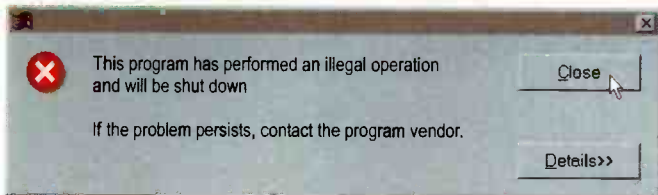
Next time I synchronised the phone – a PDA phone – with my PC, all the times were scrambled. Isn't it time someone sat down in a committee and agreed a protocol for real times and diary schedules?

## CONTACTS

**Guy Kewney welcomes your comments on the Mobile computing column. Email him at: [mobilecomputing@pcw.co.uk](mailto:mobilecomputing@pcw.co.uk). Please do not send unsolicited file attachments.**



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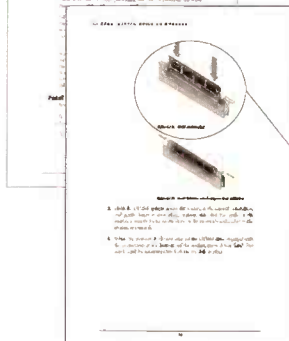
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Figure 1.1.1: Error Message Box



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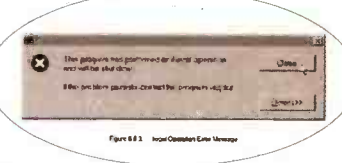
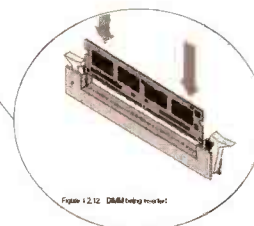


Figure 1.1.2: Error Message Box



Expertly illustrated

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**Niall Magennis**  
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# Live and Direct

We dispel some myths about DirectX and ask how big is your buffer?

**T**here is a lot of confusion about DirectX and how it relates to sound cards. In fact, it's often blamed for problems with audio when it's not at fault at all, so this month we're going to take an in-depth look at this most mysterious of Microsoft creations.

DirectX simply offers an extra software layer that controls the communication between various pieces of hardware and the operating system. Before the introduction of DirectX, programmers avoided writing games for Windows simply because they would have had to write specific code for just about every sound card and graphics card that they wanted the game to support. Instead, they stuck to writing Dos games and waited for Microsoft to come up with something that would make the Windows programmer's life easier.

That something was DirectX. It created a multimedia platform for Windows that developers could work to because it allowed them to access lots of sound and graphics hardware, without having to write specific code to support each card. DirectX first appeared in Windows 95 but the original version was so bug ridden and lacking in features that it took a couple of revisions before it caught on. Nowadays, almost everyone uses it. So how does it work and is it only relevant to gamers?

DirectX isn't a program as such. Instead, it is a collection of application programming interfaces. These act like bridges between the hardware and the software, allowing information to pass across easily. The job of making the hardware compatible with DirectX falls to the hardware manufacturers and their driver programmers. As long as the driver programmers have done a good job, then any game written to support DirectX will be compatible with the hardware.

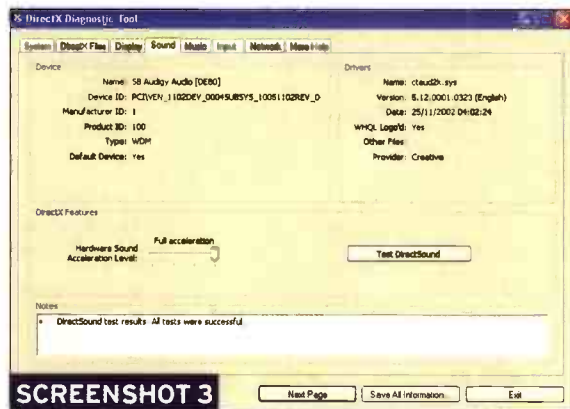
DirectX covers a range of hardware; it's not just limited to graphics and sound cards. It's really an umbrella term as there are different APIs for different functions. It includes a number of technologies including Directshow, which deals with playback of streaming audio and video (and also, bizarrely, DirectX audio plug-ins); Directdraw provides fast access to graphics



**Above:** In our experience changing the hardware acceleration level doesn't help to solve audio problems

**Right:** Winamp allows you to change the buffer size that Directsound uses

**Below:** You can use DirectX Diagnostics to see what driver your sound card is using



**SCREENSHOT 3**

computer's processor and this can result in audio glitches that you wouldn't get if you used Directsound drivers. This is especially true when using audio-intensive applications such as soft synths and audio sequencers. Also, you'll notice that your sound card's reaction to slider movements within these types of applications is much faster under Directsound. This is because Directsound can use smaller buffers so the time it takes the audio to get to your sound card from the operating system is much lower.

## Directsound

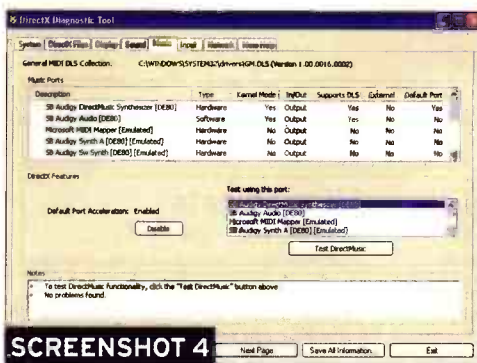
But Directsound can be confusing, as it can operate in different ways. There are four levels of Directsound operation and these can be accessed from the Windows Control Panel. To get to the settings in Windows XP click on Start, select Control Panel and then select the Sounds, Speech and Audio Devices Option. Now click on the

Change the Speaker Settings text and click on the Advanced button in the Speaker Settings box. If you click on the performance tab you'll see the slider for setting the hardware acceleration value (see screenshot 1).

This slider controls how Directsound operates and has four settings marked none, basic, standard and full. By default, in our experience at least, it's always set to full. In the help file for the control panel Microsoft says this slider can be used to troubleshoot problems with your sound card, but we've never witnessed it making any difference.

When the acceleration is set to None, Directsound is operating in Emulation mode. This is what older sound cards that don't have Directsound drivers use. It means there will be lots of latency and your sound card will essentially be behaving in much the same way as if you were using MME drivers.

Pushing the slider up to the basic setting means that Directsound is using software to mix the audio for the main outputs. Obviously, this is taxing your processor because most cards have hardware mixing that relieves this burden from your CPU and frees it up for other tasks.



SCREENSHOT 4

Use the Music tab of the DirectX Diagnostics tool to check your Midi devices work

bottom. If you keep pouring water into the bucket to keep it topped up then water will continuously come out the bottom. You can either pour in large amounts of water slowly to have a large buffer or constantly keep topping up a smaller buffer by pouring

## The future of DirectX

DirectX is currently stalled at version 9 and it looks like this is the version we're going to be using for some time. This may seem odd as we've grown used to an update of DirectX appearing almost every year since the introduction of Windows 95. The reason is that Microsoft is set to concentrate on improving Windows as a gaming platform after a lull while it concentrated on the Xbox console. DirectX is essentially a gaming platform but, as we've seen, it has some advantages for those into audio applications because it helps reduce problems with latency.

Microsoft says a new version of DirectX won't appear for probably another two years. This, it claims, is because it has built features into version 9 that will be more than capable of supporting the new developments that will arrive in graphics cards over the next couple of years.

The company is currently concentrating on Longhorn, the next version of Windows. On the DirectX front, Longhorn will introduce new features such as easier setup for online games, a standard Windows game controller configuration and possibly the ability to run games directly from CD or DVD.

The lack of updates for Directsound may appear alarming at first but Directsound in version 9 is pretty stable and feature rich. DirectX has for some time been able to support recording as well as playback of audio, and the Property Sets feature allows Directsound to work with new features of cards that may appear in the next two years.

The next setting, marked standard, uses your card's hardware to do the mixing and can make a difference to your system's performance. Hardware mixing is also faster and so reduces latency, or the delay between making a change in a software synth and hearing the difference coming from your speakers. Most cards have DSP chips that can mix lots of audio streams at once without affecting performance.

When the slider is set to full Directsound has the capability to control specific features of the sound card even if they are not officially included in the Directsound standard. This is done through the use of Property Sets. These are special instructions that tell Directsound how the extra features of your card can be used. For example, the Property Set could instruct Directsound how to use a card's onboard DSP chip to produce echo, reverb and phasing effects.

As discussed, changing these settings seems to have little effect. This is probably because most of the problems you'll experience with sound cards are driver related and knocking back the level of acceleration doesn't stop Windows from using the sound card's driver; it only changes how it is using it.

## Sound solutions

If you're experiencing nasty crackles and pops from your sound card a much better mode of attack is to increase the buffer size in the audio application. Winamp is one example of a program that allows you to change the Directsound buffer size for audio travelling to your sound card (see screenshot 2). However, if you increase the buffer by a large amount you'll find that Winamp becomes a bit unresponsive to the transport and volume controls.

But what is happening when you change the buffer size? A buffer is a storage place for audio data before it is pumped out of your sound card. It's a bit like filling a bucket with water and drilling a hole in the

small amounts of water in very quickly. Audio buffers work in the same way. Large buffer settings pour in audio data slowly so changes you make to sliders and effects in a sequencing program take longer to register but place less stress on your system. Smaller buffers need constant filling and place stress on your system, but mean sliders and transport controls react more quickly. It's a trade-off, but in music applications the rule is that shorter buffers are much better because they reduce latency. However, if the buffer is too small and the system can't keep filling it quickly enough then you will experience break-ups where there isn't enough data present in the buffer to keep the music playing.

Another way to troubleshoot DirectX problems is to use the DirectX Diagnostic Tool that is hidden in Windows XP. You can get to it by clicking on the Start menu, selecting Run and then entering dxdiag in the Open box before clicking OK. Once the program starts you'll see a number of tabs that relate to different parts of DirectX. We are interested in those marked Sound and Music. When you click on the Sound tab you'll see the hardware sound acceleration level slider which works in the same way as the slider in the control panel that we've already discussed. However, you'll also see the version number and type of driver that your sound card is using clearly displayed (see screenshot 3).

The Help tab of DirectX Diagnostics is the place to look for the sound troubleshooter



SCREENSHOT 5

There's also a test button that you can click on to see if Directsound is working. It's a similar story under the Music menu. You'll see a list of your music ports that describes the various Midi devices your computer can use, including the onboard synth on your sound card, the software synth built into Windows XP and the Midi ports that your computer can address. You can check whether they are functioning properly by using the test button at the bottom of the window (see screenshot 4).

Finally, if you click on the More Help tab you will see an entry for troubleshooting sound problems. This is the same as the troubleshooters that can be found dotted around elsewhere in Windows (see screenshot 5).

Hopefully we've shed some light on how DirectX relates to sound hardware and how you can find out if it's the source of your problems. In our experience most audio problems aren't due to Directsound itself, but to poor sound card drivers. Check the manufacturers' website and make sure you're running the latest drivers.

## CONTACTS

Niall Magennis welcomes your comments on the Sound column. Email him at: [sound@pcw.co.uk](mailto:sound@pcw.co.uk). Please do not send unsolicited file attachments.





**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

## Upload basics

We end the object story with inheritance and look at file uploads and image manipulation

**L**ast month, we outlined how you can create and refer to objects in PHP, and there's just one other major part of the object story left to be told – inheritance.

Inheritance is a way to say that a particular class of object is like another one, with a few differences, for example, with extra properties, or some different methods for accessing information. You might say that one type of object is an employee, with all their associated properties, such as National Insurance number, or next of kin. As is the way in many companies, certain benefits may only be made available to directors, so you could create an object class called director, inheriting employee. That means you'd have all the same properties, without having to define them again, and you could add new properties associated with company directors, like a large pension or private health care.

So, that's the theory, but how do you do it in PHP? The terminology is called 'extending' a class, and the new class will have all the same properties and methods as the old one, plus any new ones that are defined, like this:

```
class Employee {
    var $name ;
    var $ni_number ;
    var $next_of_kin ;
    var $salary ;

    function
issue_p45() {
    // we're so sorry ✓
    ...
}

class Director extends
Employee {
    var $huge_pension ;
    var
$private_health_policy ;
    var
$golden_handshake ;
}
```

(Key: ✓ code string continues)

So you can refer to a director's salary, or any methods that were defined, just as if they'd been defined in the director class itself, with the following – albeit unlikely – code sequence, for example:

```
$boss = new Director ;
```

```
$boss->issue_p45() ;
```

Sometimes, you might want to handle something differently in an inherited class, but that's simple too. For example, if you define a new function in the Director class, also called issue\_p45, then it will override the inherited method. You might still need to use the original, but PHP allows for that too. Here's an example, which you'd define in the Director class:

```
function issue_p45() {
    if ($this->
golden_handshake > ✓
50000) {
        // do ✓
nothing - we can't afford ✓
the pay-off
    } else {
        // time to ✓
let go
        $this->
parent::issue_p45() ;
    }
}
```

There are other functions in PHP, including those that will tell you what the parent of an object is, or what methods are available, but we won't be needing them for now.

## After objects

We'll be using objects over the coming months, but before then we need to look at some other useful tools that PHP provides. We're going to look at file uploads and PHP's image manipulation functions.

File uploads via a web browser can be a useful way to allow people to keep a website up to date. You might, for example, have a web form that allows details of new products to be added to your catalogue, but for most products, you'll also want a picture. The traditional way of doing that has been via an FTP client, but if you've gone to the trouble of allowing text information to be added to your site via a web page, you don't really want to have to force users to switch to another program to send the images.

Browser file upload is pretty common these days; you'll find it on web mail services, Internet dating pages and in the online shop building systems from companies such as 1&1. There are some dos and don'ts to remember (see File upload considerations box below). Here we'll concentrate on the basics of how you handle them in PHP.

## File upload considerations

If you're allowing browser uploads to your website, there are some important considerations you should follow. First, avoid using the file names supplied by the browser. They could include invalid or malicious characters. Instead, create a new name for the file on your computer, perhaps storing the original one so you can display it if users need to work out which picture is which.

If possible, verify that a file really is the sort of information you're expecting. For instance, check the extension if one is supplied, or use tools like PHP's `getimagesize` function to see if a file is an image. On a Unix system, you could check the results of the 'file' shell command.

Check file permissions carefully. Uploaded files will often be owned by the user ID of the web server. The pages and directories of your website may be owned by a different user ID. Depending on the server configuration, your script may be running as either ID, but usually with the server's own ID. Consider creating a directory in your web space for all the uploaded images, and allow the server to write only to that directory. Don't simply change file permissions so that the files can be left anywhere – you could be exposing your website to other scripts on the server.

Finally, if you allow the public to upload files to your server, consider not publishing them on the site until you have reviewed them. If files are available immediately, people may upload unsuitable material to your site – such as software binaries, or indecent images – and then circulate the URL to other people. If you do allow immediate publishing, you should ensure that all the uploaded files are reviewed as soon as possible.

Do you really know what people are uploading to your web server?

**SCREENSHOT 1**





## File upload basics

Uploading a file is done via a web form, and is supported by most web browsers. You need to specify an input type of 'file', and remember to specify the way the form is encoded as multipart/form-data, like this:

```
<form name="form1"
  enctype="multipart/form-
  data" method="post"
  action="myscript.php">
  <input type="file"
  name="uploadname"
  <input type="submit"
  value="upload">
</form>
```

If you're using a graphical web editor such as Dreamweaver, you can just click to insert a file upload field. You'll end up with two buttons – one labelled Browse... the other Upload. Users click the Browse button to choose a file from their hard drive, then its name will appear in the field next to the button. Clicking the Upload button submits the form and sends the file to the server.

PHP creates an array called \$\_FILES to hold information about the files that were uploaded through a form; each element of it is also an array, corresponding to the field name in which a file was uploaded. For example, \$\_FILES['uploadname'] would hold information about the file from the code fragment above. If we added a second file field with the name file2, there would also be a \$\_FILES['file2'] that we could refer to.

The information about a file is stored in other named elements, including the original name – which might not be valid on your server – the Mime type of the file, such as image/jpeg, the size, and the name of the temporary folder on the web server where it's been stored. These are called, respectively, name, type, size and tmp\_name, so \$\_FILES['uploadname']['tmp\_name'] would be the location of the file uploaded by our form above when it's stored on the server.

You can see if a file has been uploaded with the is\_uploaded\_file function, and move it to another location with move\_uploaded\_file. Figure 1 shows a script that prompts a user to choose a file, then moves it to the uploads subdirectory and prompts the user to view that directory.

In this example, we've accepted the name given by the browser, which for the reasons given in the boxout isn't a good idea. If you give public access to the upload form, add more security.

One key security and integrity check is making sure people can't upload a massive file and take all the temporary space on your web server.

The php.ini file contains an upload\_max\_filesize option which sets a fixed high limit, which you can decrease by including a hidden field in your upload form, like this, to limit size to 100KB:

```
<input type="hidden"
  name="MAX_FILE_SIZE"
  value="102400">
```

If a file is too large to be uploaded, the tmp\_name in the \$\_FILES array will be set to 'none' and the size will be zero.

## In the picture

One of the things you might want to add to your site via an upload form is picture files. If you take a lot of pictures, but aren't too hot on coding HTML, wouldn't it be great to be able to just click to upload a picture to the server and have it appear in a gallery automatically? Of course, many image programs can create HTML pages for you, with thumbnails and so forth, but you still have to upload all the bits and pieces. So, let's take a look at some of PHP's basic image functions, to create a picture gallery that will appear automatically.

The code in figure 1 gives us a way to upload images to a folder. We want to view them all – so a table is the best way. Let's assume, since people have different web browser settings, that a table three columns across, with each column 200 pixels wide will fit comfortably on most screens.

We need to scale the pictures so that they fit into the table cells, giving a neat appearance to the page. We'll make them hot links too, so that clicking shows the picture full size. First, though, we need to find the size of each one. Fortunately, PHP has some useful image functions – how many depends on whether or not you have the GD extensions, which the phpinfo function will tell you. The key one here is

FIG 1

## Code to upload a file in PHP

```
<p>Choose a file and click the upload
button</p>
<?php
if (is_uploaded_file($_FILES[
'newFile']['tmp_name'])) {
// we have a new file ...
move_uploaded_file($_FILES['newFile']
['tmp_name'], "/home/sites/home/web/
pcw-php/code/uploads/" . $_FILES['newFile']
['name']);
} else {
// we need to display the form
?>
<form enctype="multipart/form-data"
action="<?php $PHP_SELF ?>" method="post">
<input name="newFile" type="file">
<input type="submit" value="Upload">
</form>
<?php
?>
<p>Or, click to go to the
<a href="uploads/">upload folder</a>
```

(Key: ✓ code string continues)

getimagesize, which returns an array of information, of which the width is the first element and the height the next. That is, you can say:

```
$imagedata =
getimagesize($imagefile);
$width = $imagedata[0];
```

We're going to use HTML image scaling and we'll include a WIDTH= option in the tags. If you have the full PHP graphics library you could scale each image, and send a small thumbnail to the browser, but the load on the server from the scaling could be considerable.

So, for a typical image, the code to include it in the table could be

```
<TD><A HREF="mypic.jpg">
<IMG SRC="mypic.jpg"
WIDTH="195" BORDER="0">
</A></TD>
```

We'll use the following rules to scale images: if the width is less than 200, use the original; if it's less than 400, scale by 0.5; if less than 650, scale by 0.3; if less than 1,000 scale by 0.2 and if it's more than that, scale to 194 pixels.

Screenshot 2 shows the results of this. The rest of the code for the album uses the readdir function we saw in October 2000 to look for all the files, and regular expression matching to check for files ending in .png, .jpg or .gif. Next month we'll look at a more advanced solution to add to your website.

## CONTACTS

Nigel Whitfield welcomes your comments on the Web development & ecommerce column. Email him at: [webdev@pcw.co.uk](mailto:webdev@pcw.co.uk). Please do not send unsolicited file attachments.

Checking the image size with PHP ensures this photo album can be neatly laid out with a table



SCREENSHOT 2



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**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



# Managing user access

Alan Stevens configures and manages user accounts on a Windows 2000 file server

**O**ver the past couple of months I've looked at how you go about setting up a Windows file server from scratch, with the emphasis on the small business configuring a network for the first time. Continuing with that theme this month, we'll discuss user accounts and how these are best configured to manage access to resources on your server. Before I can do that, however, there is one small topic to deal with: the vexed question of whether or not to implement a Windows domain.

## What's in a domain?

To understand what domains are all about it's necessary to first examine how a Windows network without a domain works. With no domain in place, servers and user workstations are organised into workgroups, with the default workgroup, confusingly, called 'Workgroup' unless you opt for something more meaningful.

Access to servers on this type of network will be controlled by each server independently. So, in order to be able to create and edit files on server 'A' I would need a user account on server 'A'. Similarly, to use files on server 'B' I would need a separate user account on that system. Being in the same workgroup does little more than make the servers easier to find and, although I can synchronise account names and passwords (to avoid repetitive logging on to each separate server) there are no automatic facilities to help.

On a large network with lots of file servers attached, this approach is clearly going to cause problems. Management is the biggest issue because of the need to set up and maintain multiple user accounts on lots of servers. Mistakes, too, are inevitable and users could easily get locked out from their data if passwords were to get out of sync.

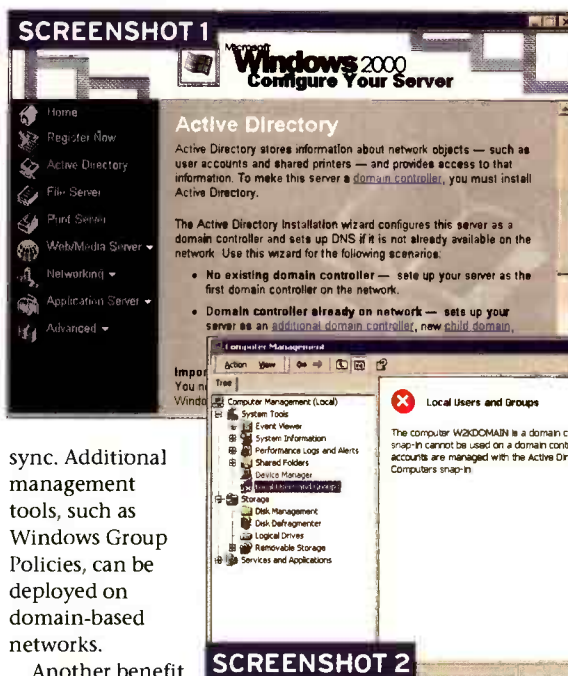
Switch to a domain, on the other hand, and only one user account and password are needed to access any member server. That's because access to the whole domain is managed via just one of the servers involved, configured as the domain controller, with others optionally as backup controllers. Management becomes a lot simpler as a result and there's no chance of passwords getting out of

sync. Additional management tools, such as Windows Group Policies, can be deployed on domain-based networks.

Another benefit is that everything you need to create and manage a domain comes with the Windows 2000 server operating system. It's quite easy to configure a server as a domain controller using the Configure Your Server wizard (see screenshot 1) that runs automatically after Windows 2000 Server and Advanced Server have been installed.

That said, there are a number of good reasons you might choose not to go down the domain route, especially on a small network. If you have only one server, opting for a domain could be counter-productive because of the overheads involved in running and managing everything that goes with it. All the more so when you realise that, as of Windows 2000, setting up a domain controller requires first the deployment of Active Directory, which has its own management issues and is a complication small businesses could well do without. As such, I would normally only recommend domains on small networks where they add real value. For instance, where you have several small networks that need to communicate with each other. In such situations organising all the networks together in one domain will make life a lot easier for administrators and users alike.

For most small, single-site networks with one shared server the benefits are a lot less certain. Plus



It's easy to configure a Windows 2000 server to be a domain controller, although on a small, single-server network a domain can be counter-productive

there isn't much you can't do without a domain, so it's not a handicap. Not having a domain doesn't, for instance, stop users from accessing shared files or printers held on the server, and you can still control exactly who sees and does what on that system. You can also run most server-based applications, such as an email or web server, with no ill effects, or manage the server remotely and so on. Bear in mind that you can always upgrade to a domain should circumstances change, but once a domain is configured getting rid of it is a far from trivial task.

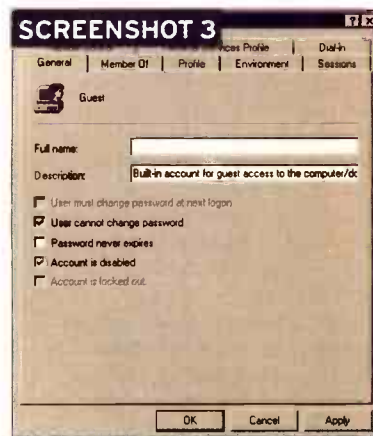
**On a server that's a member of a domain you won't be able to manage Local Users and Groups from the Microsoft Management Console**

## Managing accounts

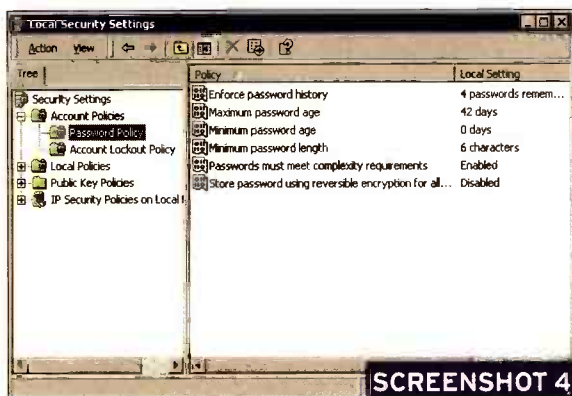
Domain considerations aside you will, at some point, need to configure user accounts, to specify who can access shared server folders, printers and applications. The easiest way of doing that is to right-click the My Computer icon and select the entry marked Manage, which starts the Microsoft Management Console (MMC) with the Computer Management snap-in preloaded and ready to use.

In the left-hand pane of this tool there should be an entry marked Local Users and Groups from which you can add, delete and edit user and group accounts. However, if this entry has a red cross next to it you're on a domain-based network and

**Always protect the Guest account with a password or disable it altogether. It's a good idea to create your own account for day-to-day management, as everyone knows about the built-in Administrator**







**SCREENSHOT 4**

access to local user/group accounts will be denied (see screenshot 2). You then need to run a different tool to manage users – the Active Directory Users and Computers snap-in, which can be accessed via the Start/Administrative Tools menu.

This tool is organised along similar lines, but here we'll concentrate on standalone servers not in a domain. In this case, you'll find two folders within Local Users and Groups, one marked Users and the other Groups.

The contents of these folders will depend on exactly how the server has been set up, but there should be at least two user accounts configured already, one for the Administrator and the other a guest account. Always make sure that you apply a password to the Administrator account and either do the same for Guest or, better still, disable this account altogether (see screenshot 3) as it's an easy way on to the server for would-be hackers. It's also a good idea to create at least one other user account with administrator rights just in case you forget the password for the built-in Administrator. You might also want to use that account for day-to-day management as, again, everyone knows about the Administrator user and if someone were to find out the password they would have all the information required to wreak havoc.

New users are very easy to add from the MMC, but there are a few rules you need to follow. One of the most basic is to ensure that the user name specified is the same as that used by the user to log on to their local PC. That may seem obvious but it's not unusual to find users logging onto their own PC with one name and password only to be asked for different credentials when they click on a shared server resource. By using the same name and password on both the server and the client PC, the user only has to log on once. Moreover, if they want to change their password, or are required to by

**Good password practice can be enforced on Windows 2000 server with facilities, for example, to require a minimum password length and level of complexity**

**User groups are a simple and easy way of managing access rights to shared server resources, rather than controlling access on an individual user basis**

the password policy on the server (see below), they can have the local and remote server accounts synchronised automatically.

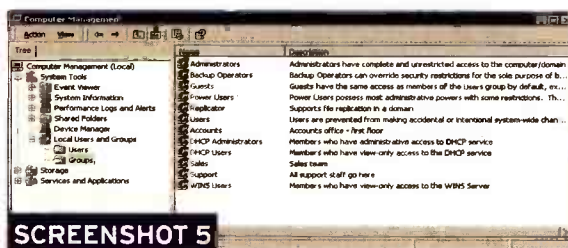
## Passwords rule

While on the subject of passwords, it's worth pointing out that these are your first line of defence in the security war. As such, users should be discouraged from divulging their passwords to anyone else or writing them down. You might also want to make sure they follow good practice guidelines by enforcing a password policy on the Windows server.

A different MMC snap-in is required to do this – the Local Security Policy snap-in (see screenshot 4), accessed from the Start/Administrative tools menu. By default the security policy will normally be very lax, so start up the snap-in then click on Account Policies followed by Password Policy to specify exactly how passwords are used on the server involved (or the domain if, you've opted for that configuration).

From here it's possible to, for example, specify a minimum password length, with six characters a good starting point. Passwords can also be required to conform with preset complexity requirements to effectively stop people using their names, single character strings, the word 'password' and other easily guessed and commonly tried passwords. Another option is password aging, whereby users can be required to change their passwords on a regular basis. And, by getting the server to remember previous passwords, you can prevent old passwords being re-used or rotated, to further tighten security.

Just how many of these options you enforce is down to individual requirements. However, at the very least consider specifying a minimum password length and complexity. You can also manage the account lockout policy from here too. That allows you, for example, to specify how many unsuccessful logon attempts will be allowed before the account involved will be disabled and how much time has to pass before it is automatically unlocked again.



**SCREENSHOT 5**

## Groups are good

There are several other user account settings you might want to investigate, such as User Profiles, to which I'll devote more space next month. I'll also discuss what you need to do at the client end to make it easy to access server resources such as shared files and printers. In the meantime, though, I just want to close with a word or two about the merits of user groups.

Because they're very simple, groups are often overlooked as management tools. However they are very easy to configure on a Windows 2000 server and I would recommend that all administrators take advantage of this option, even on a small network. The reason for this is that it's a lot easier to control access rights using groups rather than on an individual user basis.

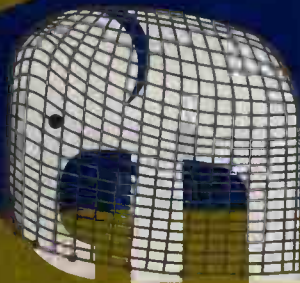
Take, for instance, the situation where a new user starts and needs to be set up on the server. When that happens, the chances are you will have forgotten exactly how you configured the various file and folder shares, printer access rights and so on when the server was first set up. But if you're using groups simply adding the new user to the appropriate group automatically gives them the same rights as the other members, turning what could be a very lengthy task into a two-minute job. Likewise, if you need to redefine a user's rights because they've changed role, reassigning them to a predefined group makes the task quick and painless.

As with user accounts a new Windows 2000 server will have a number of built-in groups, such as Administrators and Guests, as in screenshot 5. You can use these if you want or, better still, create new ones of your own to match your company structure and user roles. For example you could have a separate group for each department, such as sales, accounts, support and so on. You can then organise user accounts with these groups and manage access to resources using the techniques I'll be covering in next month's issue. As I've already said, they're often overlooked, but simple built-in facilities such as user groups are very useful and well worth using if, like most of us, you want to keep server management down to a minimum.

## CONTACTS

Alan Stevens welcomes your comments on the Networks column. Email him at: [networks@pcw.co.uk](mailto:networks@pcw.co.uk). Please do not send unsolicited file attachments.

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**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

## Readers to the rescue

Mark Whitehorn returns to standard SQL solutions and takes some random pleasures



In the May issue I provided a solution to a problem which was in non-standard SQL. I excused this deviation from my normal practice because, sadly, I thought we couldn't answer that particular question in standard SQL.

I had, of course, reckoned without the combined intellect of the PCW readership and was immediately provided with a number of solutions. One used COALESCE, an SQL function that I hadn't come across before. Another solution used UNION, a construct which I knew well, but hadn't thought of applying to this particular problem.

So, let's look at these standard SQL solutions. The basic problem was simple. Given a table like figure 1, how can you produce an answer table like this:

PickName	LastName
Bobby	Jones
Brian	Wright
IBM	Blue
Jimmy	Jones
Land	Rover
Sal	Smith

The column PickName is required to show the nickname if one exists;

Using the  
**COALESCE**  
function in  
SQL Server

otherwise it should show the value for ForeName.

The neatest solution is probably to use a function defined in the SQL 92 standard called Coalesce. This function takes a number of arguments, which are examined sequentially and the first non-null expression is returned. So, for example: coalesce(nickname, forename) will return the value for nickname if there is one. If there is a null value in nickname, then the value from forename is returned.

A practical solution to the problem which will generate the required answer table shown above is:

```
SELECT
coalesce(nickname,
forename) as PickName,
LastName
from Contacts;
```

(Key: ✓ code string continues)

Coalesce isn't supported by Access, but works fine when run against more compliant database engines, such as SQL Server (see screenshot 1).

However, to my delight, the existence of Coalesce didn't stop people coming up with an imaginative solution that uses a more common SQL construct, UNION.

In crude terms, the job of UNION is to glue answer tables together. This enables us to divide the problem into two queries, which we can then amalgamate with UNION.

The first query we need extracts the rows from the original table where there isn't a nickname. It extracts the value from LastName and puts the value from ForeName into a field called PickName.

```
SELECT Contacts.ForeName
AS PickName,
Contacts.LastName
FROM Contacts
WHERE Contacts.NickName
IS NULL;
```

**Union1**

PickName	LastName
Bobby	Jones
Brian	Wright

The second query pulls out the rows in which there is a nickname, extracts the LastName and puts the values from NickName into the field called PickName.

```
SELECT Contacts.NickName
AS PickName,
Contacts.LastName
FROM Contacts
WHERE Contacts.NickName
```

IS NOT NULL;

**Union2**

PickName	LastName
Sal	Smith
Jimmy	Jones
Land	Rover
IBM	Blue

Then you use UNION to 'add' the two answer tables together.

```
SELECT Contacts.
ForeName AS PickName,
Contacts.LastName
FROM Contacts
WHERE Contacts.NickName
IS NULL
UNION
SELECT Contacts.NickName
AS PickName,
Contacts.LastName
FROM Contacts
WHERE Contacts.NickName
IS NOT NULL;
```

which will produce the desired table shown above.

## Random pleasures

A reader wants to sort rows randomly. This is an interesting problem to which there are several facets.

The most obvious tool for solving this is to use the random number function that exists in most programming languages and applications, including spreadsheets and databases. It's worth noting that these functions don't generate truly random numbers: they look as if they're random but are, in fact, what are termed pseudo-random. It's a general computing problem that can safely be ignored for the purposes of solving this problem.

Random number functions vary between packages and between database engines. A reader has asked about a solution using Access, so that's where we'll start (the file dbcjul03.mdb is available from [www.penguinsoft.co.uk](http://www.penguinsoft.co.uk)). Access' random number function is called RND, and the obvious approach is to write a query that pulls out each row from the table and sort them using a random number. The SQL would look like this:

```
SELECT ID, ForeName, Rnd()
FROM Contacts
ORDER BY Rnd()
```

The inclusion of Rnd() as one of the fields to view isn't essential to test this query, but it helps us to diagnose the fact that this query fails. It looks as if the same random number is

**FIG1**

### Contacts

ID	ForeName	LastName	NickName	DOB
1	Sally	Smith	Sal	01/04/1956
2	Bobby	Jones		02/04/1957
3	Jim	Jones	Jimmy	03/04/1978
4	Brian	Wright		01/01/1994
5	Gordon	Rover	Land	12/05/1967
6	Big	Blue	IBM	01/04/1956



ID	ForeName	Expr1002
5	Big	0.533424
5	Gordon	0.579519
4	Brian	0.289562
3	Jim	0.301948
2	Bobby	0.774740
1	Sally	0.014018

SCREENSHOT 2

Random numbers are shown but they don't determine the order of records

generated for each row, so there is nothing to sort upon. If you run the query again, the number changes but it's still the same for each row. But why doesn't it work? What we're probably seeing is the interaction between the random function and the query optimiser. It looks as if the query optimiser is polling the random function just once – a highly optimised approach, but quite useless in this instance. This highlights the fact that there's no single solution for this problem, as it will depend on the database engine you're using. The help system may not tell you all the detail about how the random function interacts with the query optimiser, so your best bet is to experiment.

Following my own advice, I'll try a different tack. I'll 'seed' the random number function by passing it a unique number to use as the starting point for generating each random number. This should produce a different random number for each record. Happily, Access' RND lets you seed it and each record already has a unique number associated with it that I can use as a seed value. It's in the ID field – the primary key for the table – so I know every entry will be unique. My query looks like this:

```
SELECT ID, ForeName,
RND(ID)
FROM Contacts
ORDER BY RND()
```

It's progress of a sort: there's a different random number for each record now, but the rows are not sorted, as we can see from the ID field (see screenshot 2). We can, however, see from the answer table that in the first query, the query optimiser is making two calls to the random number function. Rnd(ID) in the second query generates different numbers, but the command ORDER BY Rnd() isn't working. It looks as if it has generated a set of identical and so unsortable random numbers, which is what it did in the first query.

We can fix this with:

```
SELECT ID, ForeName,
RND(ID)
FROM Contacts
ORDER BY RND(ID)
```

The rows are now in pseudo random order as we can see from the

ID column (see screenshot 3)

Furthermore, the fact that the rows aren't sorted by the value in the right hand column for RND(ID) confirms that the query optimiser is making one call to the RND function for the field to be displayed in the answer table and another for ORDER BY to use. This query is called VariableRandomSort in the sample database. It makes sense to remove the right-hand field from the final version of the query: it helped us with the diagnostic work but has now served its purpose.

### Keeping it random

What happens if we run it more than once? Will it give us a different random order each time it's run or the same random order each time? The order it produced from the first run was 5, 6, 4, 3, 2, 1 and the second time it produced 1, 5, 3, 6, 2, 4. This tells us it puts the records into a random order that varies each time the query is run.

This is perfect if you want to, say, pick 10 customers at random each month for a mailshot or prize draw. However, there's also a place for a query that generates the same random order each time so that you can pick 10 random customers one month, a different 10 the following month and so on. How do you write a query that gives a reproducible random order to the records?

My solution would be to add a field to the Contacts table. Then, using an Update query, we can insert a random number into this field. Finally, we can query the resulting table to order the records. I'll work with a copy of the Contacts table called Contacts2 to which I've added a number field called Foo. The Update query will

Top: The working solution: random ordering of records

Bottom: A static random order for records based on the random number in Foo

generate a random number by seeding with the value in the ID field, as we did before, and put it into the Foo field. Here's the SQL code for that:

```
UPDATE Contacts2 SET
Contacts2.foo = Rnd([ID]);
```

You'd run this query just once to establish a set of random numbers to use to determine the random order of the records. (This query is Update Contacts2 in the sample database).

Now we need another query to order the records by the random numbers in Foo, like this:

```
SELECT Contacts2.*
FROM Contacts2
ORDER BY Foo;
```

Running this generates the order 6, 3, 5, 1, 2, 4, (see screenshot 4) and running it a second time produces the same order. (This query is called StaticRandomSort).

This method of generating a static random sort order fails to work in SQL Server. The reason seems to be a variation in the way SQL Server's random number function generates random numbers. If you ask it for a random number without seeding it, it returns the same random number.

Another approach to ordering records randomly can be implemented during the table design process. The table will need a primary key ID field of type AutoNumber. In the design view of the table, find the New Values property in the General tab for the ID field. Change it from Increment to Random. This will generate an unique four-byte number between 2,147,483,648 and 2,147,483,647 for each record. (Once a table contains records, changing the New Values property will work for new records but won't change the ID of existing records. Each record retains the same random number as its ID number, but when the table is sorted after new records are added, the order of records changes. There's a table called RandomAutoNumber in the sample database defined like this, and a query OrderingRandomAutoNumber. Whether this solution works in your application depends on why you want your records ordered randomly.

Remember, all these random numbers and random orders we've generated are pseudo-random. Despite this, random number functions are the best tools that the computing world has come up with for everyday use and for most uses they work well.

### CONTACTS

Mark Whitehorn welcomes your comments on the Databases column. Email him at: [database@pcw.co.uk](mailto:database@pcw.co.uk). Please do not send unsolicited file attachments.

ID	ForeName	Expr1002
5	Gordon	0.979078
6	Big	0.060916
4	Brian	0.390291
2	Bobby	0.364995
3	Jim	0.489895
1	Sally	0.155663
* (AutoNumber)		

SCREENSHOT 3

ID	ForeName	LastName	NickName	DOB	Foo
5	Big	Blue	IBM	01/04/56	0.0885595
3	Jim	Jones	Jimmy	03/04/78	0.3989323
5	Gordon	Rover	Land	12/05/67	0.7460069
1	Sally	Smith	Sal	01/04/56	0.7463548
2	Bobby	Jones		02/04/57	0.7523109
4	Brian	Wright		01/01/94	0.9030988
* (AutoNumber)					

SCREENSHOT 4



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telephone

hotline is open 7 days a week 8am to 10pm

**0906 466 4429**



# Layout with Swing

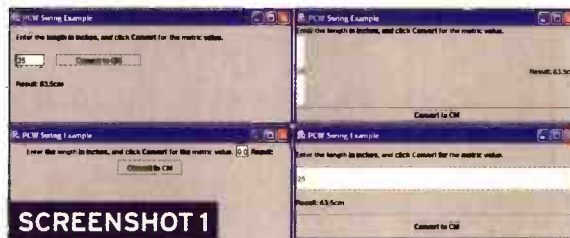
How to use layout managers to produce display-independent Java applications

In recent columns we have shown how to build a simple GUI application using Swing and the Eclipse IDE. With the application up and running, it's time to look at the issue of layout.

Java layout is one of the more perplexing aspects of the platform if you come from a Windows background. At the heart of the issue is how to achieve consistent results when you don't know how the application will be displayed. Variables include the size to which the user chooses to stretch the window, the screen resolution, the dpi (dots per inch) and the size of the fonts. Progress in display technology has led to higher resolutions and pixels that are physically closer together than on older displays so, given that users like to be able to read what is on the screen, high dpi settings and large fonts are becoming increasingly common. International applications also need to deal with the variable length of text strings when translated. English is relatively compact, so dialogues designed for English are likely to chop off text in other languages.

Windows jumps through various hoops to try to protect developers from these differences, although it's still easy to create applications that display incorrectly on systems with large fonts or a dpi other than 96.

Java is designed to work across operating systems, so AWT and Swing use a totally generic solution. This is the `LayoutManager` class. A layout manager tells a container how to position and size its components. For example, `FlowLayout` positions components one after the other; `BorderLayout` at points of the compass; and `GridLayout` with equally-sized grid cells. Some developers get frustrated with `LayoutManagers` because they can give results that appear much worse than the discredited absolute positioning. Screenshot 1 shows the effects of simply applying a `LayoutManager` to the main Frame in the example application. Of these, only the null layout or the `GridLayout` are really usable, and the `GridLayout` looks ugly, with the controls rammed against the left margin without any space and a peculiarly stretched button and input field.



SCREENSHOT 1

It should be obvious from this that the layout managers are not meant to be used this way. Instead, you have a couple of choices. One is to use an advanced layout manager, such as the `GridBagLayout` or the `BoxLayout`. However, it's worth exploring what you can do by using layout managers in the way they are meant to be used, which is in combination.

## Spacing

There are several ways you can achieve spacing around and between components. Containers have a method called `getInsets()` that you can override. This method returns an `Insets` object, with top, left, bottom and right members that specify margins. When you override `getInsets`, you should respect the margins already set by the superclass, otherwise you may get unexpected results. For example, add this code to a subclass of `JFrame` to get some space around the content:

```
public Insets getInsets() {
    Insets thisInsets =
    super.getInsets();
    return new Insets(
        thisInsets.top + 5,
        thisInsets.left + 20,
        thisInsets.bottom + 5,
        thisInsets.right + 20);
}
```

(Key: ✓ code string continues)

Many layout managers have spacing options. For example, the `GridLayout` has `Hgap` and `Vgap` properties that add spacing between its components. You can also use empty panel objects as padding.

## To stretch or not

How components stretch is important. Buttons look odd when stretched to fill a space. Single-line input fields are fine when stretched horizontally, but their height should be determined by the font. One of the first things to learn is what layout managers do to height and width.

This is what happens if you apply a single layout manager to the `pcwSwing` application. Clockwise from top left, there is the null layout, the `BorderLayout`, the `GridLayout` and the `FlowLayout`.

For example, `BorderLayout` will stretch components set to `CENTER`, while components set to `NORTH` or `SOUTH` retain their normal height, but not width. Components set to `EAST` or `WEST` retain width but not height, and `FlowLayout` retains both.

## Add layout to `pcwSwing`

Armed with knowledge, here's one way of revising the imperial to metric length conversion application we've been using over the past couple of months, `pcwSwing`, to use layout management. (If you missed the previous tutorials, you can pick up the code from [www.itwritings.com/pcw/eclipse](http://www.itwritings.com/pcw/eclipse)). From the screenshot, you can see that the `GridLayout` gives tolerable results, so it's a good starting point. Set the application to use `GridLayout` as follows:

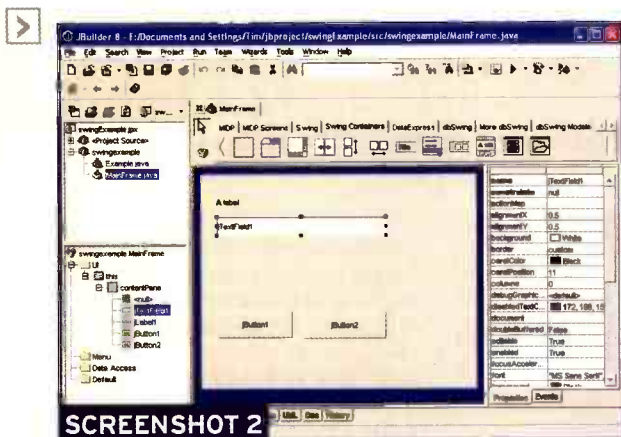
1. Replace the null layout with a `GridLayout` like this:
2. Remove all the calls to `setBounds()` in `MainFrame.java`. This means you are no longer fixing the size and position.

If you now run the application, it will set out the components in four equal-sized bars. The next step is to add margins around the main window by adding the `Insets` method above to the `MainFrame` class. Run the application again. It looks better, but the input field and the button scale incorrectly. This is because they completely fill the cell of the `GridLayout`. Fix this by adding them to a panel then adding the panel to the grid. The panel can have whatever layout you choose. `FlowLayout` preserves the normal size of its components. Here's an example:

```
inputfield.setText("0.00");
JPanel pnInput = new
JPanel();
pnInput.setLayout(new
FlowLayout(FlowLayout.
LEFT, 0, 0));
pnInput.add(inputfield);
```

You then need to add `pnInput`, rather than `inputfield`, to the container. The effect is that the `JTextField` is added to the form with its width and height determined by the text it contains. There's a small hack here, padding the text with empty spaces in order to increase the width of the field. It's not a bad hack,





because it gives extra width based on the font size, rather than some arbitrary value. Better still would be to examine the size of the font:

```
inputfield.setText(
"0.00");
FontMetrics fm =
inputfield.getFont(
inputfield.getFont());
int fieldheight =
fm.getHeight();
int fieldwidth =
fm.stringWidth(
"0.000000");
inputfield.setPreferredSize(
new Dimension(
fieldwidth,
fieldheight));
```

Alternatively, if you like the idea of the JTextField stretching to fill the width of the cell (but not the height):

```
pnInput.setLayout(new
BorderLayout());
pnInput.add(inputfield,
BorderLayout.NORTH);
```

## Adding buttons

The FlowLayout is a good choice for buttons, especially if you have more than one to add. To make this a bit more generic, imagine you have a Close button alongside Convert at the bottom of the form. The code is similar to that for the JTextField:

```
JPanel pnButtons =
new JPanel();
pnButtons.setLayout(new
FlowLayout(FlowLayout.
LEFT, 5, 0));
pnButtons.add(convert
button);
JButton closebutton =
new JButton();
closebutton.setText(
"Close");
pnButtons.add(
closebutton);
```

Here, the constructor for the FlowLayout sets the Hgap in order to get space between the buttons. A small annoyance is that the space gets added to the left of the first

A visual builder like Jbuilder can help with GUI design, although you still need to know how the various layout managers work

button, making it slightly indented. A workaround is to centre the buttons, replacing LEFT with CENTER in the code above. Another idea is to use the same Hgap for all the cells, so each one indents by the same amount. For example, here's how you can indent a label by five pixels:

```
helpLabel.setBorder(
(BorderFactory.create
EmptyBorder(0, 5, 0, 0));
```

This works for a label with an invisible border, but the space is added within the component, not around it. To get space to its left, you could use another FlowLayout, or create a padded panel by inheriting from JPanel and overriding getInsets.

## Using layout managers

Laying out Swing applications is more work than using XY Layouts, but not much more. If you use a visual builder like Borland's Jbuilder, it's even easier, although it's important to work through a code-based example first, to get an idea of what the layout managers do (see screenshot 2). You can get good results without much code and without resorting to the complexities of GridBagLayout.

## Borland, Delphi and .Net

Keeping up with Borland is a challenge these days. Frequent acquisitions along with a rapid release cycle for products such as Jbuilder and Delphi means constant changes in the Borland product family. Last year the company took over TogetherSoft, bringing high-end modelling tools and filling a gap left by Rational when it became part of IBM. More recently, Borland acquired Starbase, getting a comprehensive source code management system as well as the excellent CodeWright programmer's editor. What is

particularly interesting is the company's plans for Microsoft's .Net platform. It appears there will be two product families, one a version of Delphi for .Net and the other a brand new tool, codenamed Sidewinder, for C# development, and so positioned in direct competition to Microsoft's Visual Studio. There is no suggestion that the Win32 version of Delphi will disappear but, despite regular new releases, the core Windows product has changed little in recent years; the main activity has been in porting Delphi to Linux.

Microsoft is a tough competitor, but Borland is well-placed to add value, particularly when it comes to bridging the .Net and Java worlds, or connecting to databases other than SQL Server. Given its work on CLX (a visual component library for Linux and Windows) it's surprising that Borland does not appear to be tackling cross-platform support for .Net. There are people working on this, but not at Borland. The Mono project ([www.go-mono.org](http://www.go-mono.org)) continues to progress, and the creators of the open-source IDE SharpDevelop ([www.icsharpcode.net](http://www.icsharpcode.net)) are heading towards cross-platform support.

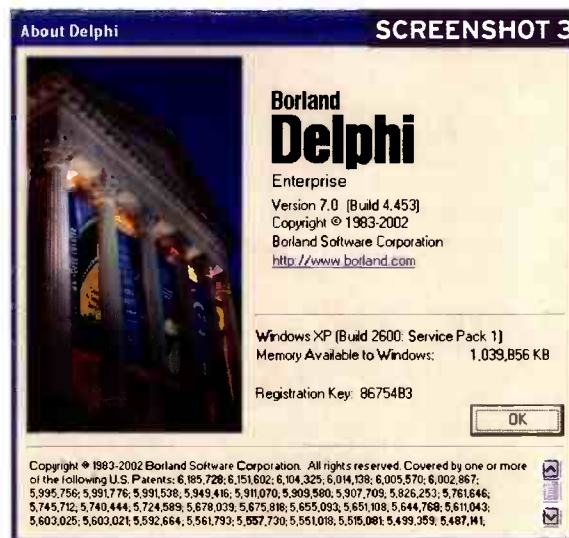
There are three efforts in terms of GUI systems. The Mono project is focused on Gtk (Gnome Toolkit) and Wine, which supports the Windows API itself on Linux. The SharpDevelop team has embraced SWT (Standard Widget Toolkit), as used by IBM for WebSphere and the Eclipse project. SWT, of course, is a Java library, but the similarity between Java and C# is such that porting the library is easier than starting from scratch. Another point is that Microsoft's Windows Forms class library is adequate, but not outstanding. SWT is arguably better designed.

It's great to see open-source efforts and, undoubtedly, cross-platform Net will happen. However, if a company such as Borland added its muscle to one of these projects, it would be a great boost. Following its work with Java and Kylix, it has the right expertise, and could bring something more distinctive than merely competing with Visual Studio. How about it, Borland?

## CONTACTS

Examples from this column, including the complete source for pcwSwing, are posted at [www.itwriting.com/pcw](http://www.itwriting.com/pcw).

Tim Anderson welcomes your comments on the Visual programming column. Email him at: [visual@pcw.co.uk](mailto:visual@pcw.co.uk). Please do not send unsolicited file attachments.





## monitors

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150SF3	15" LCD	£177	£207.98
150B3E	15" LCD	£227	£266.73
150P3E	15.1" LCD	£248	£291.40
150M1	15" LCD TV/Monitor	£455	£534.63
170S2B	17" LCD	£322	£378.35
170B2M	17" LCD	£361	£423.58
180B2S	18" LCD	£399	£468.83
180E2B	18" LCD	£509	£598.08
200P3M	20" LCD	£1029	£1209.08

## LG ELECTRONICS

Model	Size	Ex VAT	Inc VAT
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E700B	17"	£97	£113.98
Fiatron L510S	15" TFT	£170	£199.75
Fiatron L710B	17" TFT	£290	£340.75
Fiatron L810B	18" TFT	£415	£487.6
Fiatron 2010P	20" TFT	£1079	£1267.83

## TAXAN

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Exposition V735	17"	£134	£157.45
V977	19"	£186	£218.55
V2285T	22"	£545	£640.38
A15V	15" TFT	£225	£264.38

## MITSUBISHI

Model	Size	Ex VAT	Inc VAT
Diamond Plus 74	17"	£109	£128.08
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Vision 230	22"	£429	£504.08

## IIYAMA

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Vision Master 1403	17"	£89	£104.58
Vision Master Pro 1413	17"	£129	£151.58
Vision Master Pro 413	17"	£159	£186.83
Vision Master 1451	19"	£129	£151.58
Vision Master 452	19"	£209	£245.58
Vision Master Pro 454	19"	£259	£306.08
Vision Master 506	21"	£449	£527.58
Vision Master Pro 512	22"	£449	£527.58
BX3814UT	15" LCD	£189	£222.08
AX3817U	15" LCD	£229	£269.08
AS4314UT	17" LCD	£339	£398.33
AS4611UT	18" LCD	£519	£609.83

## SAMSUNG

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Synmaster 551S	15"	£66	£77.55
Synmaster 753S	17"	£79	£92.83
Synmaster 7530FX	17"	£95	£111.63
Synmaster 955B	19"	£128	£150.40
Synmaster 957P	19"	£150	£176.25
Synmaster 151S	15"	£178	£209.15
Synmaster 171S	17" TFT	£295	£351.3
Synmaster 181T	18" TFT	£469	£551.08
Synmaster 191T	19" TFT	£499	£586.3
PS42P21X	42" Plasma	£2129	£2501.58

## SONY

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X52	15" TFT	£289	£339.58
X72	17" TFT	£439	£515.83
S8	18" TFT	£509	£598.08
X82	18.1" TFT	£565	£663.88
S91	20" TFT	£575	£675.63
X202	20" TFT	£1449	£1702.58
32C1	32" Plasma	£2849	£3347.58
42B2	42" Plasma	£3199	£3758.83

## NEC

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FE771	17"	£109	£128.08
LS10B	15" LCD	£170	£199.75
LCD1760NX	17" LCD	£339	£398.33
LCD1860NX	18" LCD	£429	£504.08
LCD1920NX	19" LCD	£599	£703.83
LCD210X	20" LCD	£1579	£1855.33

## HITACHI

Model	Size	Ex VAT	Inc VAT
CM615ET	17"	£104	£122.20
CM621FET	17"	£112	£131.60
CM715ET	19"	£159	£186.83
CM721ET	19"	£199	£233.83
CM828ET	21"	£410	£481.75
CML153SXW	15" TFT	£240	£282.00
CML171SXW	17" TFT	£425	£499.38
CML181SXW	18" TFT	£575	£675.63

## CTX

Model	Size	Ex VAT	Inc VAT
VL500	15"	£74	£86.95
VL 700	17"	£82	£96.35
EX 700F	17"	£104	£122.08
VL950T	21"	£133	£156.28
VL1300	15" LCD	£40	£48.08
S500	15" LCD	£199	£233.83
S530	15" LCD	£24	£282.00
PV700	17" LCD	£309	£363.08
PV720	17" LCD	£389	£457.08
PV880C TFT	18" LCD	£599	£703.83

## notebooks

## SONY

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
Vaio PCG-C1MHP TFT	CRUSOE	867MHz	30Gb	256Mb	£1529	£1796.58
Vaio PCG-R60DHPD TFT	PIII	1.2Ghz	40Gb	256Mb	£1319	£1549.82
Vaio PCG-SRX51PBDX TFT	PIII	850MHz	30Gb	256Mb	£1559	£1831.83
Vaio PCG-VX71P DVD/CDRW	PIII	850MHz	30Gb	256Mb	£1279	£1502.82
Vaio PCG-F801 TFT/DVD	AMD	1.74 GHz	20Gb	256Mb	£719	£844.83
Vaio PCG-F902P TFT/CDRW/DVDRAM		1.6+ GHz	20Gb	256Mb	£859	£1009.33
Vaio PCG-F903P TFT/CDRW/DVDRAM		1.6+ GHz	20Gb	256Mb	£979	£1150.32
Vaio PCG-F902 TFT/CDRW/DVD	AMD	2.0 GHz	30Gb	256Mb	£819	£962.33
Vaio PCG-G815G TFT/CDRW	PIII	1.7 GHz	30Gb	256Mb	£1079	£1267.83
Vaio PCG-G815S TFT/CDRW/DVD	P4	2.4 GHz	40Gb	512Mb	£1169	£1373.58

## SAMSUNG

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
V20XCT CD TFT	C	1.7Ghz	20Gb	128Mb	£759	£891.83
V20XCT DVD TFT	C	1.7Ghz	20Gb	256Mb	£799	£938.83
V20XVC DVD/CDRW TFT	P4	2.4Ghz	30Gb	512Mb	£1129	£1326.58
P10XTD DVD TFT	P4	1.7Ghz	20Gb	256Mb	£1209	£1420.58
P10XTC DVD TFT	P4	1.9Ghz	30Gb	256Mb	£1399	£1643.83

## COMPAQ

Model	Pro.	Speed	HD	Ram	Ex VAT	Inc VAT
N1015V CD TFT	AMD	1.5Mhz	20Gb	128Mb	£559	£656.83
N1015V DVD TFT	AMD	2.0Mhz	20Gb	128Mb	£599	£703.83
N1015V DVD TFT	AMD	2.0Mhz	30Gb	256Mb	£759	£891.83
N1020V DVD/CDRW TFT	P4	2.0Ghz	40Gb	256Mb	£1079	£1267.83

## plasma displays

## PANASONIC

Model	Ex VAT	Inc VAT
DTH37PWS5BX 37"	£2,645	£3,107.88
DTH42PWS5BX 42"	£3,095	£3,663.63
DTH42PHDS5BX 42"	£3,895	£4,576.63
DTH50PHDS5BX 50"	£5,550	£6,521.25

## FUJITSU

Model	Ex VAT	Inc VAT
FG42VCA11EH 42"	£2,895	£3,401.63
FGP42HHA10ES 42"	£3,295	£3,871.63
FGPDS5001ES 50"	£4,399	£5,168.83
FGPDS6101ES 60"	£10,500	£12,337.50

## PIONEER

Model	Ex VAT	Inc VAT
PI0433MXEV 43"	£3,249	£3,817.58
PI0503MXEV 50"	£5,199	£6,108.83

## SONY

Model	Ex VAT	Inc VAT
PFM-32CL 32"	£3,215	£3,776.63
PFM-42B2E 42"	£3,295	£3,871.63
PFM-50CL 50"	£5,995	£7,044.83

## LG

Model	Ex VAT	Inc VAT
MZ-40PA10 40"	£2,695	£3,156.63
MZ-42P117 42"	£2,395	£2,814.13
MZ-50P2A3 50"	£5,095	£5,986.63
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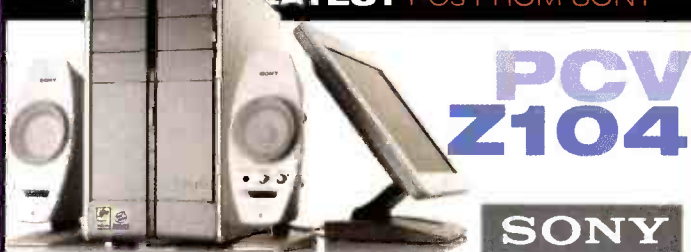
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- CompactFlash card slot
- Exif Print
- A4, 5" x 7" & 4" x 6" borderless printing
- USB connectivity



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- Exif Print
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- A4 & 4" x 6" borderless printing
- USB and Parallel connectivity



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- One Pass Multi Photo Mode scans multiple photos collectively
- Comprehensive software package including: ArcSoft PhotoStudio, PhotoBase, ScanSoft OmniPage SE



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-220	£155	£182.13	Coolpix 4300	£342	£401.85	Powershot S45	£347	£407.73
700	£330	£387.75	Coolpix SQ	£361	£424.18	Powershot S50	£397	£466.48
3020	£469	£551.58	Coolpix 5000	£509	£591.58	Powershot G3	£499	£586.33
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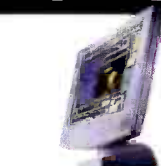
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aserjet 1300	£210	£246.75	Stylus Color C82	£74	£86.95
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aserjet 4200N	£799	£938.83	Stylus Photo 2100P	£444	£521.70
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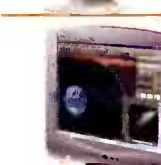
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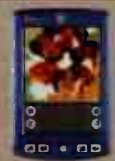
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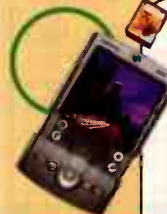
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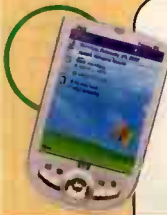


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The IXUS 400 is a stylish digital camera featuring a high quality 4 mega pixel CCD and 3 x optical zoom lens. A stainless steel shell protects the camera, while a new finish, "Super Hard Cerabrite", mixes metals and ceramics to produce a tough cool-toned exterior that is visually stunning.

- 4.0 megapixel
- 3 x Optical Zoom
- 3.6 X Digital Zoom
- Compact Flash Compatible

**£393.62**  
(£335.00)

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### Powershot A70

quicklink 2D5CPW

www.dabs.com/canon



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**Canon**

Versatile and easy to use with multiple shooting modes, ideal for home and family use.

- 3.2mfp
- 3 x Optical Zoom
- 3.2 x Digital Zoom

**only**  
**£257.32**  
(£219.00)

### Digital Cameras

quicklink	CANON	inc VAT	ex VAT
22RBPW	Powershot A200	141.00	120.00
1Y1MPW	Powershot A30	193.87	165.00
2D5CPW	Powershot A70	257.32	219.00
2557PW	Ixus V3	345.00	293.62
2FC7PW	S50	475.87	405.00
25KHPW	Powershot G3	522.87	445.00
<b>FUJIFILM</b>			
244FPW	Finepix A202	128.00	108.94
244HPW	Finepix A203	182.12	155.00
14CHPW	Finepix 2800 Zoom	245.57	209.00
221TPW	Finepix 401	304.32	259.00
177KPW	Finepix F601 Zoom	404.20	344.00
21JNPW	Finepix S602	546.37	465.00
<b>HP</b>			
21YDPW	320 Digital Camera 2.1MP	89.99	76.59
21YCPW	620 Digital Camera 2.1MP ZM	134.99	114.89
24YYPW	Photosmart 850 Cam with Dock	339.98	289.35
<b>KODAK</b>			
2FC2PW	EasysShare DX6340	245.57	209.00
2FC8PW	EasysShare LS633	276.12	235.00
<b>NIKON</b>			
1YJMPW	Coolpix 2500	276.12	235.00
27TNPW	Coolpix 3500	351.32	299.00
<b>SONY</b>			
2FC4PW	DSC-P32 Cyber-shot	174.99	148.93
2CWNPW	DSC-P52 Cyber-shot	219.00	186.39
2D39PW	DSC-P72 Cyber-shot	259.99	221.27
2FC9PW	DSC-P8 Cyber-shot	305.00	259.58
2FC8PW	DSC-P92 Cyber-shot	347.00	295.32
2FC8PW	DSC-P10 Cyber-shot	389.00	331.07
2FC9PW	MVC-CD500 Mavica	480.57	409.00
2FC9PW	DSC-V1 Cyber-shot	479.00	407.66

### Sony DSC-P72 Cyber-shot

quicklink 2D39PW

www.dabs.com/sony



**SONY**

Incredibly easy to use and compact enough to always be on hand, delivering the most stunning digital images you've ever seen. Let the digital fun begin!

- 3.2 effective Megapixels Sony Super HAD CCD
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- MPEG Movie VX with audio
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- Memory Stick PRO compatible
- 16MB Memory Stick supplied

**NEW**

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(£221.27)



### Sony DSC-P92

quicklink 2FC8PW

www.dabs.com/sony



**SONY**

This digital still camera delivers a whopping 5.0 megapixel resolution (effective) at an unprecedented value. You also get 3x optical/4x digital zoom and tons of Sony features!

**£347.00**  
(£295.32)

### Fujifilm FinePix A202 Digital Camera

quicklink 244FPW

www.dabs.com/fuji



**FUJIFILM**

The perfect choice for anyone wanting a highly affordable automatic camera that produces quality printed results. The Finepix A202 combines compact design, 2.0 megapixel resolution, video clip recording and webcam functionality.

- 2.0 megapixels
- 16MB X-d card

quicklink	FUJIFILM	inc VAT	ex VAT
244JPW	Finepix S304	307.85	262.00
27XDPW	M603	511.12	435.00

**£128.00**  
(£108.94)

### Nikon CoolPix 3100

quicklink 2FC5PW

www.dabs.com/nikon



**Nikon**

Compact and lightweight but packed with features.

- 3.0 megapixels
- 3x Optical Zoom
- 4x Digital Zoom
- 14 scene modes

**£269.07**  
(£229.00)

### HP Photosmart 850 Digital Camera

quicklink 2FCJPW

www.dabs.com/hp



**hp**

The HP Photosmart 850 is HP's premier, precision 8x optical zoom digital camera delivering superior image quality. With 56x total zoom and 4 MP resolution, it lets you capture incredible detail. Intuitive manual controls provide extra creativity.



quicklink	HP	inc VAT	ex VAT
21YDPW	Photosmart 320	76.59	89.99
21YCPW	Photosmart 620	114.89	134.99
2C9BPW	Photosmart 735	143.83	169.00
2C99PW	Photosmart 935	297.02	348.99

**£299.98**  
(£255.32)

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### Olympus MJU 300

quicklink 2FC8PW

www.dabs.com/olympus



**OLYMPUS**

Features a sleek, weatherproof, full-metal body. A precision 3x optical zoom lens and high-quality CCD with 3.2 million pixels ensure clarity and sharpness.

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(£259.00)

### Kodak Easyshare DX6340 Digital Camera

quicklink 2FC2PW

www.dabs.com/kodak



**Kodak**

For the digital photographer who wants to do more. Snap a picture with the DX6340 and you'll be impressed by your photographic genius. Something else sure to impress is its professional-quality Schneider-Kreuznach Variogon lens. The DX6340 also features programmed scene modes for a quick, simple solution for common situations - so you always get the shot you want, just the way you want it.

- 3.1 megapixels
- 4 x Optical Zoom
- 3.1 x Digital Zoom

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(£209.00)

### Dimage S414

quicklink 2FC8PW

www.dabs.com



**MINOLTA**

With Minolta's top of the line technology, 4.0 megapixel images look better than ever.

- 4.0 megapixels
- 4x Optical Zoom
- 2.2x Digital Zoom
- 16Mb Compact Flash Card

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(£229.00)

### Sony DCR-TRV33 Digital Handycam MiniDV

quicklink 2CP9PW

www.dabs.com/sony



**SONY**

Get mega pixel resolution in an impressively compact package! Sony's new DCR-TRV33 MiniDV Handycam(r) Camcorder delivers incredible 1152 x 864 digital still images. And with its impressive technology such as touch panel operation, you can access the functions of the camcorder with the included stylus. New 16:9 aspect ratio mode lets you capture up to 14% wider-angle images and create video for widescreen displays. Plus, a higher pixel count delivers improved resolution.

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### Panasonic NV-DS60B

quicklink 2H87PW

www.dabs.com



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- 12 x Optical Zoom
- Four frames per second shooting

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(£349.00)

### Digital Camcorders

quicklink	CANON	inc VAT	ex VAT
2DGPW	MV 600	386.57	329.00
2DH0PW	MV650i	645.07	549.00
21K9PW	MV5i	727.32	619.00
2FNWPP	MVX150i	774.32	659.00
Q21PW	MV30i D	938.82	799.00
RO2PW	MV30i Di	1056.32	899.00
<b>SONY</b>			
2CP4PW	DCR-TRV145 Handycam D8	308.00	262.13
2CD3PW	DCR-TRV245 Handycam D8	327.82	279.00
2CD4PW	DCR-TRV355 Handycam D8	469.00	399.15
2CP8PW	DCR-TRV22 Handycam MiniDV	565.01	480.86
2D1DPW	DCR-TRV60 Handycam	879.00	748.09
2DX0PW	DCR-PC101 Digital Handycam	985.82	839.00
11BVPW	IP7 MicroMV Pocket Camcorder	999.00	850.22
28KXPW	DCR-IP220 Network Handycam IP	1314.82	1119.00

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quicklink 2H7TPW

### Memory

quicklink	DABVALUE	inc VAT	ex VAT
KNJPW	64Mb Compact Flash	18.50	15.75
LN0PW	64Mb SmartMedia	18.50	15.75
2BHPW	64Mb Memory Stick	29.01	24.69
KNKPW	128Mb Compact Flash	32.00	27.24
153TPW	128Mb Secure Digital	49.00	41.71
14JVPW	64Mb Multimedia Card	25.26	21.50
Y1MPW	256Mb Compact Flash	59.00	50.22
2BHPW	128Mb Secure Digital	125.00	106.39
<b>LEXAR</b>			
28DDPW	64Mb Compact Flash	39.95	34.00
28DMPW	128Mb Compact Flash	72.85	62.00
28FXPW	128Mb SmartMedia	76.37	65.00
28CBPW	256Mb Secure Digital	175.07	149.00
28COPW	128Mb XD Card	75.20	64.00
<b>SONY</b>			
J7KPW	64Mb Memory Stick	35.00	29.79
Y2VPW	128Mb Memory Stick	55.00	46.81
2DMKPW	128Mb2 memory Stick	111.62	95.00
2DMLPW	64Mb Memory Stick Duo	64.62	55.00
15L1PW	128Mb Magic Gate Memory Stick	65.99	56.71

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2477PW	S200x	47.00	40.00
2478PW	i320	45.82	39.00
247CPW	i550	108.10	92.00
2974PW	i850	157.45	134.00
2973PW	i950	276.12	235.00
2D5MPW	i70	222.07	189.00
<b>EPSON</b>			
21J3PW	C42UX	51.70	44.00
2310PW	C62	69.32	59.00
25V7PW	C82	90.47	77.00
24LVPW	Photo 830	86.95	74.00
25VGPW	Photo 915	130.42	111.00
25VJPW	Photo 925	173.90	148.00
1YRQPW	Photo 950	304.32	259.00
2113PW	Photo 2100	521.70	444.00
<b>HP</b>			
21V3PW	Deskjet 3420C	49.98	42.54
22V6PW	Photosmart P7150	115.00	97.87
256NPW	Photosmart P230	139.82	119.00
24VJPW	Deskjet 6122	134.00	114.04
<b>LEXMARK</b>			
25HNPW	Z45se	57.57	49.00
25HPPW	Z55se	69.32	59.00
29SWPW	Z65P	139.82	119.00
25HQPW	Z65 Pro	182.12	155.00

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quicklink	BROTHER	inc VAT	ex VAT
10GMPW	HL1230	135.12	115.00
10GNPW	HL1440	175.07	149.00
10CTPW	HL1470N	346.62	295.00
2FF1PW	HL5040	217.37	185.00
<b>EPSON</b>			
21J4PW	EPL-6100	249.10	212.00
2B3ZPW	EPL-6100L	158.62	135.00
<b>KYOCERA</b>			
20NNPW	FS-1010	229.12	195.00
20FPWP	FS-1900D	504.07	429.00
<b>LEXMARK</b>			
10TSPW	E210	163.32	139.00
13LGPW	E320	233.82	199.00
13LHPW	E322	151.57	129.00
<b>OKI</b>			
2CTHPW	B4200	245.57	209.00
2CTJPW	B4300	276.12	235.00
<b>OMS</b>			
22TOPW	Pagepro 1200W	158.62	135.00
22T1PW	Pagepro 1250e	292.57	249.00
<b>SAMSUNG</b>			
2F9FPW	ML1510	139.82	119.00
2F9GPW	ML1710	163.32	139.00

### Scanners

quicklink	CANON	inc VAT	ex VAT
2483PW	Lide 20	54.05	46.00
24N2PW	Lide 30	76.37	65.00
2889PW	Lide 50	96.35	82.00
2C0HPW	3000F	96.35	82.00
24N3PW	5000F	175.07	149.00
24N4PW	8000F	195.87	165.00
2C0JPW	9900F	287.87	245.00
<b>EPSON</b>			
24LXPW	Perfection 1260	70.50	60.00
2445PW	Perfection 1660 Photo	131.60	112.00
2444PW	Perfection 2400 Photo	175.07	149.00
<b>HP</b>			
24VVPW	Scanjet 4570C	144.99	123.40
24VXPW	Scanjet 5500C	229.12	195.00
<b>MICROTEK</b>			
201WPPW	ScanMaker 4800 Photo	92.82	79.00
1774PW	FilmScan 3600	433.57	369.00
<b>UMAX</b>			
11HXPW	Astra 4450	118.67	101.00
28MOPW	Astra 6700	137.47	117.00

### Multifunction Devices

quicklink	CANON	inc VAT	ex VAT
288KPPW	Smartbase MPC 200 Photo	163.32	139.00
1Y27PW	Smartbase MPC 600F	257.32	219.00
<b>HP</b>			
28D3PW	OfficeJet 5110	160.00	136.17
2C6MPW	OfficeJet 6110	289.99	246.8
2C0HPW	PSC 1205	94.99	80.84
21X2PW	PSC 2110	139.99	119.14
24VRPW	PSC 2210	219.00	189.39
<b>LEXMARK</b>			
24LGPW	X75	72.85	62.00
24LHPW	X85	92.82	79.00
24LJPW	X125	146.87	125.00



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**Canoscan 3000F**  
Here's a scanner equipped with a USB 2.0 Hi-Speed Interface to give you the fastest scans ever. It provides high-quality images of your films or documents whether you're a power user or a first-timer.

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Designed for creative home users  
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- Wireless ADSL modem and Firewall router
- Built-in 4-port 10/100Mbps switch
- Share Internet connection for up to 253 users

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**NETGEAR**

- Model DG814
- The Netgear ADSL Modem Internet Gateway, combines in one small unit an ADSL modem and a 4-port 10/100mbps switch.

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**NETGEAR**

- 802.11b 11 Meg standards-based networking
- Up to 32 wireless devices per Access Point
- Up to 3 Access Points per network

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www.dabs.com/actiontec



**actiontec**

- Transform your home or office into a wireless network.
- USB Solution Provides Mobility
- Transfer Network Data Up to 11Mbps
- Simple Interface & Installation

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- Photo-quality printing across all media: 4800 x 1200 dpi resolution
- Fast printing: 15ppm mono and 9ppm colour

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**brother**

Whether you're working at home or in the office, the HL-5040 has a print speed of up to 16ppm and a print quality of 2400 x 600 dpi, so you'll get your document in seconds and looking totally professional.

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### Optical Mouse Lite

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**CREATIVE**

A high-precision and very stylish desktop mouse upgrade.  
The case has silver highlights and contains a blue light which adds a distinctive feature to the desktop.

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69 dabspoints

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**Microsoft**

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£57.57 (£49.00 ex VAT)

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quicklink 29WGP



**Microsoft**

### Wireless Optical Ice White Keyboard

The keyboard & mouse work within six feet of the receiver, even if your computer is out of sight (receiver included).

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£69.32 (£59.00 ex VAT)

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quicklink 2D6JPW



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Innovative design featuring Zero Degree Tilt™ 5-year guarantee

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47 dabspoints

quicklink 27RNPW



**Logitech**

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Cool design  
Cordless freedom  
Optical performance for both Win & Mac  
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quicklink 2F97PW

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## GeForce Ti 4200 Cards from £98.00 (£83.41)

### AGP Video Cards

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2H25PW	FX5200-DV128(NB-3.6) DVI AGP 128MB	84.50	71.92
28Q1PW	Ti4200 8X-V64 VO AGP 64MB	100.00	85.11
2H23PW	Ti4200 8X-V128 VO AGP 128MB	112.00	95.32
<b>CONNECT 3D</b>			
2DBVPM	Radeon 9000 DVI VO AGP 128MB	63.50	54.05
2DBZPM	Radeon 9000 Pro DVI VO AGP 64MB	69.00	58.73
2DC0PM	Radeon 9000 Pro DVI VO AGP 128MB	81.00	68.94
2DC1PM	Radeon 9100 DVI VO AGP 64MB	52.00	44.26
2DC2PM	Radeon 9200 DVI VO AGP 64MB	56.50	48.09
2DC3PM	Radeon 9200 DVI VO AGP 128MB	66.00	56.17
2DC4PM	Radeon 9500 DVI VO AGP 64MB	119.00	101.28
2DC5PM	Radeon 9500 Pro DVI VO AGP 128MB	134.00	114.05
2DC6PM	Radeon 9700 DVI VO AGP 128MB	191.00	162.56
2DC8PM	All-in-Wonder 9000 Pro AGP 64MB	120.00	102.13
2DC9PM	All-in-Wonder 9700 Pro AGP 128MB	341.00	290.22
<b>CREATIVE</b>			
17N7PW	GeForce MX 420 VO AGP 64MB	57.50	48.94
17N8PW	3D Blaster 4 MX440 AGP 64MB	70.50	60.00
212MPW	3D Blaster 4 Ti4200 VO AGP 64MB	107.00	91.07
<b>LEADTEC WinFast GeForce4</b>			
27Y7PW	MX440 DDR VO AGP 64MB	67.50	57.45
28R5PW	MX440 DDR VIVO AGP 64MB	84.00	71.49
28R6PW	Ti 4200 VO DVI AGP 64MB	115.00	97.88
28R8PW	Ti 4200 VO DVI AGP 128MB	129.00	109.79
29TWPW	Ti 4200 VIVO DVI AGP 128MB	138.00	117.45
28VFPW	UltraTi 4800SE VIVO DVI AGP 128MB	154.00	131.07
<b>TERRATEC</b>			
2DNQPW	GeForce 4 MX 440 VO AGP 64MB	72.50	61.71
2DNRPW	GeForce 4 Ti4200-8x DVI VIVO AGP 64MB/143.00	121.71	
2DNTPW	GeForce FX 5800 DVI VIVO AGP 128MB	417.00	354.90

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13Q8PW	SoundBlaster 5.1 Digital	43.50	37.03
2750PW	SB Audigy 2 Platinum	154.00	131.07
18C2PW	SB Extigy	129.00	109.79
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2217PW	Gamesurround Muse LT	12.50	10.64
2218PW	Gamesurround Muse 5.1 DVD	29.00	24.69
25DHWP	Gamesurround Fortissimo III 7.1	44.00	37.45
27MLPW	DigiFiber 7.1	66.00	56.17
24LSPW	Game Theater XP 6.1	105.00	89.37
<b>PURE DIGITAL</b>			
282YPW	SonicXplosion RP	48.50	41.28
2830PW	SonicXplosion DVD RP	77.50	65.96
<b>TERRATEC</b>			
28B9PW	Aureon 5.1 Fun	28.50	24.26
2155PW	SixPack 5.1+	55.50	47.24
28BCPW	Aureon 5.1 Sky	96.50	82.13
21RXPW	DMX 6Fire 24/96LT	103.00	87.66
28BDPW	Aureon 7.1 Space	107.00	91.07
21R2PW	DMX 6Fire 24/96	163.00	138.73
<b>YAMAHA</b>			
29K9PW	SW1000X PCI	335.00	285.11
2FNGPW	UWS00 USB	233.00	198.30

### DVD Drives

quicklink	ASUS	inc VAT	ex VAT
11JYPW	DVD-E616 IDE 16x DVD 40x CD	34.50	29.37
<b>LITE-ON</b>			
24C7PW	LTD-165 Retail IDE 16x DVD 48x CD	33.00	28.09
25Y1PW	LTD-166 Retail IDE 16x DVD 48x CD	33.00	28.09
<b>LG</b>			
28HJPM	GRD-B1618 DEM IDE 16x DVD 48x CD	30.00	25.54
2FNSPW	GMA-4020B IDE DVD-R/RW/RAM	174.00	148.09
<b>MITSUBISHI</b>			
2H34PM	DM2000TE OEM IDE 16x DVD 50x CD	30.50	25.96
2F0T0PW	DW7081TE IDE DVD-R/RW 4x	184.00	156.60
<b>PANASONIC</b>			
2120PW	SR-8588 IDE 16x DVD 48x CD	33.50	28.51
2FMKPM	LFD-521E IDE DVD-RAM/RW	191.00	162.56
2DHKPM	LFD-291 SCSI DVD-RAM	329.00	280.00
<b>PHILIPS</b>			
2332PW	DVDRW228K IDE DVD-R/RW 4x	195.00	165.96
<b>PIONEER</b>			
2DH6PW	DVD-120 IDE 16x DVD 40x CD	34.00	28.94
209FPW	DVD-120S IDE 16x DVD 40x CD	38.00	32.34
28N6PW	DVR-105 IDE	205.00	174.47
28N7PW	DVR-A05 IDE	230.00	195.75
<b>SAMSUNG</b>			
21F9PW	SD-616FE IDE 16x DVD 48x CD	32.50	27.66
<b>TEAC</b>			
2827PW	DV-516EK IDE 16x DVD 48x CD	44.50	31.33
2CB0PW	DV-W50K IDE DVD-R/RW 4x	236.00	172.63
<b>TOSHIBA</b>			
2DH7PW	SD-M1742KIT IDE 16x DVD 48x CD	41.00	28.89
291JPW	SD-R5002K IDE DVD-R/RW	203.00	148.00

### GeForce FX 5800 Ultra VIVO DVI 128MB

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2CNR	MX440SE VO PCI 64MB	59.50	50.64
2CNS	MX440SE VO AGP 64MB	44.00	37.45
29VB	Ti 4200 8x VO DVI AGP 64MB	100.00	85.11
29VJ	Ti 4200 8x VO DVI AGP 128MB	119.00	101.28
2CNU	Ti 4800 8x VO DVI AGP 128MB	178.00	151.49

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**Hauppauge!**

WinTV-PVR-350 puts TV watching under your control! Watch what you want, when you want. Watch TV on your PC screen, in a window or full screen, digitally record your TV shows to your PC's hard disk, or pause live TV and create your own instant replay. You can even burn your home videos or TV shows onto a CD-ROM or DVD.

### 3D Blaster 4 Ti 4800SE

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[www.dabs.com/creative](http://www.dabs.com/creative)



**CREATIVE**

- 256-bit graphics architecture
- AGP 8X support
- Memory configuration 128MB of DDR

### 3D Blaster 4 Ti 4800

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**CREATIVE**

### 3D Blaster 4 Ti 4800

quicklink **2DMMPW**  
[www.dabs.com/creative](http://www.dabs.com/creative)



- 256-bit graphics architecture
- AGP 8X support
- Memory configuration 128MB of DDR

### Radeon 9700 Pro 128MB

quicklink **2DC7PW**  
[www.dabs.com/creative](http://www.dabs.com/creative)



- TV OUT
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### SB Audigy 2 PCI RP

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**EWX**

- PCI board
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### DVD-R/RW Int IDE

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**Pioneer**

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- Maximum performance, storage capacity and reliability
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21X0PW	FHD-1 USB 2 60GB	160.00	136.17
2FNDPW	FHD-1 USB 2 80GB	188.00	160.00
21X1PW	FHD-1 USB 2 120GB	216.00	183.83
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## CD-ROM Drives

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12NTPW	CD-956E PRO Retail IDE Fifty Six	17.00	14.47
	ASUSTEK		
120SPW	CD-5520 IDE Fifty Two	17.00	14.47
1YHZPW	24x-CD IDE Twenty Four	67.00	57.03
	LITEON		
2179PW	LTN-5265-02VVC IDE Fifty Two	17.50	14.90
	NEC		
17NXPW	FX-5410 OEM IDE Fifty Four	16.00	13.62
	MITSUMI		
24MOPW	CD-3002A/MXL OEM IDE Fifty Two	18.50	15.75
	SAMSUNG		
22DPW	SC-152 IDE Fifty Two	17.00	14.47
2DDJPW	SC-152 Black IDE Fifty Two	17.50	14.90
	SONY		
15DVPW	CDU-5211 52x OEM	18.80	16.00
	TEAC		
MCJPW	CD-224PEK PCMCIA Twenty Four	88.50	75.32
21FFPW	CD-224PUK USB Twenty Four	104.00	88.51
27XSPW	CD-552E IDE Fifty Two	26.00	22.13

## PlexWriter PX-W4824TA

quicklink 252XPW

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- 48r 48w 24rw
- IDE Internal
- Buffer Under Run Protection
- VariRec Technology (Variable Recording)
- 65ms Access Time
- 4MB Buffer

**PLEXTOR**

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252WPW	PX-W4824TA/BP/K IDE 48r 48w 24rw	64.50	54.90
252XPW	PX-W4824TA/BLACK IDE 48r 48w 24rw	69.50	59.15
2CHSPW	PX-W4012TS SCSI 40r 40w 12rw	184.00	156.60
1YLZPW	PX-320A IDE 12x DVD 40r 20w 10rw	91.00	77.45
13R8PW	PX-S88TU USB 2.0 24r 8w 8rw	100.00	85.11
2BM2PW	PX-W4824TU USB 2.0 48r 48w 24rw	126.00	107.24

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The world's first multi-format DVD ReWritable drives, making DVD writing accessible to all!

The DRU500AX and DRX500ULX come bundled with a software suite designed for both novice and standard PC users.

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25V5PW	DRU-500AX DVD+R/RW CD-R/RW	246.75	210.00
25V6PW	DRX-500ULX DVD+R/RW CD-R/RW	376.00	320.00

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**£246.75**  
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## CD-ReWriters

quicklink	AOPEN	inc VAT	ex VAT
28BPW	EHW-5224U BPX USB 2.0 52r52w24rw	93.00	79.15
20W2PW	ESV-188i Bonus FW 8x DVD 24r16w10rw	147.00	125.11
	ASUS		
2CDPW	CRW-4824A IDE 40r 48w 24rw	40.50	34.47
28BJPW	CRW-5224A IDE 52r 52w 24rw	44.00	37.45
	FREECOM		
221MPW	FS-1 CDRW Slimline 24x10x24x USB 2.0	154.00	131.07
221NPW	FS-1 CDRW Slimline 24x10x24x Carbus	154.00	131.07
	LITEON		
25QPPW	UR-40122A USB 2.0 40r 40w 12rw	93.00	79.15
	MITSUMI		
206KPW	CR487ETE/OEM IDE 52r 52w 24rw	44.50	37.88
	PHILIPS		
2803PW	RWDV5210K IDE 12x DVD 40r 32w 10rw	68.00	57.88
222PPW	JR24CDRWK USB 2.0 24r 24w 10rw	109.00	92.77
2CCTPW	JR32RWDVYK USB 2.0 32x DVD 40r32w10rw	184.00	156.60
	PLEXTOR		
252WPW	PX-W4824TA/BP/K IDE 48r 48w 24rw	64.50	54.90
252XPW	PX-W4824TA IDE 48r 48w 24rw	69.50	59.15
252YPW	PX-W4824TA/BLACK IDE 48r 48w 24rw	69.50	59.15
2CHSPW	PX-W4012TS SCSI 40r 40w 12rw	184.00	156.60
1YLZPW	PX-320A IDE 12x DVD 40r 20w 10rw	91.00	77.45
13R8PW	PX-S88TU Retail USB 2.0 24r 8w 8rw	100.00	85.11
2BM2PW	PX-W4824TU USB 2.0 48r 48w 24rw	126.00	107.24
	SAMSUNG		
283YPW	SW-248BEA OEM IDE 48r 48w 16rw	43.00	36.60
2DLGPW	SW-248BEA Black OEM IDE 48r 48w 16rw	43.00	36.60
2CCYPW	SM-348 Retail IDE 16x DVD 48r 48w 24rw	67.00	57.03
	SONY		
2FC2PW	CRX220E1-10 OEM 52x 24x 52x	43.47	37.00
27XCPW	CRX210U USB 2.0 24r 12x 48x	151.57	129.00
22WXPW	CRXP90MU Combo 24x 10x 24x 8x	198.57	169.00
	TDK		
24RTPW	Cyclone 4012EU USB2 48r 40w 12rw	149.00	126.81
	TEAC		
2DHDPW	CD-W552E-002 OEM IDE 52r 52w 24rw	54.50	46.39
2DHGPW	CD-W552EK Retail IDE 52r 52w 24rw	59.50	50.64
2DHHPW	CD-W552PUK USB2 52r 52w 24rw	119.00	101.28
2DHJPW	CD-W224PUK USB2 24r 24w 10rw	133.00	113.20
	TOSHIBA		
2C24PW	SD-R1512K IDE 16x DVD 40r 32w 12rw	81.00	68.94

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quicklink 259WPW

[www.dabs.com/value](http://www.dabs.com/value)



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- CDs on spindle (no jewel cases)
- 40x Rated
- Just 16p each (ex VAT)

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**£9.00**  
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- 48x Writing CD/DVD Write Speed, 48x CD/DVD Read, 24x CD/DVD Re-Write
- PC/Mac compatible

**iomega**

**£85.50**  
**(£72.77)**

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- 48X (ICAV) Record, 24X (ICLV) Re-Write & 48X (ICAV) Read technology.
- E-IDE interface, support up to Ultra-DMA mode 2
- Innovated SMART-BURN® technology

**LITEON**

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## Fusion 40r40w12rw

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Features the new Hi-speed USB 2.0 interface.

- Hot swappable
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**LACIE**

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• 52r 52w 24rw

**LITEON**

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- Firmware upgradable
- Digital audio output (SPDIF) supported
- Industry standard E-IDE (ATAPI)

**AOpen**

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## CD-RW 52r52w24rw

quicklink 2D6LPW

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The MITSUMI CD-ReWriter CR487E TE/RET IDE features:

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- Internal Drive
- IDE rp
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- 80ms Access Time

**MITSUMI**

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## 52r 52w 32rw CD-R

quicklink 2H33PW

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- 52r 52w 24rw IDE Internal artec
- Includes NERO Software & Media

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## CDRW 48r48w16rw

quicklink 256BPW

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QBXPW	Regulator Gold Series 425VA	81.07	69.00
QXMPW	Single Outlet Surge Protector+Tel	11.75	10.00
QKGPW	4Way Strip Surge Protector 2M	12.92	11.00
QF9PW	6Way Strip Surge Protector 2M	23.82	20.00
QGNPW	8Way Strip Surge Protector 2M	41.12	35.00



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14HSPW	Duron 1.2GHz	26.50	22.56
16GBPW	Duron 1.3GHz	30.50	25.96
<b>INTEL Celeron Boxed</b>			
215KPNW	Celeron 1.7GHz	50.50	42.98
215YPW	Celeron 1.8GHz	61.50	52.34
245CPW	Celeron 2.0GHz	75.00	63.83
2CBMPW	Celeron 2.1GHz	78.50	66.81
2CBNPW	Celeron 2.2GHz	92.00	78.30
2FHPWP	Celeron 2.3GHz	106.00	90.22

### UDMA Hard Disks

quicklink	EXCELSTOR	inc VAT	ex VAT
247BPNW	Excelsior 40.0 7200	54.00	45.96
28DNPNW	Excelsior 60.0 7200	61.00	51.92
<b>WESTERN DIGITAL</b>			
10UWPW	Protege 20.0 2MB 5400	45.50	38.73
16MXPW	Protege 40.0 2MB 5400	53.00	45.11
10LZPW	Caviar 60.0 2MB 5400	66.00	56.17
10MOPW	Caviar 80.0 2MB 5400	74.00	62.98
12COTPW	Caviar 120.0 2MB 5400	103.00	87.66
10M1PW	Caviar 20.0 2MB 7200	50.50	42.98
10M3PW	Caviar 40.0 2MB 7200	56.50	48.09
255ZPW	Caviar 40.0 8MB 7200	62.50	53.20
10M4PW	Caviar 60.0 2MB 7200	67.00	57.03
251OPW	Caviar 60.0 8MB 7200	74.00	62.98
10M5PW	Caviar 80.0 2MB 7200	75.00	63.83
211KPNW	Caviar 80.0 8MB 7200	85.50	72.77
12NLPW	Caviar 120.0 2MB 7200	103.00	87.66
18HFPW	Caviar 120.0 8MB 7200	115.00	97.88
2511PW	Caviar 180.0 2MB 7200	151.00	128.51
2512PW	Caviar 180.0 8MB 7200	168.00	142.98
2513PW	Caviar 200.0 2MB 7200	187.00	159.15
2515PW	Caviar 200.0 8MB 7200	201.00	171.07
2CCKPW	Caviar 250.0 7200	295.00	251.07

### External Hard Disks

quicklink	IOEMGA	inc VAT	ex VAT
21FNPNW	Portable 20.0 USB 2	126.00	107.24
21FPNPW	Portable 40.0 USB 2	156.00	132.77
21FRPNW	Portable 40.0 FireWire	159.00	135.52
<b>LACIE</b>			
255KPNW	80GB 7200rpm USB2 d2	151.57	129.00
255LPNW	120GB 7200rpm USB2 d2	186.82	159.00
2557PW	200GB 7200rpm USB2 d2	257.52	219.00
2558PW	80GB 7200rpm Firewire d2	163.32	139.00
2559PW	120GB 7200rpm Firewire d2	186.82	159.00
255BPNW	200GB 7200rpm Firewire d2	257.52	219.00
28VCNPW	250GB Firewire d2	374.82	319.00
28VFPW	400GB 7200rpm Firewire d2	539.32	459.00
28VHPW	500GB Firewire d2	673.27	573.00
<b>MAXTOR</b>			
14JQPNW	MPS 3000LE 40.0 USB 2.0 2MB 5400	111.00	94.47
1Y53PNW	MPS 3000LE 120.0 USB 2.0 2MB 5400	166.00	141.28
28MDPNW	5000LE 80.0 USB 2.0 9 2MB 5400	139.00	118.30
12DKPNW	5000LE 80.0 USB 2.0 9 2MB 7200	148.00	125.96
2971PNW	5000DV 120.0 USB/Fire 9 2MB 7200	194.00	165.11
2CQ3PNW	5000DV 200.0 USB/Fire 9 8MB 7200	244.00	207.66

### Flash memory

quicklink	DABSVUE	inc VAT	ex VAT
KNFNPW	32Mb Compact Flash 26x	12.50	10.64
KNJPW	64Mb Compact Flash 26x	18.50	15.75
KNKPW	128Mb Compact Flash 26x	32.00	27.24
Y1MPW	256Mb Compact Flash 26x	59.00	50.22
14JXPW	512Mb Compact Flash 26x	119.00	101.28
2CQCPW	1GB Compact Flash 26x	346.00	294.47
KN7PW	32Mb SmartMedia	10.00	8.51
LNQPW	64Mb SmartMedia	18.50	15.75
ZOCNPW	128Mb SmartMedia	34.00	28.94
TUNPW	32Mb MMC	13.00	11.07
14JNPW	64Mb MMC	24.00	20.43
2999PW	64Mb MMC + SD/MMC USB Reader	37.00	31.49
28BFPW	128Mb MMC	47.00	40.00
28HPPW	64Mb Memory Stick	29.00	24.69
28HRPW	128Mb Memory Stick	50.00	42.56
1535PW	64MB SD	27.00	22.98
1537PW	128MB SD	49.00	41.71
28HNPW	256MB SD	125.00	106.39
24BHPW	6 in 1 Card Reader	23.00	19.58
153VPW	32MB USB Drive	18.00	15.32
153WPW	64MB USB Drive	22.00	18.73
153XPW	128MB USB Drive	35.50	30.22
28MSPW	256MB USB Drive	65.00	55.62

### AMD Athlon XP 2400+ 2GHz Socket A

quicklink 24T9PW

[www.dabs.com/amd](http://www.dabs.com/amd)



AMD Athlon XP - with QuantiSpeed architecture powers the next generation of computing platforms.

quicklink	AMD Athlon XP	inc VAT	ex VAT
28P4PW	AthlonXP 1700+ 1.47GHz 266MHz	47.00	40.00
28P5PW	AthlonXP 1800+ 1.53GHz 266MHz	51.00	43.41
28P7PW	AthlonXP 2000+ 1.67GHz 266MHz	55.00	46.81
28P8PW	AthlonXP 2100+ 1.73GHz 266MHz	66.50	56.60
21X3PW	AthlonXP 2200+ 1.80GHz 266MHz	68.50	58.30
24T9PW	AthlonXP 2400+ 2GHz 266MHz	88.00	74.90
28P9PW	AthlonXP 2600+ 2.08GHz 333MHz	127.00	108.09
28Z6PW	AthlonXP 2700+ 2.17GHz 333MHz	152.00	129.37
2CYCPW	AthlonXP 2500+ 1.83GHz 333MHz	104.00	88.51
2CYCPW	AthlonXP 2800+ 2.08GHz 333MHz	189.00	160.86
2CYLPW	AthlonXP 3000+ 2.25GHz 333MHz	273.00	232.34



### Intel® Pentium® 4 Processor 2.53Mhz

quicklink 2168PW

[www.dabs.com/Intel](http://www.dabs.com/Intel)



Intel® Pentium® 4 processor is designed to deliver performance across applications & usages where end users can truly appreciate it.

quicklink	INTEL	inc VAT	ex VAT
1Y25PW	Pentium 4 2.40 400MHz	146.00	124.26
2166PW	Pentium 4 2.40 533MHz	143.00	121.71
2168PW	Pentium 4 2.53 533MHz	171.00	145.54
245VPW	Pentium 4 2.53 533MHz	212.00	180.43
245WPW	Pentium 4 2.67 533MHz	211.00	179.58
245VPW	Pentium 4 2.80 533MHz	321.00	273.20
28LXPW	Pentium 4 3.06 533MHz	499.00	424.69



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quicklink	DESCRIPTION	inc VAT	ex VAT
WVLPW	256MB 184Pin DIMM PC2100 DDR RAM Non-Parity	CL2.5	
SHVPW	256MB 168Pin DIMM PC133 SDRAM Non-Parity	CL2	
SHHPW	128MB 168Pin DIMM PC133 SDRAM Non-Parity	CL2	
17BVPW	512MB 184Pin DIMM PC2100 DDR RAM Non-Parity	CL2.5	
SGTPW	128MB 168Pin DIMM PC100 SDRAM Non-Parity	CL2	
SHVPW	256MB 168Pin DIMM PC133 SDRAM Non-Parity	CL3	

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### Deskstar 180GXP 180GB UDMA100

quicklink 27TLPW

[www.dabs.com](http://www.dabs.com)



- 180GB IDE Hard Disk Drive
- 7200rpm
- 8.5ms

quicklink	HITACHI / IBM Deskstar	inc VAT	ex VAT
1YHDPW	Deskstar 120GXP 41.2 7200	55.50	47.24
27TGPW	Deskstar 180GXP 60.4 2MB 7200	64.50	54.90
295BPNW	Deskstar 180GXP 82.5 2MB 7200	71.00	60.43
27THPW	Deskstar 180GXP 123.5 2MB 7200	92.50	78.73
27TJPW	Deskstar 180GXP 123.5 8MB 7200	98.50	83.83
27TLPW	Deskstar 180GXP 185.2 2MB 7200	152.00	129.37



### Barracuda ATA V 80GB 7200rpm

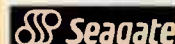
quicklink 25KCPW

[www.dabs.com/seagate](http://www.dabs.com/seagate)



- 8MB Cache/Buffer Size
- 9.0ms Average Seek Time
- Interface Type DMA/ATA-100 (Ultra)

quicklink	SEAGATE	inc VAT	ex VAT
25QCPW	U Series X 20 20 UDMA100 2MB 5400	45.00	38.30
20ZPW	U6 40810 40 UDMA100 512kb 5400	47.50	40.43
2GZAPW	Barracuda 5400 1.40 UDMA100 5400	48.00	40.86
1021PW	Barracuda ATA IV 80 UDMA100 7200	73.50	62.56
25KBPW	Barracuda ATA V 60 UDMA100 7200	67.00	57.03
25KFPW	Barracuda ATA V 80 UDMA100 7200	77.00	65.54
25KKPW	Barracuda ATA V 120 UDMA100 7200	100.00	85.11
25KLPW	Barracuda ATA V 120 SATA150 7200	129.00	109.79
2FZNPW	Barracuda 7200 7 40 UDMA100 7200	57.50	48.94
2FZQPW	Barracuda 7200 7 80 UDMA100 7200	74.50	63.41



### DiamondMax Plus 9 80.0GB 7200rpm

quicklink 259JPNW

[www.dabs.com/maxtor](http://www.dabs.com/maxtor)



Expand your computer's storage capacity with the high performance DiamondMax Plus 9 hard drive.

quicklink	MAXTOR DiamondMax Plus 9/9	inc VAT	ex VAT
24YCPW	Plus8 30.0 2Mb 7200	50.00	42.56
24YDPW	Plus8 40.0 2Mb 7200	56.50	48.09
24YFPW	Plus9 60.0 2Mb 7200	68.50	58.30
24YHPW	Plus9 80.0 2Mb 7200	75.00	63.83
259YPW	Plus9 120.0 2Mb 7200	99.00	71.49
259ZPW	Plus9 120.0 8Mb 7200	112.00	84.26
25B1PW	Plus9 160.0 2Mb 7200	132.00	95.32
25B2PW	Plus9 160.0 8Mb 7200	146.00	131.07
29LWPW	Plus9 200.0 7200	187.00	159.15
29LXPW	Plus9 200.0 8Mb 7200	193.00	164.26



### Lacie PocketDrive 20GB USB 2 & Firewire

quicklink PMTPW

[www.dabs.com](http://www.dabs.com)



The PocketDrive's name gives away one of its key features and its main attraction - it's almost unbelievably small. So small you can easily drop one in a bag or a large pocket and carry it around.

quicklink	LACIE	inc VAT	ex VAT
1517PW	PocketDrive 40GB, Firewire and USB2	186.82	159.00
25L1PW	PocketDrive 60GB, Firewire and USB2	257.52	219.00
2163PW	PocketDrive 20GB, USB2 cable	128.07	109.00
2165PW	PocketDrive 40GB, USB2 cable	169.20	144.00
252LPW	PocketDrive 60GB, USB2 cable	245.57	209.00



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quicklink	AOpen	inc VAT	ex VAT
240CPW	MX35LE-UN VIA PLE133T FC-PCA2 MATX	44.00	37.45
155HPW	AX34-U VIA 694T FC-PCA2 ATX	47.50	40.43
28RTWP	AX4R Plus E720S Socket 478 ATX	121.00	102.98
28RVPW	AX4GE Tube-G Intel 845GE So478 ATX	133.00	113.20
28RXPW	AX4PE Tube-G Intel 845PE So478 ATX	125.00	106.39
21X7PW	MX4GR Intel 845G Socket 478 MATX	73.50	62.56
21X8PW	AX4B-533 Intel 845E Socket 478 ATX	64.50	54.90
155MPW	AX4BS-V Intel 845 Socket 478 ATX	54.00	45.96
280CPW	AX4GE MAX Intel 845GE So478 ATX	108.00	91.92
280DPW	AX4PE MAX Intel 845PE So478 ATX	101.00	85.96
280GPW	AX4GER Intel 845GE Socket 478 ATX	77.00	65.54
280JPW	AX4PER Intel 845PE Socket 478 ATX	70.00	59.58
280KPW	MX4GER Intel 845GE So478 MATX	75.00	63.83
155RPW	AX4S-V S5 645 Socket 478 ATX	46.00	39.15
280LPW	AX4S-8X MAX S5 648 Socket 478 ATX	85.00	72.34

**AOpen**

### Iomega Zip 250 USB Host Powered

quicklink 131LPW

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- The quick way to save, share and manage your information
- Connects to any USB port or notebook PC
- Hot-swappable
- Media not included

**iomega**

quicklink	IOMEGA	inc VAT	ex VAT
1008PW	Peerless USB 20GB Bundle	245.57	209.00
10PCPW	Ultimate Slim Zip 100MB H/Powered	57.58	49.00

### SoA VIA KT400 ATX

quicklink 280YPW

[www.dabs.com/aopen](http://www.dabs.com/aopen)



- Memory Slots: DIMM x 3
- Chipsets: VIA Apollo KT400+VT8235
- CPU Bus Clock: 333MHz (EV6)
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### S478 Intel 845PE ATX

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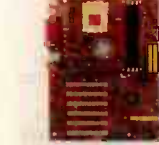
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- Northbridge: VIA KT400
- Realtek 8100BL Ethernet 10/100MB LAN controller

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- CPU: AMD Athlon XP/Athlon/Duron CPU, 333MHz
- Chipset: nVidia nForce2 IGP (Crush 18Gi, nVidia MCP-T)
- Main Memory: DDR DIMM x3
- Graphics: 8X AGP slot
- Form Factor: AT

### Motherboards

quicklink	ASRock	inc VAT	ex VAT
201NPW	GE Pro HT S5 650 Socket 478 MATX	53.00	45.11
201PPW	PE Pro S5 645 Socket 478 ATX	43.00	36.60
201RPW	P45450 Intel 845D Socket 478 ATX	48.00	40.86
201QPW	K7V12 VIA KT266 Socket A ATX	40.50	34.47
201SPW	K7M12 VIA KM266 Socket A MATX	45.50	38.73
2FCAPW	K758X S5 746FX Socket A ATX	50.00	42.56
<b>ASUSTEK</b>			
2811PW	PAPE/LAN/GD Intel 845PE So478 ATX	93.00	79.15
286FPW	PAPE/LF/SA/GD Intel 845PE So478 ATX	110.00	93.62
2036PW	PAPE 8P Intel 845PE Socket 478 ATX	122.00	103.85
280GPW	PAGE-V/LAN Intel 845GE So478 ATX	121.00	102.98
2FCCPW	P4XP-X Intel 845D Socket 478 ATX	57.00	48.51
28BLPW	P4CBX/Deluxe/GD Intel 845GE So478 ATX	134.47	114.47
2FDDPW	P4SE/Audio S5 645 Socket 478 ATX	47.50	40.43
2FDDPW	P4S533-X S5 645D Socket 478 ATX	57.00	48.51
2FDDPW	P4S533-X/LAN S5 648 Socket 478 ATX	66.00	56.17
2FDDPW	P4S533-MX/LAN S5 651 So478 MATX	56.00	47.66
2H3MPW	A7N266-VM/SE nForce 220D SoA MATX	51.00	43.41
2819PW	A7N8X/Deluxe/GD nForce 2 SoA ATX	118.00	100.43
28BVWP	A7N8X/LAN nForce 2 Socket A ATX	87.50	74.47
180BPW	A7V333/Audio VIA KT333 Socket A ATX	68.00	57.88
2489PW	A7V8X/LAN VIA KT400 Socket A ATX	62.50	53.20
286XPW	A7S333/Audio S5 745 Socket A ATX	53.50	45.54
<b>LEADTEK</b>			
28T6PW	K7NCR18G Pro nVidia nForce2 SoA ATX	100.00	85.11
28T7PW	K7NCR18G nVidia nForce2 SoA ATX	93.50	79.58
28T8PW	K7NCR18D Pro nVidia nForce2 SoA ATX	84.00	71.49
28T9PW	K7NCR18D nVidia nForce2 SoA ATX	75.50	64.26
<b>MICROSTAR</b>			
2H3VPW	875P Neo-FIS2R Intel 875P So478 ATX	159.00	135.32
2H3VPW	865PE Neo2-FIS2R Intel 865PE So478 ATX	129.00	109.79
2H40PW	865PE Neo2-LS Intel 865PE So478 ATX	92.00	78.30
2H41PW	865PE Neo-L Intel 865PE So478 ATX	85.50	72.77
2H42PW	865G Neo2-LS Intel 865G So478 ATX	98.00	83.41
2H43PW	865P Neo-L Intel 865P Socket 478 ATX	82.00	69.79
295VPW	GBN Max-FISR E720S Socket 478 ATX	164.00	139.58
2H44PW	845PE Max3-FISR Intel 845PE So478 ATX	97.00	82.98
2H45PW	845PE Max3-SR Intel 845PE So478 ATX	91.00	77.45
28DCPW	845PE MAX-L Intel 845PE So478 ATX	74.00	62.98
221XPW	845E MAX Intel 845E Socket 478 ATX	63.00	53.62
28DDPW	845GE MAX-L Intel 845GE So478 ATX	80.50	68.51
2FHKPW	655 MAX-FISR S5 655 Socket 478 ATX	123.00	104.69
28TDPW	645 Combo-LS S5 645 Socket 478 ATX	48.50	41.28
2H46PW	651M Combo-LS S5 651 So478 MATX	57.50	48.94
2861PW	648E MAX S5 648 Socket 478 ATX	64.50	54.90
2222PW	M5-6378 VIA KLE133 Socket A MATX	43.00	36.60
2223PW	M5-6378-L VIA KLE133 Socket A MATX	45.00	38.30
28DCPW	KT4 Ultra-FISR VIA KT400 Socket A ATX	105.00	89.37
2869PW	KT4 Ultra-SR VIA KT400 Socket A ATX	84.50	71.92
28THPW	LT4V-L VIA KT400 Socket A ATX	65.00	55.32
2FHNPW	KT3V VIA KT333 Socket A ATX	55.00	46.81
28BDPW	K7N2G-LSR nForce 2 Socket A ATX	114.00	97.03
28BDPW	K7N2G-L nForce 2 Socket A ATX	89.50	76.17
28DLPW	K7N2-L nForce 2 Socket A ATX	73.00	62.13
2FHPWP	746F Ultra-L S5 746 Socket A ATX	61.00	51.92
177DPW	745 Ultra S5 745 Socket A ATX	49.00	41.71
<b>SHUTTLE - BAREBONES</b>			
287RPW	SV25 VIA P4M31T FPCGA	131.00	111.49
287SPW	SS516 S5 651 S478	204.00	173.62
287TPW	S5B15 Intel 845GE S478	235.00	200.00
287WPW	SK41G KM266 Socket A	200.00	170.22
2C8HPW	SN41G2 nForce 2 Socket A	259.00	220.43

### Networking

quicklink	DABSVLUE	inc VAT	ex VAT
16R0PW	10/100 RJ45 PCMCIA	16.00	13.62
14XHPW	5 Port 10/100Mbps	22.00	18.73
14XJWP	8 Port 10/100Mbps	24.00	20.43
1V30PW	16 Port 10/100Mbps	78.00	66.39
1V31PW	10/100 RJ45 PCI	5.00	4.26
28V1PW	10/100 CardBus	15.50	13.20
28V3PW	10/100 USB	19.50	16.60
291WPW	802.11b+ 22Mbps PCI	47.00	40.00
291XPW	802.11b+ 22Mbps PCMCIA	38.00	32.34
178VPW	802.11b 11Mbps PCMCIA	26.50	22.56
178ZPW	802.11b 11Mbps USB	33.00	28.09
1790PW	802.11b 11Mbps PCI	49.50	42.13

### Modems/ADSL

quicklink	DABSVLUE	inc VAT	ex VAT
14X9PW	56k PCI Soft Conexant	8.50	7.24
14XBPW	56k PCI Hardware Voice Intel	9.50	8.09
25BWPW	56k External USB	17.50	14.90
14XFPW	56k External Serial	21.00	17.88
86LPPW	56k PCMCIA	25.50	21.71
28NJPW	ADSL USB + Filter + PSU	30.00	24.54
1777PW	ADSL Conexant Router 1Port	57.00	48.51
1778PW	ADSL Conexant Router 4Port	65.00	55.32
29BDPW	Wireless ADSL Router + Filter	129.00	109.79





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2CCLPW	Intuit QuickBooks 2003 Pro	233.82	199.00
2CWMPW	Intuit QuickBooks XG	57.57	
49.00			
2CWXPW	Intuit QuickBooks XG Advantage/Startup	19.97	17.00
251CPW	MS Money 2003 Standard	29.37	25.00
22YPPW	MS Money 2003 Deluxe Financial Suite	29.37	25.00
17XDPW	Sage Instant Accounts 8.0	104.57	89.00
17XCPW	Sage Instant Accounts 8.0	88.12	75.00
2H9BPW	McAfee TVD Suite 5-user Pack	222.07	189.00
2H9CPW	McAfee TVD Suite 10-user Pack	433.57	369.00
250JPW	McAfee VirusScan 7.0 Home	30.55	26.00
050KPW	McAfee VirusScan Professional 7.0	29.37	25.00
24V1PW	Symantec Norton Antivirus 58 5-user	175.07	149.00
247TPW	Symantec Norton Internet Security 2003	45.82	39.00
13P6PW	Dantz Retrospect Express 5.6	41.12	35.00
28G7PW	Elby Clone CD+CD-R's	29.37	25.00
YR4PW	Roxio GoBack 3.0	28.20	24.00
2488PW	Symantec Norton Ghost 2003	38.77	33.00
2D02PW	AutoCAD LT2004	816.62	695.00
12QTPW	Autodesk Voio View	151.57	129.00
1586PW	Autodesk AutoSketch 8.0	146.87	125.00
2G1QPW	Autodesk AutoCAD LT Standard	64.62	55.00
14LFPW	Laplink Cold 11.0	111.62	95.00
15W6PW	Laplink PC Sync	52.87	45.00
14P4PW	Symantec PC Anywhere H+R 10.5	135.12	115.00
LG9PW	Symantec Norton Internet Security 2003	52.87	45.00
WVDPW	Microsoft Outlook 2002	92.82	79.00
244TPW	Act! 6.0	128.07	109.00
244VPW	Act! 6.0	574.57	489.00
225TPW	Filemaker Pro 6.0	245.57	209.00
WV4PW	MS Access 2002	280.82	239.00
2H01PW	Filemaker Pro 6.0	487.62	415.00
WMPWPW	Visio Standard 2002	151.57	129.00
WMRPW	Visio Professional 2002	351.32	299.00
212HPW	Adobe FrameMaker 7.0	746.12	635.00
13NNPW	Adobe InDesign 2.0	687.37	585.00
X2QPW	Adobe PageMaker 7.0	475.87	405.00
1YV2PW	Adobe Publishing Collection 12.0	927.07	789.00
1YV6PW	Adobe Design Collection 6.0	891.82	759.00
WMNPW	MS Publisher 2002	99.87	85.00
1741PW	Corel WordPerfect 5.0	1433.87	965.00
VS4PW	Adobe Acrobat 5.0	210.32	179.00
2GBJPW	Adobe Acrobat 6.0 Standard	252.62	215.00
2GBKPW	Adobe Acrobat 6.0 Professional	386.57	329.00
113NPW	Adobe Illustrator 10.0	381.87	325.00
17V8PW	Adobe Photoshop 7.0	574.57	489.00
236RPW	Adobe Photoshop Elements 2.0	69.32	59.00
23FMPW	Adobe Premiere 6.5	527.57	449.00
01J1PW	Adobe Type Manager Deluxe 4.1	64.62	55.00
224NPW	Corel Draw 11.0 Graphics Suite	365.07	309.00
28VNPW	JASC Paintshop Shop XE	81.07	69.00
28ZCPW	Macromedia Freehand MX	339.57	289.00
WVFPW	MS Powerpoint 2002	280.82	239.00
24PCPW	UNIVERSITY MICROFILMS/Office	64.62	55.00
209LPW	Corel WordPerfect office 11.0	210.32	179.00
20PPW	Corel WordPerfect Family Edition	57.57	49.00
WJXPW	Office XP Standard	339.57	289.00
WJQPW	Office XP Professional	398.32	339.00
WJYPW	Office XP Standard Upgrade	163.32	139.00
12JLPW	Office XP Student	104.57	89.00
22VSPW	MS Works 7.0	57.57	49.00
22YTPW	MS Works Suite 2003 inc. Word	90.47	77.00
21V9PW	StarStar Office 6.0	45.82	39.00
201MPW	Abbey Fine Reader Pro 6.0	64.62	55.00
23YBPW	ScanSoft OmniPage Pro 12.0	327.82	279.00
21V1PW	ScanSoft OmniPage Pro 11.0	45.82	39.00
P1TPW	MS Windows ME Win 98 Upgrade	81.07	69.00
N29PW	MS Windows ME FULL	146.87	125.00
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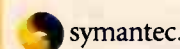
quicklink 247DPW

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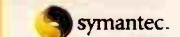
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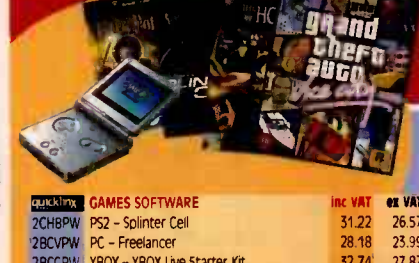
PartitionMagic® helps you resize, create, move, split, merge, undelete, and convert partitions on your hard drive for storing valuable information. Step-by-step wizards allow you to view changes before applying them. Includes BootMagic® which enables you to safely run multiple operating systems on the same computer. Supports Windows® XP, 2000, Me, NT, and 98/95.

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22TKPW	MS Encarta 2003 Premium DVDROM	57.56	48.99
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25H4PW	MS Autocad 2003 Europe	44.65	38.00
2171PW	Route 66 Britain 2003	22.32	19.00
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297VPW	HyperOs2002 R3	116.32	99.00
297WPW	HyperOs2002 R4	175.07	149.00
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257JPW	Nero v5.5 CD Burning + Extras	41.12	32.00
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248BPW	Symantec Norton Ghost 2003	38.77	33.00
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quicklink	SOFTWARE	inc VAT	ex VAT
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2531PW	Symantec SystemWorks 2003	29.37	25.00
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2D35PW	Championship Manager 4	27.02	23.00
2DMSWP	Indiana Jones and the Emperor's Tomb	25.13	21.39
2D5LPW	Devastation	25.08	21.35
2881PW	Vietcong	23.14	19.70
28G9PW	Rainbow Six: Raven Shield	25.02	21.30
2D5KPW	Delta Force: Black Hawk Down	25.08	21.35
282DPW	Impossible Creatures	23.50	20.00
28C7PW	Unreal II: The Awakening	22.73	19.35
25BNPW	Command & Conquer: Generals	28.43	24.20
2880PW	Sim City 4	27.90	23.75
2D5JPW	Highland Warriors	25.08	21.35
2D37PW	Soldier Of Fortune 2 Gold	15.86	13.50
2D34PW	Praetorians	24.68	21.00
27RNPW	TOCA Race Driver	23.18	19.73
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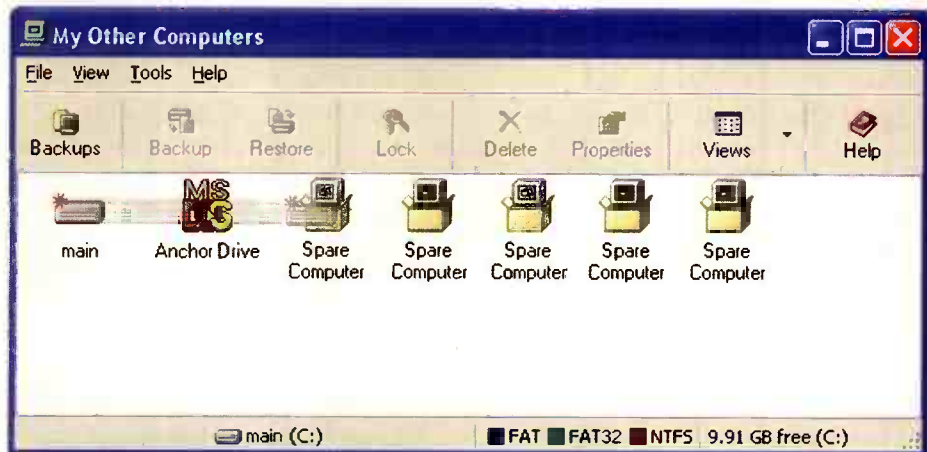
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# HyperOs can convert 1 Windows System into 2 Windows Systems in 5 minutes!

HyperOs clones your existing system with a fast sector copy to a different part of your Hard Disk, then reconfigures your second Windows system to run from this part of your Hard Disk on a new drive letter, and then enables you to swap backwards and forwards between the old and new systems with a double click without altering the way your PC boots at all.



## Why 2 Windows are better than 1 ...



The advantages of having 2 Windows systems on your PC are too numerous to cover in one PC Magazine. But lets make a start and perhaps we'll get the job finished before the world runs out of rain forests.

**1. Windows Crashes don't matter any more.**  
If something goes wrong with your first Windows system, you simply swap to your second with a double click.

**2. Much Faster Performance.**  
Log off XP and then right click the link telling you how many programs are running on any users logon icon. A Microsoft message will appear informing you that the more applications one copy of XP is running the slower it will go. So by splitting your applications between 2 or more XP systems, each system will run faster. The same is true of course for all other versions of Windows.

### 3. Separate Key PC tasks

If your Music software corrupts Windows do you want to lose your ability to send and receive emails as well - we ask rhetorically? Or if your internet software corrupts Windows do you wish to be unable to run your business or do your home accounting? Plainly key tasks should each have their own Windows system. HyperOs makes this practical.

### 4. Give the Internet its own Windows system

The Internet is growing and growing and growing. There are 2.5 billion web pages out there right now. There aren't yet 2.5 billion software applications written to help you navigate around the net, or to protect your PC from viruses, or to send and receive and archive your emails, or just generally to help you really take advantage of this huge World Wide resource, but we are getting there! Surely the time has come to put all Web related software in its own Windows system? HyperOs was designed for this sort of thing.

### 5. Risk free software trials

Everywhere you look there are free 30 day trial software packages. If you install too many of them all into your one and only

**HyperOs Systems Advertisement.**

Windows system, it will crash and your trial will end. The best way to try out a new piece of software is in an experimental Windows system. I mean who marries a girl the minute he meets her (perhaps Russian brides?) Is it not a good idea to see if you get along first? Well things are no different with Software. See if the application does what you want before you risk installing it in your mission critical system.

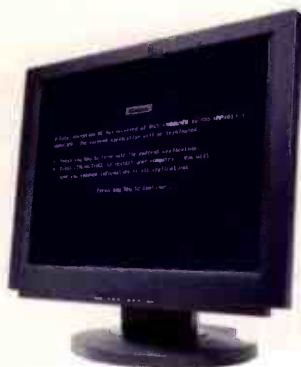
### 6. Solve all Software conflicts

It is true to say that most software applications will work fine in a virgin Windows system. But this does not mean that they will work fine in your Windows system. This is because every PC has its own unique combination of applications and hardware and peripherals, and a further new application may not work with your particular combination. In fact the more applications and drivers that you have installed, the more likely it is that the next application or driver will not install or run properly. The solution is of course to have several Windows systems, then your new wonder application will certainly work in one of them! Or if it is really fussy, you can give it a whole Windows system to itself.

**Call us free on 0800 027 2002**



**7. Quickly determine whether you have a software or a hardware fault**



If one Windows system crashes then swap to the next and see if the same crash occurs again. If it does then it is looking like you have a hardware fault. If it doesn't then you have a software fault in the first system. HyperOs employs a double click fire and forget system swap, so it doesn't take a minute to find where the problem lies.

**8. Who is the Boss in your PC?**

With one Windows system installed, there is no question, Windows is the Boss. With two Windows systems the whole balance of power and of fear of malfunction is shifted. Windows can no longer hold you to ransom. If it plays up, forget it, move on to the next one. In fact, if you have 10 Windows systems installed then you can use them like disposable razors or ball point pens. Use it (via an ultra fast drag and drop image restore) then loose it (by instant systemdeletion).

**9. True Reliability**

HyperOs Systems Labs have carried out extensive trials to determine how many general applications each version of Windows can reasonably safely be expected to run. Our results were as follows:

Windows Operating System	Number of applications it can reasonably reliably run	Maximum Working load at 150MB per application
Windows 98SE	20	3.0GB
Windows ME	15-20	2.25 - 3.0GB
Windows 2000 professional	20	3.0 GB
Windows XP	30-35	4.5 - 5.25GB

We carried out tests on three different PCs, using three different cover disks from PC Plus, PC Advisor and PC Pro. We loaded in 10 then 20 then 30 then 40 then 50 applications from these three cover disks into the three PCs. We ran the Business Winstone 2002 Benchmark test on each PC at each number of applications to see if Windows was able to perform stably. Business Winstone emulates a day in the office, it is a real world Benchmark. We found that Winstone/Windows crashed when the number of applications reached the limits above. Each Windows OS could run all the applications in smaller numbers. Business Winstone is a good real world Benchmark, it gives your PC quite a work out. You may be able to load more applications than the above safely into Windows if you don't intend to have several of them open at once, but why take that risk?

The full technical details of the tests can be found at [www.hyperos2003.com/labs.html](http://www.hyperos2003.com/labs.html)

Our results also verified that the more applications you load it up with, the slower an



Operating System goes. Incidentally 2K was the fastest, and XP could carry the most load as the table above shows. So if you wish your PC to actually use more than 10% of a modern hard 80GB disk for software then you need more than one Windows System.

**10. Take advantage of all the great software you like**

Many consumers falsely believe that you can do this with any PC, but generally you can't. If your PC only has one Windows system installed and if you have a multi dimensional interest in life then you are going to run out of application space. However if you have several Windows systems, then you can try out as many new applications as your imagination desires and as your many Windows systems permit.

What is the purpose of having a computer and being able to run no more than 20 of the thousands of available applications on it? The IBM PC dominates the MAC we are told,



because of the enormous diversity of software applications that are available to it. But if you can only run 20 of these applications on your IBM PC, then have you not defeated the main advantage of going the Microsoft route in the first place?

HyperOs Multi Windows Products	Windows 95 & 98	Windows Me, NT, 2000 & XP	PartitionMagic included	Old system + up to 10 new systems	Old system + up to 20 new systems	RAM HyperDrive	RRP (Ex PP and VAT)
HyperOs 2003 R2	●		8.0	●		95,98	£99.00
HyperOs 2003 R3	●	●	8.0	●			£99.00
HyperOs 2003 R4	●	●	8.0	●		95,98,Me	£149.00
HyperOs 2003 R5	●	●	8.0		●		£149.00
HyperOs 2003 R6	●	●	8.0		●	95,98,Me	£199.00

# HyperOs can convert one Windows XP system into 10 Windows XP systems in 14 minutes.

## HyperOs can convert one Windows 98SE system into 10 Windows 98SE systems in 5 minutes.

**HyperOs can run up to 21 Windows XP systems on one Hard Disk, without Multibooting, without Virtual PCs, and without Hiding any partitions.**

**Or If you prefer, these 21 systems can be any mixture you like of Windows 95osr2, 98, 98SE, Me, NT, NTServer, 2000, 2000Server, XP or 2003.**

Now that is real computational power. One Windows system is totally lame in comparison to the power, the flexibility and the capability of a HyperOs Multi Windows machine.

One Windows System can no longer handle the huge number of software applications that are available today.

13 years ago, in 1990, when Windows 3.0 first came out, there were only a handful of decent Windows applications available. At that time perhaps one Windows system was sufficient. But today there are thousands and thousands of interesting Windows applications on offer, so one Windows system is plainly inadequate as a means of experiencing even a small sample of them. No one wants to share a one room apartment with 25 other people. So why install your mission critical applications and your mission critical device drivers together with all your non mission critical device drivers and all your internet applications and all your games and all your office applications and all your educational applications and all your music applications and all your video applications into one copy of Windows?

Really, there is no need to live in such computational squalor!

It is well known that the more applications you load into Windows the slower it goes, the more difficult it is to find anything and the

more likely it is to crash. But there is a very simple fix for this. Just add a second Windows system and you have a two roomed apartment, or better still, add another 9 Windows systems and you have a 10 roomed mansion. Now you are living in Beverly Hills.

You can spread your software load, you can avoid device driver conflicts, you can avoid software conflicts. You can run 5 different sound cards if you like, or 5 different network cards, in one PC. You just load the device drivers for the devices you need in each separate Windows system.

In the past, Multi Windows systems have mainly been virtual PC environments or Multi Booting environments with multiple hidden primary partitions. But thankfully these days can now end.

HyperOs boots your PC as normal from one Primary bootable partition, your regular C: drive. It boots just like a normal single Windows PC boots. Then it takes over the boot process and redirects your PC to run any one of up to 20 other Windows systems which are installed as normal in Logical partitions with drive letters E to X all of which can be on the same Hard Drive if you like. HyperOs keeps drive D for itself.

HyperOs also incorporates what we understand to be the World's fastest sector copy program, which can backup/restore/copy/paste/image/clone Windows Systems at around 1GB per minute on a modern ATA100 Hard Disk.

**So HyperOs can back up NT in around 7 seconds and XP in around 70 seconds.**

HyperOs can copy any Windows system on your PC to any drive letter between E and X and then reconfigure that system automatically to run from that new drive letter. The copy is made by a simple drag and drop in the 'My Other Computers' Window that HyperOs provides. You simply drag the icon for the E drive (for example) to the icon for the F drive (for example), and another Windows System is born.

You can also back up and restore whole Windows systems with a simple drag and drop. So with one image of XP, you can create 10 Windows systems in around 14 minutes (at 1GB per minute) allowing for drag and drop time, and 20 Windows systems in around 28 minutes, just by performing 10 or 20 drag and drop operations.

This is all possible because HyperOs manipulates one real Windows system from another real Windows system, rather than from a DOS boot disk as in the case of the famous Norton Ghost. Using the Windows environment for Windows system manipulations means that you can drag and drop whole Windows systems as if they were single files. It is wild.



# System Doubler

**This is how you convert a 1 Windows PC into a 2 Windows PC without re-installing Windows.**

1. Install HyperOs
2. Open PartitionMagic 8.0 integrated into HyperOs
3. Shrink your C: drive partition and create a D: drive partition and an E: drive partition
4. Restart Windows open My Other Computers and drag the C: drive icon over to the E: drive icon.



Now you have two Windows systems. You have a backup system, you have an experimental system, you have doubled your software carrying capability, you have actually doubled the capabilities of your PC.

HyperOs Multi Windows Products	Windows 95 & 98	Windows Me, NT, 2000 & XP	PartitionMagic included	Old system + up to 10 new systems	Old system + up to 20 new systems	RAM HyperDrive	RRP (Ex PP and VAT)
HyperOs 2003 R2	●		8.0	●		95,98	£99.00
HyperOs 2003 R3	●	●	8.0	●			£99.00
HyperOs 2003 R4	●	●	8.0	●		95,98,Me	£149.00
HyperOs 2003 R5	●	●	8.0		●		£149.00
HyperOs 2003 R6	●	●	8.0		●	95,98,Me	£199.00

# HyperOs vs. Multibooting vs. Virtual PCs



Traditional multiboot systems work by creating primary partitions and installing a copy of each OS in each bootable partition.

Then when you boot the PC you get a boot interrupt menu, which gives you the option to choose one of your bootable partitions by hiding all of the others.

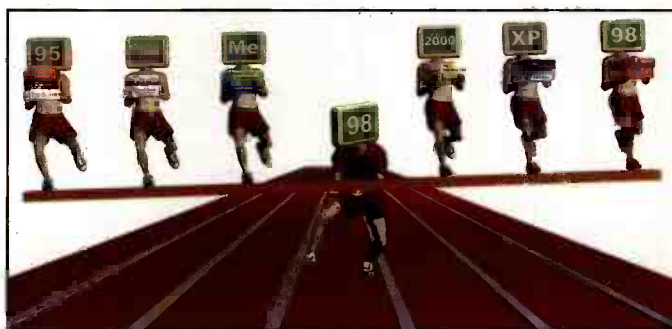
This method means: -

- 1) You can only ever access one of your systems, all other systems are hidden.
- 2) You cannot backup, restore or delete or fix one Windows system from another, you have to use a boot disk.
- 3) You cannot clone Windows systems.
- 4) You cannot move a Windows system from one partition to another and then run it on the new partition.
- 5) You have to install each copy of each OS that you wish to run.
- 6) You can only run an OS (except OS2, Linux, NT4, 2K and XP) from a primary partition.
- 7) You can only have 1,2 or 4 primary partitions per disk (depending on your BIOS). So you can only have 1,2, or 4 OS's per hard disk.

Virtual PC systems run your applications on one client Windows system which shares system RAM and CPU time with other client Windows systems. All of which run on emulated hardware, all of which runs on a host Windows system.

This method means: -

- 1) You can only run a virtual Windows environment on emulated hardware not a real Windows environment on real hardware.
- 2) You can only use a fraction of your PC's resources for any Windows system, so performance is drastically reduced.
- 3) You cannot be sure that any conclusion reached on a virtual Windows platform will be applicable to a real Windows platform.
- 4) Running several Windows on top of each other all competing for limited PC resources, is going to be less stable than running 1 Windows which gets all your PC's resources.



HyperOs 2003 works by creating only one bootable partition, your C: drive. It then redirects your PC to the OS you wish to run. You choose this OS from a windows icon called "My Other Computers".

This method means: -



- 1) You can access all of your systems, none are hidden.
- 2) You can backup, restore, copy, paste, image, clone, delete, fix, zip or unzip whole Windows systems from Windows. No need to use a boot disk. This means you can reinstall Windows XP from an image file in 60 seconds, rather than 60 minutes.
- 3) You can drag and drop whole Windows systems on to drives to clone, them and then run them from that drive.
- 4) You can move whole Windows systems from one disk to another or from one partition to another by dragging and dropping them within 'My Other Computers'.
- 5) When you boot your PC it will return to the last system used without a boot interrupt menu.
- 6) To change systems just double click the relevant icon in 'My Other Computers'.
- 7) Once you have installed one copy of any version of Windows, you can copy it to any other partition on any hard disk on your PC and HyperOs will run it.
- 8) You can run 95OSR2, 98, Me, NT, 2000, or XP from a logical partition.
- 9) You can have up to 21 operating systems on 1 hard disk.





# Run 1 more or up to 20 more real Windows systems on your existing hardware

without multibooting, without hiding partitions, without virtual PCs

All Trade Marks Acknowledged. (c.&o.e)



## Spread the load with HyperOs

### Fastest Windows Performance

PC's slow down dramatically the more applications you load into them. But if you spread the load between systems they speed up and they become more stable.

Try out new software without risking or overloading your mission critical system.

Load any or all versions of Windows and HyperOs will just run them. Each OS can see all the other OS's and all of your data. No other software can do this.

## Don't Overload with OneOs

### Recover From Any Crash

Don't put all your eggs in one basket. Get up to 20 more baskets and effectively make your PC indestructible with HyperOs.

Backup and restore whole Windows systems in less than a minute with a drag and a drop using HyperOs Spirit, the world's-fastest sector copier.

HyperOs swaps systems without multibooting, via a fire and forget double click. People still find this hard to believe until they try it.

**HyperOs Systems**

	Windows 95* & 98	Windows Me, NT, 2000 & XP	PartitionMagic included	Run up to 10 more systems	Run up to 20 more systems	HyperDrive (95* 98 & Me)	RRP (+vat and P&P)
HyperOs 2003 R2	●		8.0	●		95*, 98 only	£99.00
HyperOs 2003 R3	●	●	8.0	●			£99.00
HyperOs 2003 R4	●	●	8.0	●		●	£149.00
HyperOs 2003 R5	●	●	8.0		●		£149.00
HyperOs 2003 R6	●	●	8.0		●	●	£199.00

\* 95 OSR2



# Are you still Running Windows from a Hard Disk ?

Get HyperOs 2003, R2, R4 or R6 and run Windows 95\*, 98 and Me from a RAM HyperDrive as well



HyperOs 2003 is covered by 4 patent applications

## Lightspeed Performance

RAM, being a solid state device, can transfer data at the speed of light, 300,000,000 metres per second. Your hard disk, being a mechanical device, is limited to around 7200 rpm.

The Business Winstone Benchmark runs around 25% faster and Microsoft Access runs up to 100% faster in HyperDrive mode on an Athlon machine.

The HyperDrive gives you an 'instant desktop'. Applications will open and close almost instantly. Photoshop 7 opens in just 3 or 4 seconds rather than 10 or 20 in hard disk mode.

## Risk Free HyperDrive Surfing

Experience Internet surfing in HyperDrive mode. HyperOs automatically discards surfing history, localised viruses, cookies, unwanted taskbar additions and home page relocations when you switch systems.

HyperOs r3, r4, r5 and r6 give FAT32 capabilities to NT and restore true DOS to Me. All versions can also configure 95\* so that it can run on all the latest P4/Athlon machines. For a full technical specification, FAQ's, and the history of HyperOs please visit [www.hyperos2003.com](http://www.hyperos2003.com)

# Call us free 0800 027 2002

The HyperOs manual provides a wizard assisted step by step guide to installing every version of Windows.

Also exclusively available at..

**SIMPLY**  
www.simply.co.uk

**MISCO**  
www.misco.co.uk

**GLOBALdirect**  
www.globaldirect.co.uk

**QBS**  
SOFTWARE

www.qbssoftware.com

**dabs**  
com

www.dabs.com/hyperos

**TRUSTMARQUE**  
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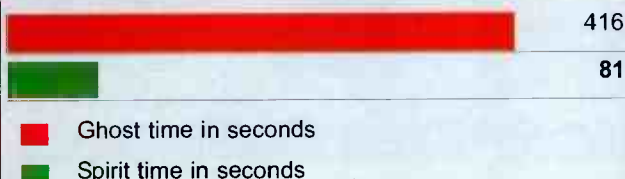
www.trustmarquesolutions.com

HyperOs Systems

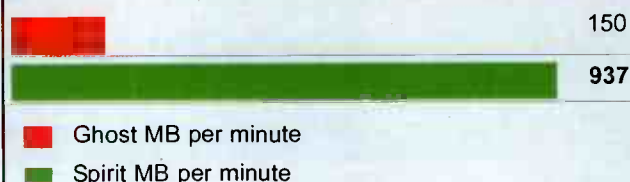


# "HyperOs Splrit comes out 5X faster then Norton Ghost"

Time taken to backup a 1.21GB FAT16 Windows XP



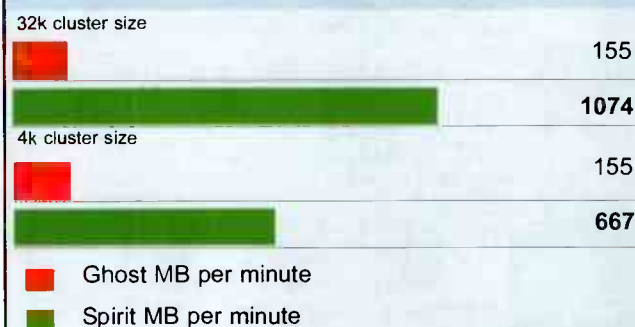
Speed of backup for a 1.21GB FAT16 Windows XP



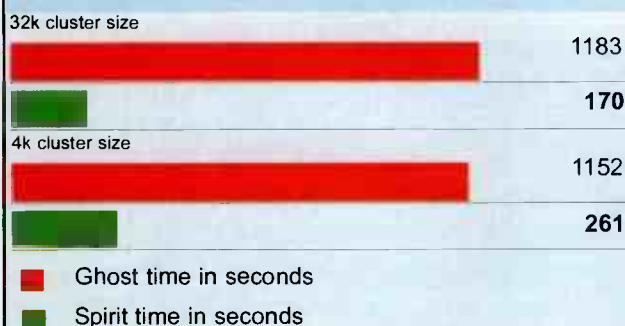
Time taken to backup a 1.52GB FAT32 Windows Me



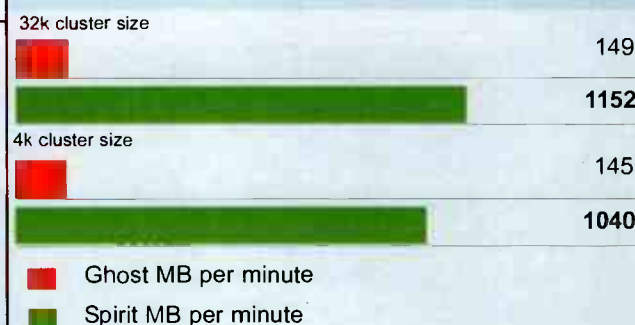
Speed of backup for a 1.52GB FAT32 Windows Me



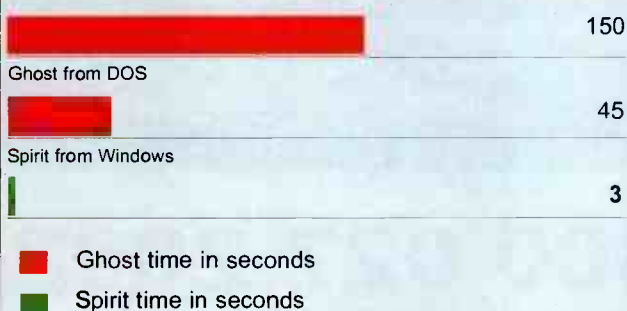
Time taken to backup a 2.86GB FAT32 Windows Me



Speed of backup for a 2.86GB FAT32 Windows Me



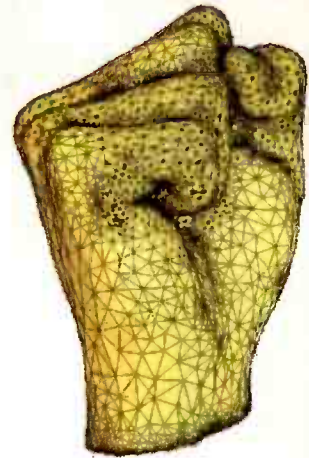
Software setup times for backing up



## The results examined

The test machine for the Ghost vs. Spirit contest was an Advent machine purchased from PC World 2 years ago. It had an Athlon 550MHz CPU and 64MB of RAM running on the AMD 751 Southbridge and 756 Northbridge. We used the latest Bus Master IDE drivers for the Southbridge, which were available from the AMD website. With larger partitions, Ghost stops after backing up 2047MB (this is the 2GB DOS file size limit). You either have to watch the whole process and immediately start it off again, or as is more often the case, you will lose a few minutes before you realise that it has stopped and therefore restart it. Spirit does not have this problem, because it runs in Windows rather than DOS. Spirit performs over 4 times faster than Ghost with a small cluster size partition, and over 6 times faster than Ghost with a large cluster size partition.

# HyperOs Spirits drag and drop capabilities brings system backups within the grasp of the home user



Let us face it. Most PC users cannot be bothered to back up Windows using the traditional Norton Ghost software. This is why Microsoft are indefinitely introducing improved automatic backup solutions for Windows such as System Restore. This is because people in general don't back up their systems with standard backup software often enough. This is why System Restore is billed as an XP top 10 feature.

The reason that one does not back up Windows regularly is that the typical system with System Restore and Hibernate and the paging file and some data on one drive might be 3GB in size. And all industry backup software runs in DOS in PIO mode at a maximum of 100MB per minute. So we are talking about 30 minutes to back up a normal Windows system. And the user has to reboot to DOS and then use a DOS interface to set the backup going.

## HyperOs can do this job in 90 seconds and this is how:



Firstly with HyperOs there is always another Windows system available to backup your first system with. So that rather than your hard disk operating in PIO mode in DOS it is operating in UMDA 4 or 5 mode in Windows.

Secondly HyperOs backs up systems using HyperOs Spirit, which employs an

intermediate RAM buffer, and an algorithm which reads data from the source drive in 6.4 MB chunks into RAM, in such a way that it can be written out linearly to the target drive. In this way write times are much speeded up, because the writing head does not have to jump around all over the disk. HyperOs spirit will back up and restore data at around 1000 MB per minute on an IBM120GXP hard disk (which is a very fast IDE hard disk - a fantastic piece of IBM technology).

Thirdly, HyperOs disables Hibernate and System Restore, because the former is incredibly space inefficient (taking 12% of your hard disk space or more if it can get it), and is only useful with a very slow to start up and overloaded Windows. Also because the latter is performed better by the very process we are currently describing.

Fourthly, HyperOs setup moves your swap file and paging file to the C: drive. There is no need to back up these huge files, when you back up Windows. Windows will recreate them when you restore it. So what was a 3GB system on a one Windows PC will be between a 1GB and 2GB system on a HyperOs multi Windows PC (because your paging file/swap file and your hibernate file and your system restore folder generally take up more than 1GB between them).

So Spirit can back it up in between 1 and 2 minutes of typically in 90 seconds. As regards to NT, since it only takes up 120 MB when configured as above, for HyperOs, it will get backed up in 7 seconds at 1000 MB per minute. So it is not an exaggeration to say that what other backup and restore packages do in 30 minutes, HyperOs Spirit does in 90 seconds. This differential

applies on all typical consumer PCs where the hard disk runs off the motherboard IDE socket. PCs with RAID and other fast SCSI hard disk controller will perform better in DOS and so the difference will not be so marked.

But that is not the best bit. The best bit, is that to back up a system with HyperOs, all you do is drag the system icon to the backups window of HyperOs's My Other Computers window and drop it there. It is a drag and a drop, that is it.

The difference between a 30 minute backup setup by an excursion into DOS perhaps after booting from a floppy disk, and a 90 second backup setup by a drag and drop from within Windows is monumental. This is one of the huge advantages of HyperOs over Multi Booting or Virtual PC software. With HyperOs, you can manipulate one Windows system from another Windows system. With Multi Booting you cannot even see any other Windows systems, and with Virtual PC software you can see them but you cannot access their data due to virtualisation and due to the fact that all these systems are being used at once.



HyperOs Systems Advertisement.

Call us free on 0800 027 2002

HyperOs Systems



# The HyperDrive - running Windows entirely In RAM

HyperOs 2003 does not require any extra RAM to be installed on your PC unless you intend to use it to run Windows in RAM. If you are going to run Windows in RAM then you will need 768MB of RAM to do it. But, if you intend to use HyperOs to run several Windows systems on your hard disk, then obviously you will not need any more RAM than the normal requirements for Windows (64MB / 128MB) to do it.

Most operations in a modern PC happen in silicon. In silicon there are no moving parts. Silicon transistors which control and store data can change their state (from 0 to 1) over 1 billion times in one second. But incredibly, all of the data which these transistors work on, is taken from and returned to a rotational mechanical device which whirls round and round at 7200rpm.

The hard disk is an obvious bottleneck in PC performance. If this article was merely a couple of paragraphs long we would say something like:

**“Electronic devices can transfer information at the speed of light, which is 300,000,000 metres per second, whereas your hard disk is a rotational mechanical device which moves data around at between 5,400 and 10,000rpm”**

But this is only a part of the hard disk dilemma. The imbalance in performance between RAM and a hard disk is actually far worse than what one might expect from their differing physical constitutions. This is because the hard disk controller, which is the interface between your disk and your PCI Bus, is often more of a bottleneck even than the hard disk itself. Truly, the hard disk controller is one of the unsung heroes or villains of PC performance. When you buy an ATA100 hard disk, and more laughably when you buy an 'ATA133' hard disk, you can easily

be fooled into believing that it will read and write data at 100MB per second or even at 133MB per second. But just try and read or write 100MB of information, say from a 100MB file, you will discover that it will not take one second. Typical data transfer rates vary from 2MB per second to 50MB per second depending on your ATA100 drivers, your Southbridge and your hard disk controller.

If you have no ATA100 drivers, then the hard disk will operate in PIO mode, rather than UDMA mode, and it will transfer data at between 2MB and 8MB per minute (which is not much faster than a CD). If you have a portable PC, then since there is no portable motherboard with a UDMA 5 compatible Southbridge as yet, you will be transferring data at a maximum of around 20MB per minute, even with the best possible ATA100 drivers, and with a UDMA 5 hard disk (which will be operating in UDMA 4 mode). If you have a Pentium IV motherboard with the latest SiS Southbridge, then you may see data transfer rates in excess of 40MB per second from your ATA100 hard disk, which is not what you might hope for but is nonetheless a creditable effort.

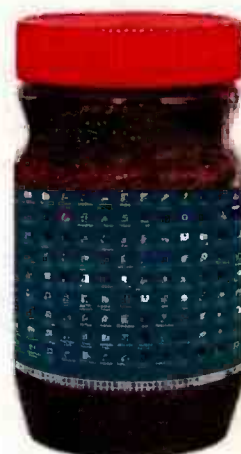
However, all of this pales into insignificance when compared with the IO which is achievable from a RAM disk. HyperOs employs a real mode 16 bit RAMdisk, which we call a HyperDrive. With one of these, even if you are simply using plain old 100MHz SDRAM, you can transfer data at 200MB per second (100 million chunks of 16 bits, which is 2 bytes, every second).

If you are using 266MHz DDRAM, in a RAM Hyperdrive, then your transfer rate will be 532MB per second. What this means is that every application that you double click could theoretically open 10 times faster on the HyperDrive than it does on the fastest consumer hard disks available today. In fact due to timing limitations in software, Windows itself will start up around twice as quickly, and applications will open between 3 and 5 times faster.



## Instant Desktop

The effect is that you feel like you have an instant desktop. If you look for files on a RAM disk, you will find them instantly. There is no benchmark that we know of that measures this "clicking around the desktop time". Yet if you use a PC for more than an hour a day at work, then this really is the time that needs to be reduced. By drastically reducing the time it takes for every Window of every application on your PC to open or close, you save yourself huge amounts of real user time. Benchmarks generally measure execution time, which is how long it takes *your PC* to run an application. They do not measure desktop time, which is how long it takes *you personally* to set up the application. The RAM HyperDrive reduces the time that it takes you to do things on a PC. This is often more important than reducing the time it takes your PC to run an application, because while it is running an application, you can be taking a phone call or setting up something else on your PC.



## The HyperDrive rewrites history giving you total crash recovery



When HyperOs swaps to HyperDrive mode, it first sector copies the relevant hard disk partition (732MB maximum data size) onto the RAM HyperDrive (at speeds of up to 1900MB per minute). Then, it runs this copy of Windows and its applications from RAM. If, during your session in HyperDrive mode Windows crashes, then you have only corrupted the copy of Windows on the HyperDrive, you have not altered the copy on the hard disk. So, if you then swap back to hard disk mode, or exit HyperDrive mode and then reboot back into HyperDrive mode, the PC will have no knowledge of the crash and things will continue as if the crash had never occurred. You will have effectively rewritten history. As a result, the HyperDrive gives you an indefinite number of opportunities to screw up with impunity! This is heaven for experimenters.

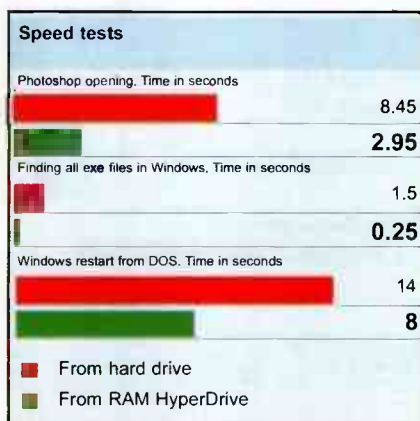
## Surf the net in HyperDrive mode

The first time you surf in HyperDrive mode with a 56K modem, that is with all of Windows and Internet Explorer or Netscape or AOL in RAM, you feel like you are surfing with Broadband. Various windows open and close so fast it is like there is no one else on the Net! But the advantages do not stop there. Any change to your system is discarded at the end of the session. So, if the Net takes over your machine and starts bouncing you around different websites, and filling your Windows system with cookies and unwanted favourites, or messing around with your home page, you are immune. Reboot, and things return to exactly the way they were before the session. Every change is lost when you exit HyperDrive mode unless, of course, you choose to save certain files that you have downloaded on to your hard disk, instead of leaving them on the desktop in RAM.



## HyperOs for hardware and software reviewers, software designers, web developers and IT testers.

### RAM HyperDrive vs hard drive



### The results examined

The test system used was an Athlon XP1800+ on an Abit KG7 motherboard, 80GB 120GXP IBM HDD with 1024MB DDR RAM, GeForce3 and TX2 Promise controller.

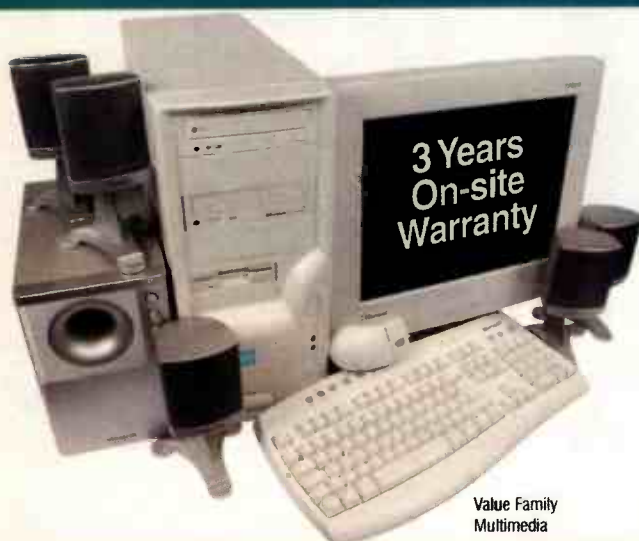
We used the fastest hard IDE disk we know of, we used the fastest SCSI performance IDE hard disk controller we know of, and the HyperDrive still blew it away convincingly! Need we say more?

If you spend a significant part of your day clicking around your desktop, then the HyperDrive will make all the difference.

One Windows in these circumstances is again pretty much a no-brainer. If you are testing 10 graphics cards, each of which will have its own drivers, then you really need to install each driver for each graphics card into a new copy of Windows. If you do not do this, then you cannot be sure that bits of the drivers used to test your earlier graphics cards are not still lying around and conflicting with the new drivers being used to test your later graphics cards. HyperOs Systems recently supplied HyperOs 2003 release 6 to Computer Shopper Labs for just this purpose. In the past, their hard working engineers have had to reinstall Windows a dozen times to do the group test. But now, with HyperOs, they install Windows once, and back it up in around one minute. Then, they can either make as many copies of it as they want for the test, or they can simply keep restoring a clean image (again in around 60 seconds) before each new test. Big web design firms such as Rufus Leonard of Clerkenwell (an early customer of HyperOs) can gain huge benefits from multi Windows systems. Rufus Leonard used to have 20 PC's all of which ran different versions of different web browsers. These PC's were used to test website appearance and performance on every conceivable platform. With HyperOs, the whole test of all 20 browser types can be done on one PC, so that hardware differences can be eliminated from the equation, and the testing engineers can multiply their productivity, whilst decimating their hardware bill and freeing up some desk space as well!



# Faster Performance Same Great Quality



Value Family  
Multimedia

## Choose Quality

At holly, we believe a PC should perform to the highest standards, be upgradable and totally reliable. This is why we choose only the best components, from the world's leading manufacturers. And for total peace of mind, we back it up with a 3 year on-site warranty.

## Choose the PC which is right for you

Most manufacturers try to sell you what they have in stock – not necessarily what you want.

At holly, our experienced team of sales advisors will take time to understand your needs and talk you through the choices available –

ensuring you get a PC which is exactly right for you. We can do this because we build every PC to order, allowing us to incorporate the latest products, at the best prices and built to your exact specification.

If you know what you want, you can design your own PC, using our easy to use configurator, at [www.hollycomputers.co.uk](http://www.hollycomputers.co.uk). We offer huge selection of quality brand name components and the latest technology.

**holly**  
customise... not compromise

## Value Family Multimedia HyperOs Multi-PC 5x

Case	Simplicity Tower 4x 5.24 & 2x 3.5 Quick Release Bays, Front USB
Processor	AMD* Athlon* 2200+ XP (1.80GHz) 266MHz QuantiSpeed
Motherboard	Gigabyte GA 7VAX, 8x AGP, ATA133 USB2.0 LAN
Memory	256MB PC2700 DDR333
Hard Drive	80GB Hitachi/IBM Deskstar 7200rpm 2MB Cache 8.5ms
CDRW	Lite-On CD-R/RW Drive 52x24x52x, Smart Burn/X, Nero
DVD	NEC 16x48x DV-5800B DVD-ROM
Graphics	64MB Gainward GeForce 4 PowerPack Pro 600, MX440, 5ns DDR TV
Sound	Onboard 6 Channel AC97 Audio
Monitor	17" Philips 107T .25dp Real Flat, 1024x768@85Hz, LightFrame3
Software	<b>HyperOs Multi-PC software 5x</b> , Windows* XP Home, Sun Star Office, Cyberlink PowerDVD, Recovery System
Warranty	3 year On-site



The benefits of this HyperOs Multi-PC and the enhanced value to family users are easily identified; **everyone can have their own Windows environment** without affecting one another. Today's large hard disks can easily be preconfigured to accommodate a Windows PC for every member of the family and if someone has a problem no one else has to suffer. Recovering from the problems of a multi-user PC are a thing of the past with HyperOs.

**£648<sup>.60</sup>** ex.vat **£762<sup>.10</sup>** inc.vat

**holly & HyperOs Systems**

## Performance Gamer HyperOs Multi-PC 8x

Case	Simplicity Tower 4x 5.24 & 2x 3.5 Quick Release Bays, Front USB
Processor	AMD* Athlon* 2500+ XP (1.83GHz) 333MHz QuantiSpeed
Motherboard	EpoX 8RDA+ Athlon nForce2, 8x AGP, 6 PCI, ATA133, 6x USB2, 2x IEEE 1394 Firewire, Dolby Digital Surround Audio, LAN
Memory	512MB PC2700 DDR333
Hard Drive	120GB Hitachi/IBM Deskstar 180GXP ATA100 7200rpm 8MB Cache 8.5ms
CDRW	Lite-On CD-R/RW Drive 52x24x52x, Smart Burn/X, Nero
DVD	NEC 16x48x DV-5800B DVD-ROM
Graphics	128MB ATI Radeon 9700 PRO DDR DVI TV
Sound	Pure Digital VideoLogic Sonic Xplosion DVD
Monitor	17" iiyama Vision Master Pro 1600x1200@75Hz
Software	<b>HyperOs Multi-PC software 8x</b> , Windows* XP Home, Sun Star Office, Cyberlink PowerDVD, Recovery System
Warranty	3 year On-site



If you're passionate about gaming then this PC is perfect. The raw power of the **AMD Athlon 2500+** together with the **ATI Radeon 9700 Pro** are further enhanced by the HyperOs Environment. You can literally enjoy multiple PCs in one and configure them around your specific software and gaming requirements.

Play safely in one Windows and test in another, easily configure independent Windows versions without the need for multiple installation, check driver updates and stability. Take full advantage of **HyperDrive for Windows 9x** editions and load the whole system into memory.

The advantages of HyperOs are almost limitless to the PC gamer and the ultra fast drag and drop backup routines mean you can solve life's little problems without losing your data.

**£1042<sup>.55</sup>** ex.vat **£1225** inc.vat

**holly & HyperOs Systems**

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email: [sales@hollycomputers.co.uk](mailto:sales@hollycomputers.co.uk) fax: 01375 397221



# One Windows System is not enough!

## HyperOs software solutions

Partnering with HyperOs Systems, holly is now able to let your PC reach new levels of performance. Every PC shown can be customised with HyperOs Spirit the ultra fast drag and drop system software solution. With HyperOs software pre-installed your PC suddenly becomes a Multi Windows PC.

So what does this mean? By spreading your software application load you will immediately notice a significant increase in performance and stability. You can try out new applications first in a test Windows system without risking your mission critical Windows system. If for some reason one Windows system fails, you just swap to the next and continue to send and

receive emails, surf the net and work on your documents. Let our experienced team of sales advisors help choose the HyperOs solution that's best for you.

## HyperOs 2003

### Ultimate Executive HyperOs Multi-PC 10x

Case	Simplicity Black Aluminium Midi Tower, 6x External Quick Release & 4x Hidden Bays, Front USB & IEEE 1394
Processor	Intel®Pentium®4 3.06 GHz PGA-478, System Bus 800MHz, 512KB L2-Cache, HT Technology
Motherboard	Asus P4C800 Deluxe Intel 875 (Canterwood) FSB 800MHz, DDR400, Multi RAID, Gigabit LAN, 2 x IEEE 1394, 4 x SATA, AC97 6 Ch Audio
Memory	1GB (2x512MB) PC3200 DDR400
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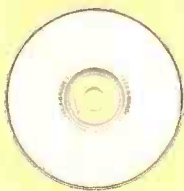
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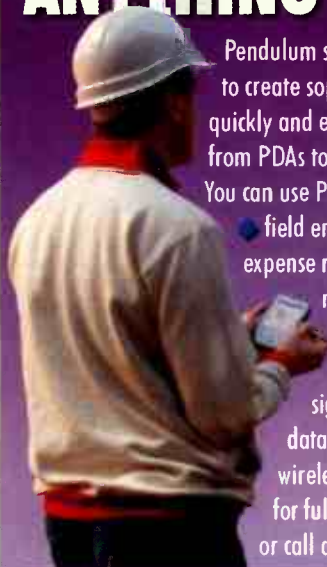
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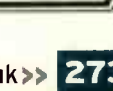
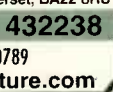
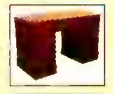
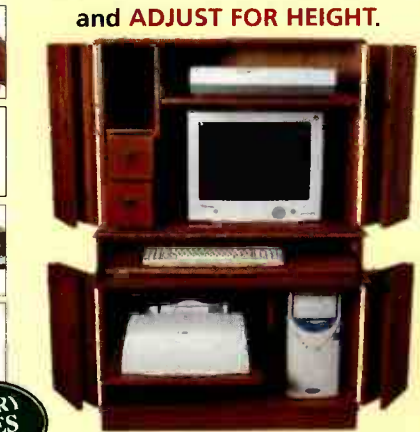
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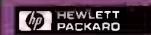
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T018401	Epson Stylus Color 680	3-Colour	£16.59	£6.49	£17.99
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BC61	Colour Ink Cartridge	£23.49
BC62e	Photo Ink Cartridge	£37.49
BCI21Bk	Black Ink Tank	£4.89
BCI21C	Colour Ink Tank	£11.69
BCI24Bk	Black Ink Tank	£4.79
BCI24C	Colour Ink Tank	£9.99
BCI3eBk	Black Ink Tank	£7.69
BCI3e	Cyan, Magenta, Yellow	£6.09
BCI3ePBK	Photo Black Ink Tank	£6.39
BCI3ePM	Photo Magenta Ink Tank	£6.19
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S041332	A4 251gsm Premium Semigloss Photo Paper (20)	£10.89
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BC02 Black	BJ200/220e/220e/220ex/230/BJC150/210/240/250/1000	£ 9.35	£ 8.23	
BC05 Colour	BJC150/210/240/250/1000	£12.75	£10.99	
BC06 Photo	BJC240/BJC250/BJC1000	£13.75	Top Up Kits refill carts up to 3 times	
BC20 Black	BJC2000/2100/2110/4000/4100/4200/4300/4400/4550/4650/5000/5500	£11.99		
BX02 Black	FAX B320/3410	£ 9.99		
BX03 Black	FAX B100/110/MP10	£ 9.99		
BJC4000 Twin	2000/4000/5000 (BC121B & BC121C)	£ 4.39		
BJC3000/6000 Black		£ 4.49		
BJC3000/6000 Each Individual Colour		£ 4.49		

### HP Compatibles

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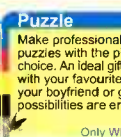
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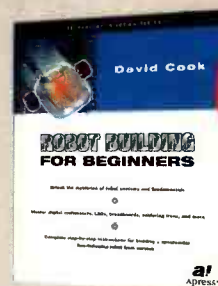
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# Leisure

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## Freelancer

In space, no one can cheer your screen as you explore new worlds



You can fly on auto-pilot, or you can use the mouse to select a point in space and the ship will follow the cursor as you steer towards it – you use the spacebar to toggle between the two modes. There's no need for a joystick and you don't need to pound the keyboard.

Similarly, it is simple to move around space stations to visit equipment dealers, commodity traders and ship dealers, or simply to drink in the bars.

Freelancer is all about flying your ship, shooting up the enemy, taking contraband and then doing it all over again. The graphics look superb and the game flows very smoothly. But, most importantly, Freelancer is just great fun.

Leo Waldock

### LOADING...



### Pocket rocket

Just in case you thought handheld gaming was only for kids, Nintendo has come up with the Gameboy Advance SP to change your mind. The two-year-old, 32bit handheld has undergone a radical redesign. For starters there's the screen, which – thanks to an integrated screen light – is much brighter than the original GBAs. Coupled with its 82 x 84.6 x 24.3mm dimensions and 143g weight, the SP should fit most pockets, while its brushed metallic finish in silver, black or blue means it won't be out of place next to a laptop or PDA.

Perhaps the biggest innovation is the built-in rechargeable Lithium Ion battery which, it's claimed, allows for up to 18 hours gaming with the screenlight off.

If you have £85 to spare and a lot of time on long journeys to kill, then the SP has to be one of this year's must-have gadgets.

[www.nintendo-europe.com](http://www.nintendo-europe.com)

Digital Anvil, now a Microsoft company, spent four years developing Freelancer, so our expectations were high. Set in the 30th Century, you play the character of Edison Trent, a freelance space pilot from the planet Leeds in the House of Bretonia. The game opens with a fleet of raiders destroying the neutral space station Freeport 7, and while Trent manages to escape with his life, he loses his ship, his cargo and his money.

Throughout the game there's a tentative story line as you try to find out who the raiders were, but that's just an excuse to fly space ships, do deals and shoot people.

You arrive on Planet Manhattan looking to earn some money, and that's when the game gets interesting. It's non-linear, which means that you can play one of a variety of characters (smuggler, naval officer, space thug or trader) and you aren't tied to following a specific path. If you spend all your time trying to find out why Freeport 7 was destroyed you'll successfully complete the game, but will have missed out on visiting a large part of galaxy.

There are 48 star systems in all, including an industrial system called Leeds, a sophisticated system called Manhattan, a holiday resort called Malta and rainy New London. The Ice system of Tau 31 shows more imagination.

The game play is excellent and it is clear that a huge amount of development has gone into the interface, which consists of a head-up display and the control keys. Flying a spacecraft simulator can be very hard work, but Freelancer uses a very elegant system so you never have to handle too many options at once. The best example is flight control.

Freelancer lets you fly through space, do deals and shoot things

### DETAILS

**PRICE** £34.99 inc VAT

**CONTACT** Microsoft

0870 601 0100

[www.microsoft.com/games/freelancer](http://www.microsoft.com/games/freelancer)

#### SYSTEM REQUIREMENTS

600MHz Pentium III, 128MB of Ram, 16MB graphics, 900MB of hard disk space, Windows 98/ME/2000/XP

#### VERDICT

A space sim that looks great, and isn't too taxing

#### OVERALL

★★★★★



**WIN!**

## Competitions

### Win ultimate gaming packs from Abit or Acer multimedia PCs

Take part in our competitions this month for these great prizes – see page 286



## Black Hawk Down

Join Delta Force for a mission in Somalia



**A** little ancient history. In 1993 a force of 123 American Special Forces troops was sent into Mogadishu, Somalia, to battle warlords who were hijacking United Nations supplies intended for victims of the civil war.

On their seventh mission, Task Force Ranger met with disaster – two of their Black Hawk helicopters were shot down and in the ensuing battle 18 American troops were killed, along with over 500 Somali militia. Ridley Scott made the 2001 movie *Black Hawk Down* based on these events, and this is the fifth game in the Delta Force series, with the same title.

Your character in the game is a member of Delta Force, and you have a series of missions to fulfil – but mainly you shoot guns. You also get to throw grenades and to use explosives, as well as driving around in a Humvee, or flying about in helicopters, including the Black Hawk. The manual is a cross between a Tom Clancy novel and a Lost Planet guide (lots of weapons specifications and notes on Somalia) and it gets you in exactly the right mood for the game.

As first-person shooters go, *Black Hawk Down* is good, but it's fairly similar to, say,

Counterstrike or Medal of Honour. You have a gun, you see an enemy and you shoot him. But – and it's a big but – there's another consideration with *Black Hawk Down*. As these are American troops in a desert environment with modern weapons, when you're playing the game there's an eerie similarity to the news coverage of the recent war in Iraq, which makes it rather uncomfortable.

The 20 missions give you a variety of scenarios as you defend a convoy, capture enemies, or fight an all-out pitched battle. We have little doubt that in a year or two *Black Hawk Down* will seem like just another first-person shooter (FPS), but right now it feels a little disturbing to play it with the appropriate level of gung-ho mindless aggression.

Leo Waldock

### DETAILS

**PRICE** £34.99 inc VAT  
**CONTACT** Novalogic  
 020 7324 8900 [www.novalogic.com](http://www.novalogic.com)  
**SYSTEM REQUIREMENTS**  
 733MHz Pentium III, 256MB of Ram, 750MB of hard disk space, Windows 98/ME/2000/XP  
**VERDICT**  
 Uncomfortable to play in the light of recent events  
**OVERALL** ★★★★★

## Rainbow Six 3: Raven Shield

A top team sport for Tom Clancy fans



**T**he first instalment of the Tom Clancy *Rainbow Six* series, *Rogue Spear*, struck a chord in the US, fulfilling the gun-toting Swat fantasies of many. The third episode, *Raven Shield*, brings very little new to the game, besides the superior Unreal engine that really helps you immerse yourself in the action. This means fans get more of the same, which is probably exactly what they're after. For those not familiar, it's a team-based FPS that set the standard most have failed to beat, *Operation Flashpoint* being a notable exception. You play through the eyes of various members of a team of crack commandos, but this element can be one of the most annoying parts of the game. If the team member you are playing dies, you jump straight into the next available person, leading to disorientation.

The 15 missions are loosely based around preventing an evil madman from discovering hidden Nazi treasure, but each is very distinct and usually involves rescuing hostages or preventing terrorist activities.

It's extremely tactics based and realistic, but you can spend more time in the war room choosing your team and refining your tactics than on

the missions themselves. It's therefore not going to appeal to those who just want to shoot stuff. Two shots and a player is dead, and you won't get him back to use in the following missions, so it's vital that you choose wisely in the war room which players to keep back for more intensive missions, and which of the less experienced to use essentially as cannon fodder.

The game plays very well using the standard keyboard and mouse layout, and there's some nice touches, like being able to slowly open a door rather than just blasting it open. The default difficulty setting is just right, though we'd have liked better AI for the bad guys – they're far too easy to bump off for our liking.

Mark Walsh

### DETAILS

**PRICE** £29.99 inc VAT  
**CONTACT** Ubisoft  
[www.ravenshield.com](http://www.ravenshield.com)  
**SYSTEM REQUIREMENTS**  
 800MHz Athlon or Pentium III, 128MB of Ram (256MB for XP), 32MB DirectX 8.1 graphics, 2GB of hard disk space, Windows 98/ME/2000/XP  
**VERDICT**  
 Raven Shield has superior graphics to *Rogue Spear*, which will be enough for the fans  
**OVERALL** ★★★★★





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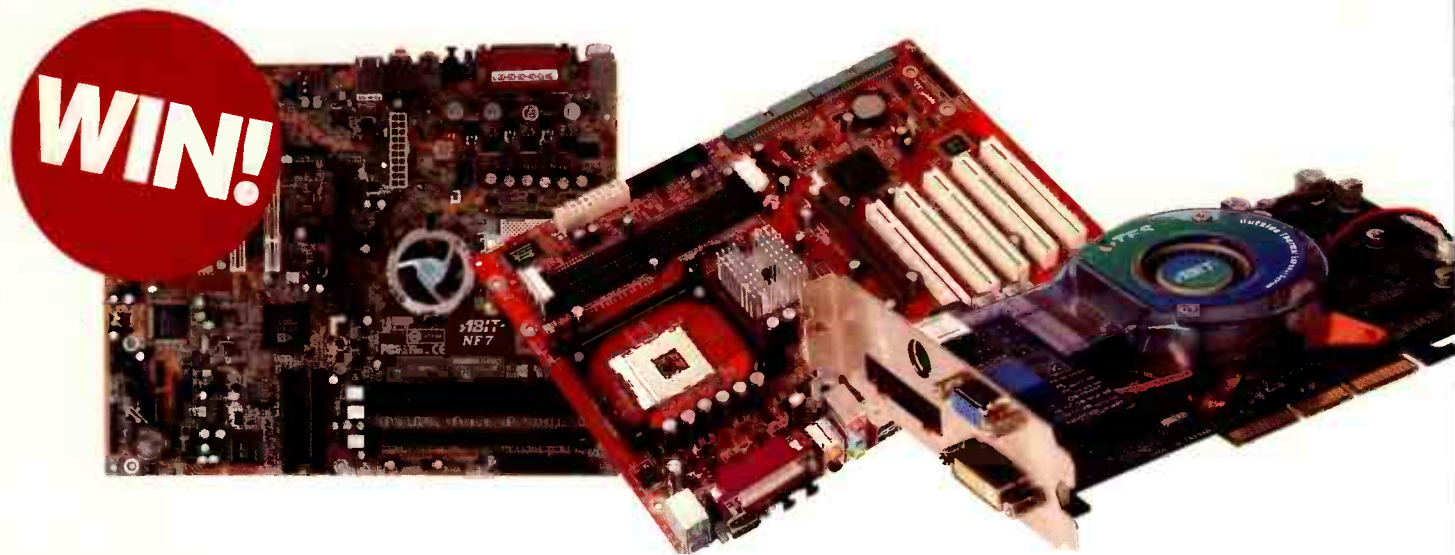
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## Five ultimate gaming packages from Abit



If you've been putting up with sluggish graphics processing performance for too long, then you'll be interested in the gaming package Abit is offering to five lucky PCW readers this issue.

The winners of this competition will each receive two of Abit's most popular new products – a Pentium-compatible BH7 or Athlon-compatible NF7-S motherboard and an Nvidia Geforce 4 Ti4200 GPU with AGP8X graphics card.

The BH7 is the long-awaited successor to Abit's hugely successful BH6 motherboard. Engineered for dedicated gamers, the BH7

offers the best in speed, stability and power. Overclocking is the name of the game, with all components designed specially for this very purpose. Abit's unique four-phase power solution delivers unsurpassed power, while ensuring the board will be compatible with future 800MHz front side bus CPUs.

The Nvidia name is well known to games enthusiasts across the world. The Geforce 4 Ti4200 GPU offers unparalleled graphics processing power, while the Nvidia Nfinite FX II engine brings an unbelievable 3D experience to your PC, with superb quality and frame rates.

Together, the BH7, or NF7-S motherboard and the Nvidia Geforce 4 Ti4200 provide today's gamer with all they need to make the most of any game.

For a chance to win this prize, simply answer the question below, and then follow the how to enter instructions.

**The Abit BH7 motherboard is the successor to which model?**

- a) The BH4
- b) The BH5
- c) The BH6

### PCW JULY 2003 ABIT COMPETITION ENTRY FORM

The Abit BH7 motherboard is the successor to which model?

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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, Abit and Acer. 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.

### May winners

The three winners of the Boltblue broadband Internet access are Horace Sutherland of Gravesend, Keith Lambert of Hampshire and Chris Barnes of Liskeard. John Douglas of London won the PC Nextday prize bundle.

## Two feature-packed multimedia PCs from Acer



**T**his month Acer is offering *PCW* readers the chance to win one of two Aspire G600 PCs worth nearly £700 each. With more features than your average desktop PC, the Acer Aspire G600 offers cutting edge technology coupled with the hottest digital audio/visual functions around. The Aspire G600 gives you up-to-the-minute TV and media facilities at the touch of a button.

It can import, process and copy data, images and audio from a wide variety of digital and conventional equipment – including video cameras and recorders,

TVs, CDs, DVDs and memory cards. This versatility makes it a perfect multimedia entertainment source, while still providing access to a full range of conventional desktop software.

With an Intel Pentium 4 processor at its core, the Acer Aspire G600 also features 256MB of DDR-Ram, four USB ports and two Firewire ports, CD-RW and DVD-Rom drives, and a 3-in-1 media card reader. It also comes bundled with a copy of Windows XP Home and an 17in Acer AC711CRT monitor.

Stylish and easy to use, the Acer Aspire G600 is ideal for families and will impress

even the most demanding user. It's a PC that will suit those looking for a machine offering true multimedia capabilities.

For a chance to win an Acer Aspire G600 simply answer the following question and follow the how to enter instructions next to the entry form below.

**How many USB ports are featured on the Acer Aspire G600?**

- a) Two
- b) Four
- c) Six

### How to enter

Fill in the coupon and send to the following address by 25 June 2003:

Abit or Acer competition, *PCW*, VNU Business Publications, 32-34 Broadwick Street, London W1A 2HG  
Or **email** your answer, name, address, daytime and mobile telephone number to us at **pcw\_competition@vnu.co.uk**  
Or **text** your answer to **85100**, ensuring you put the keyword **PCW1** for the Abit competition, and **PCW2** for the Acer competition at the beginning of your text, followed by a space, then your answer, then a space, then your name (eg PCW1 B John Smith). **Please send separate messages for each competition.**

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# Mindbenders

These puzzles will keep you amused for hours, and if you solve them you could win a Concise Oxford English Dictionary or a copy of Microsoft Encarta Premium Suite 2003

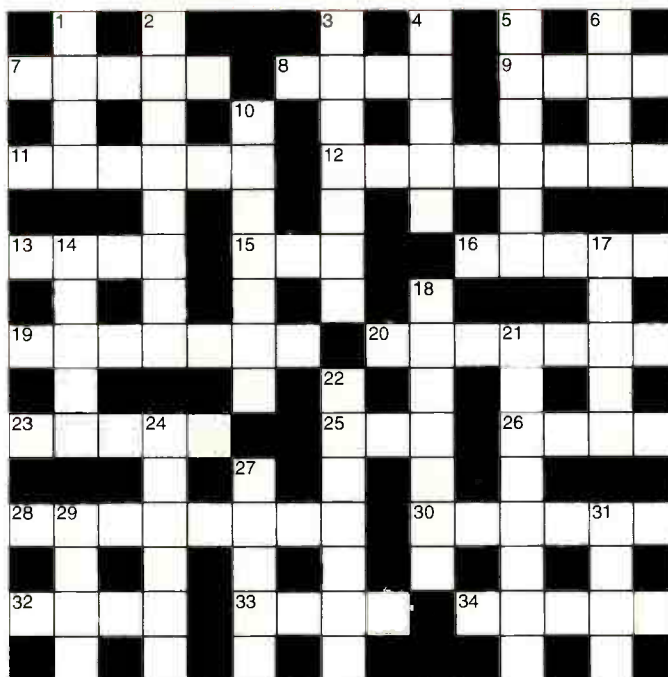
## Prize crossword

### ACROSS

- 7 Famous noise reduction system (5)  
8 Zero-length string (4)  
9 Data storage method (inits) (4)  
11 High-capacity storage systems (2,4)  
12 Printer control character (8)  
13 Condition where screen images move slowly (4)  
15 Server system for geographically close users (acr) (3)  
16 Operating (5)  
19 The H of HP (7)  
20 \_\_\_ code, major geographic domain name (7)  
23 \_\_\_ and white, monochrome monitor (5)  
25 Base 16 (abbrev) (3)  
26 Standalone application (4)  
28 3D image (8)  
30 Keyboard toggle between applications (3-3)  
32 Dial-up standard (acr) (4)  
33 Display of data (4)  
34 Enlarges part of an image (5)

### DOWN

- 1 Exchanged for cash (4)  
2 Odd, strange (8)  
3 Section of road for PSVs (3,4)



- 4 Straight-talking cold war spy? (5)  
5 Small Scottish farms (6)  
6 'Third Man' fruity Harry? (4)  
10 Place in solitary confinement (7)  
14 Round bicycle part (5)  
17 Irritates (5)  
18 \_\_\_ cable, aerial wire (7)  
21 Method of writing music, eg (8)  
22 \_\_\_ of Horrors, waxworks feature (7)  
24 Circus jesters (6)  
27 Take Miss Daisy for a spin? (5)  
29 Remove from office (4)  
31 Military force (4)



Each month, one PCW crossword entrant will win a copy of the Concise Oxford English Dictionary, and the brainteaser winner gets a copy of Microsoft Encarta Premium Suite 2003.

Send your completed crossword to: 'PCW July - Prize Crossword', VNU, 32-34 Broadwick Street, London, W1A 2HG, to arrive no later than **17 June 2003**.

Send the answers to the brainteaser to: 'PCW July - Prize Puzzle', at the address above, to arrive no later than **25 June 2003**.

Please state clearly on your entry if you DO NOT wish to receive information about other products and services from VNU Business Publications Ltd. Please state if you DO NOT wish your details to be passed on to other carefully selected companies for marketing purposes. No purchase of the magazine is necessary to enter the competition.

### May's winners

The winner of May's crossword is Leslie Oxley from Brighton and David Cunliffe from Rochdale won the brainteaser puzzle.

### SOLUTIONS

#### June crossword

ACROSS: 7 Patch 8 Grok 9 Even 11 Rename 12 Flip-flop 13 HPSB 15 EOL 16 Excel 19 Green PC 20 Burster 23 Hello 25 Run 26 Arty 28 Scan code 30 Usenet 32 CSTA 33 Tree 34 Basic  
DOWN: 1 Maze 2 Scramble 3 Profile 4 Skein 5 Ceefax 6 Hero 10 Receipt 14 Puree 17 Eject 18 Quantum 21 Spaceman 22 Freezer 24 Linear 27 Youth 29 Cosh 31 Exit

#### May brainteaser

Position	Name	Score
1	Jameson	3
2	Pyke	6
3	Scott	9
4	Willoughby	8
5	Arnold	4
6	Knight	1
7	Turner	10
8	Gray	7
9	Brown	5
10	Oliphant	2

Due to a production error, we are repeating the May brainteaser answers

## Who are the anoraks?

Ten children, five boys and five girls, are walking along in a double file. Half of them are wearing an anorak, half a cagoule; each anorak and each cagoule is either red, blue, yellow, green or mauve - one of each colour. No two similar colours or garments are together in a row.

Odd numbers are on the left and even on the right. Rachel in mauve has a number three higher than the blue cagoule and two lower than the red anorak; Sue in green is alongside a boy in a cagoule; Mary's number is three lower than Anna's; Tommy in an anorak has a number three higher

than Josie's; Freddie in a cagoule is immediately behind a child in green and immediately ahead of a girl in a cagoule; Darren in red is immediately behind Jimmy and alongside the mauve anorak; Darren's number is three higher than the red anorak. Billy has a number one lower than a yellow garment.

Child number 6 has an anorak and child number 7 is a girl. In which position is each child and what garment is each wearing?

Solve the puzzle and send your answers to the address above right.

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## JULY 1983

Probably the most important release of July 1983 was Epson's classic FX-80 dot matrix printer, which inspired a whole generation of follow-on products from Epson and its competitors. The machine was remarkable for its versatility and ease-of-use. As our reviewer said, 'the FX can be configured for various conditions by changing the settings of internal switches. You don't have to take the machine apart to get at them... and [they] can thus be changed even with the paper still in the printer, a great improvement.'

All this talk of dip switches has got us all misty-eyed – they were the drivers of their day. Elsewhere, not one but two



The ground-breaking Epson FX-80 offered the user greater versatility two decades ago

writers were set the task of pulling the groundbreaking Apple Lisa to pieces and putting it back together again at the end of a lavish 12-page review.

'Reviewing the Lisa in terms of what its hardware looks like and can do is rather misleading,' wrote our reviewers. 'To force a distinction between the hardware and the software really overlooks the purpose of an integrated environment.' We're pretty sure they meant you could move things around with a mouse and point at things.

## JULY 1988

The word 'transputer' means little or nothing to the majority of us these days. Back in 1988 though, it was a real buzzword, even though the first parallel processing PCs had appeared in 1984. They were particular news in this issue due to the unveiling of Perihelion's Helios, the first operating system to cater specifically for them.

The most common use of transputers was to assemble an array of these number-crunchers together and control them via a single more conventional computer running Unix or PC-Dos. The transputers would run data processing software directly on the hardware, as running an operating system would sharply reduce the amount of data the chip could run. But with the

growing trend for using transputers as standalone PCs, Helios seemed like the ideal OS, as

its kernel is spread across the processors. This reduced the processing time and made the transputer a fast, if incredibly expensive, home workstation.

The need for transputers diminished as Intel released its range of fast processors, capable of running feature-packed operating systems and applications. Its 25MHz 386 chip was unveiled in this issue, coupled with Sun's equally speedy attempt, and heralded the start of the clock speed wars that continue to this day.

## JULY 1993

Our cover story in July 1993 was the brand new Pentium chip, also called the 586. The problem was that Pentium processors were in short supply from Intel and, despite the fact that the new chip had been unveiled back in 1992, it wasn't until late 1993 that it was seen in PCs. We now sometimes carp and moan about graphics chips that take a few months to appear on sale, but a year? Incidentally, in our round-up we recommended that you stick with a 486.

Lotus got back in gear by releasing the latest version of its 1-2-3 spreadsheet for Windows – after its ill-fated decision to first develop the new software for OS/2, giving Microsoft a window of opportunity to promote Excel.

PC sound cards were an expensive luxury in 1993, and the Logitech Audiomann was intended to redress the balance. This external device connected to a parallel port and combined a sound card, speaker and microphone in a single unit that cost £99 and looked similar to a Richard Rogers design for a skyscraper. Logitech is partly to blame, therefore, for encouraging office workers worldwide to irritate colleagues by assigning 'humorous' sound effects to Windows events.

Meanwhile, we put 22 large CRT monitors through their paces in a group test, with sizes ranging from 17in to 28in. Names such as Aydin and Qume have vanished from retail sale, but most of the manufacturers are still going strong. Prices ranged from £699 for a 17in Philips to £3,198 for that Aydin, which may explain a thing or two.

## JULY 1998

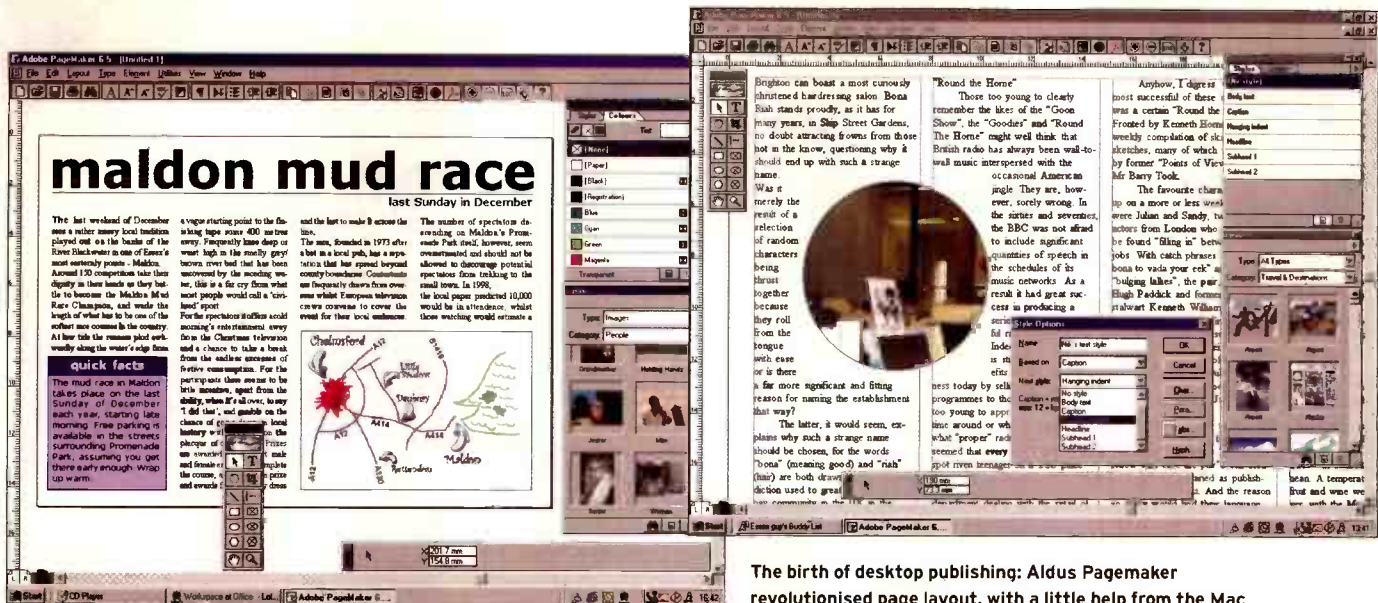
It is easy to forget that not so very long ago, before Microsoft and Intel persuaded us all of the virtues of a high-powered standalone desktop PC, the computer terminal was king. Back then, most large businesses and academic institutions didn't rely on an army of PCs with the storage, processing and memory requirements to run modern operating systems, but on a network of dumb terminals powered by powerful centralised servers.

The high cost of ownership and the lower administrative control associated with keeping a fleet of PCs up and running has caused many large organisations to reconsider the viability of the standalone PC-based business computing solution, and reassess the merits of what today would be termed thin client solutions. This was the subject of our network computing feature back in the July 1998 issue, which put eight thin client machines through their paces, as well as reviewing some of the main operating systems of the day. The Tektronix NC217 scooped our Editor's Choice award due to its combination of powerful hardware and a range of flexible expansion options.

This issue also featured the PCW Awards 1998, with no less than 30 categories for different products. You voted PC World the best UK high street retailer, and gave Dell an award for best telephone support. Meanwhile, the Mesh Elite Professional PII scooped the best home PC award, and HP won the best inkjet printer category with its Deskjet 270C.

The PCW team





The birth of desktop publishing: Aldus Pagemaker revolutionised page layout, with a little help from the Mac

# Aldus Pagemaker

The arrival of Pagemaker heralded the start of the desktop publishing revolution

**A**s 1984 drew to a close, Apple was riding high on respect for its Macintosh, but the 'computer for everyone else' needed a killer application. The trouble was IBM had the business market sewn-up, homes were yet to adopt proper computers, and the Mac was too expensive for schools. Then two new companies arrived with ground-breaking and complementary products, which would give the Mac an edge that remains to this day: on 15 July 1985, Pagemaker was unleashed and the desktop publishing revolution began.

Pagemaker was the brainchild of Seattle-born Paul Brainerd. As a former newspaper editor and employee of Atex, he experienced first hand the expensive proprietary systems used in professional publishing. Brainerd believed the process could be achieved with affordable personal computers and, when Atex was later bought by Kodak, he left with his unique idea and the payoff to fund it.

The concept of professional quality type setting on a personal computer lead Brainerd to coin the phrase 'desktop

publishing' and, with the help of four engineers from Atex, he set about realising his dream. Brainerd founded his new company in 1984 and named it Aldus, after the Renaissance printer and publisher Aldus Pius Manutius.

By spring 1985, the prototype of Pagemaker was ready, and the timing couldn't have been better. Brainerd was looking for investment and a computer suitable for running his new program, while Apple needed a killer application for its Mac, which, coincidentally, had sold well with designers and artists.

After seeing a Mac and learning of Apple's relatively affordable laser printer, Brainerd knew he'd found the right platform. And, once John Sculley (Apple's then top man) had read Brainerd's white paper on desktop publishing, he realised the potential.

But what of the other key product which played an equally crucial role in the birth of desktop publishing? Like so many computing technologies, this too began life at the legendary Xerox Palo Alto Research Centre (Parc), birthplace of Ethernet and the graphical operating system. While at Parc, programmer John

Warnock developed a language called Interpress, which could drive the Xerox laser into producing scalable graphics and type. Legend has it Warnock tried to persuade Parc for two years to develop Interpress into a commercial product, before he and boss Chuck Geschke left and did it themselves. They named their new company Adobe, after a creek in Warnock's backyard, and set about refining what was now called the Postscript page description language.

Adobe originally planned to produce its own laser printer, but with \$2.5m investment from Apple, Warnock was persuaded to develop a Postscript controller for the new Apple Laserwriter. Equipped with Adobe Postscript, the Laserwriter could output typesetter-quality pages.

Pagemaker, the Postscript Laserwriter and the Apple Mac were literally a perfect match. Indeed, clearly recognising its saviour, Apple paid for much of the initial marketing of Pagemaker. All of a sudden, the Mac's graphical interface had professional justification, and the IBM PC's command prompt seemed very primitive. Desktop publishing was an

instant hit, not only taking over professional publishing environments, but developing a new market of small companies and individuals who created their own newsletters. The Mac had its niche and the threesome of Apple, Adobe and Aldus seemed unbreakable.

Until 1988 that is, when newcomer Quarkxpress launched its vision of desktop publishing for the Mac. Quarkxpress boasted finer typographic control and stayed ahead of Pagemaker on subsequent editions. By version 3.1, it had won over almost all Pagemaker supporters.

Today, Quarkxpress may dominate the professional desktop publishing market, but Pagemaker is still developed by Adobe, which merged with Aldus in 1994. Brainerd's original concept of desktop publishing may be 18 years old, but it's had a profound impact on document creation, as we take flowing text and multiple columns for granted.

Pagemaker may not have succeeded without the Macintosh or Postscript Laserwriter, but it remains one of the most unique and influential applications created.

Gordon Laing





# 3 FULL PROGRAMS

Software worth £378

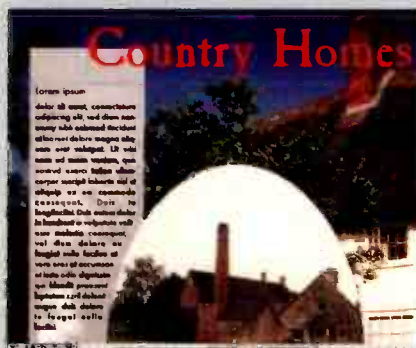
# July Cover Disc

## Power Publisher [www.gsp.cc](http://www.gsp.cc)

At the core of this suite is the very capable DTP package, Greenstreet Publisher 3. Whether you're putting together documents for printing, or preparing them for the web, Publisher is easy to use and flexible. As well as all the layout tools you are likely to need, there are features – not found in some of the big-name professional packages – such as Publisher's table tool, which includes auto sum fields and comprehensive style options. And you can create mail lists and use mail merge to insert name and address details. There's an 'Intelligent printing' feature – for example, if you have chosen to create a greetings card, Publisher will determine how it should be folded and print it accordingly. Even printing on both sides of the paper has been made easier. You can view as many pages as you want, and with the multiple undo function you can step back through all the changes you've made to your document.

Then there's Greenstreet Draw 3.5. You can experiment with a vast range of easy-to-implement graphic effects – including blends, skews, rotations and fill styles – then use them to liven up your DTP, word processor and other Windows documents. This award-winning drawing program is ideal for beginners, but also includes comprehensive design features that professionals will appreciate. Page Pilots (wizards) make getting started easy. Features include text-on-curve, blending between two shapes or text, a range of draw shapes and drawing tools, colour fill styles, palette control paint-box mix and line styles. There's bitmap auto-tracing to identify outline shapes and create editable vector paths. You can colour, rotate or skew bitmaps and create patterns.

Other modules include Powertext 3D which lets you create professional looking 3D text effects, complete with textures and adjustable lighting camera angle and perspective. Picture Browser views and exports images in 10 popular formats. Snapshot is a useful program for capturing images on screen and Photofx allows you to perform simple photo optimisation procedures.



## Full versions

### 4D 6.7

[www.4duk.com](http://www.4duk.com)

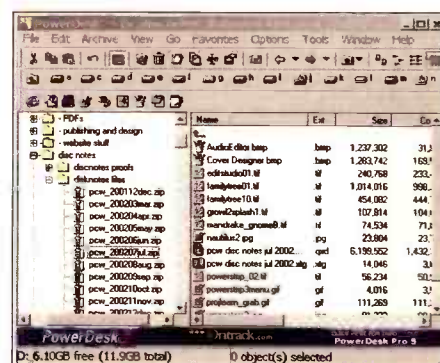
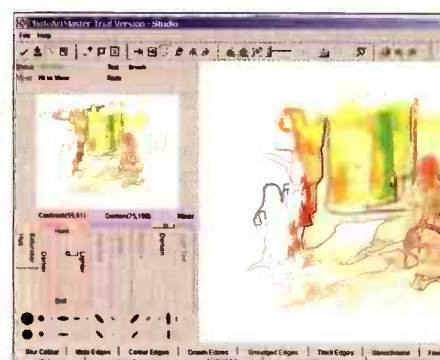
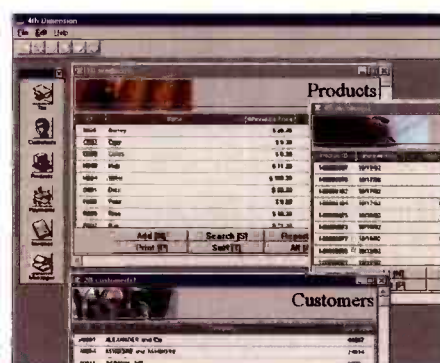
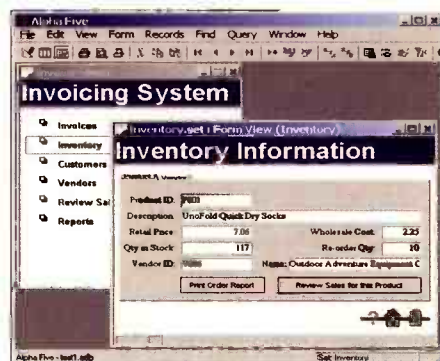
On the disc this month you'll find a fully-functional copy of 4D Standard Edition 6.7, as sold for £195. 4D can create very fast database applications – 100,000s of records can be searched and sorted in a split second, and the software handles up to 16 million records. A useful label editor, powerful report writer and graphical charting functions are included, and the 4D Runtime allows unlimited distribution of non-compiled standalone applications. Flexible forms mean you can design functional and user friendly interfaces, and there's a powerful, multi-threaded built-in web server for publishing databases on the web. Useful

Internet commands allow email, FTP and other web functionality to be added on to 4D web-enabled applications. SSL support allows security for ecommerce applications across the web, and there's full CGI support for Perl, cgi-bin, ISAPI dll and others. You can obtain your free licence number by visiting [www.4duk.net/pcw03.shtml](http://www.4duk.net/pcw03.shtml) and filling in a short online form.

### Alpha Five 4.5

[www.alphasoftware.com](http://www.alphasoftware.com)

Alpha Five is a general-purpose relational database management system (RDBMS). Its serves as a means of entering, processing, and outputting information. Alpha Five provides tools for processing and outputting data. Some of the more typical uses are



Top to bottom:  
Alpha Five 4.7  
4D 6.7  
Photoartmaster  
Powerdesk Express 5





inventory tracking, invoice handling, accounting, employee management information and property rental. Alpha Five now has a variety of pre-built tables and sets complete with forms, reports and other layouts. These allow you to start work immediately, using pre-designed components that you can customise.

The comprehensive documentation is supplied in electronic form and includes a Getting Started guide, What's New guides, an in-depth User Guide/reference, and Xbasic Reference Manual covering all Alpha Five Xbasic methods, functions and commands, together with examples. To use Alpha Five 4.5, you will need to register at [www.alphasoftware.com/promo/mags/uk4](http://www.alphasoftware.com/promo/mags/uk4). They are also giving away 250 copies of Alpha Five 5, worth £199 – these will be allocated to every fifth reader registering version 4.

## Free versions

### Powerdesk Express 5

[www.guildsoft.co.uk/vcom](http://www.guildsoft.co.uk/vcom)

Powerdesk Express 5 is a kind of luxury file manager, offering far more features and functionality than the limited file manager offered in Windows or other file management software. It completely replaces Windows Explorer, giving users a wide array of tools to search, edit, delete, move, sort, view and copy files, including those found on digital cameras or mp3 music players.

The free version offered on this disc has some of the features of the Pro edition, including dual-pane views; multiple drive searching based on mp3 tags or file content, zip handling, encryption and low-level deletion, email attachment encoding and decoding and more. Powerdesk Express is not time-limited. For a pdf of the manual go to [ftp.guildsoft.co.uk/pub/files/PDS\\_manual.zip](http://ftp.guildsoft.co.uk/pub/files/PDS_manual.zip)

### Pal E-Shredder

<http://palsol.com>

This useful program is designed to completely obliterate specified files or whole folders from your hard disk, making them unretrievable even using specialist tools. Existing data is overwritten with meaningless bits and bytes. Use with care though, as the process is not reversible.

### Web Easy Express

[www.guildsoft.co.uk/vcom](http://www.guildsoft.co.uk/vcom)

Web Easy is a complete web design studio that guides you through page design, importing graphics from your digital camera, scanner or CD-Rom, uploading your finished site to the web and making

changes and updates. This Express version is not time limited, but some advanced features are not available. It's limited to a web site of three pages, and only a small number of templates and clipart are included.

### PC Magazine E-books

[www.pcmag.co.uk](http://www.pcmag.co.uk)

Our sister title, *PC Magazine*, may no longer be available at the newsstand, but its still available online. And you can read it in a new e-book (pdf) format on this month's disc (Adobe eBook reader is also supplied). You'll find the full February, March and April issues.

## Trial versions

### Diskeeper Home Edition

[www.execsoft.co.uk](http://www.execsoft.co.uk)

Fragmentation happens when pieces of files on a disk are not contiguous, but are broken up and scattered around the disk. Diskeeper keeps your PC running, and prevents system problems, slowdowns and crashes by eliminating hard disk fragmentation.

### Photoartmaster

[www.fo2pix.com](http://www.fo2pix.com)

This unusual and interesting program is designed to help you paint pictures from your own photographs. Photoartmaster analyses your photo then customises 'source palettes' from which you'll create your picture. Adapt, brush and fill the resulting lines and colours onto the canvas and impressive effects can be achieved with minimum effort.

### WinMHT

[www.spidersoft.com](http://www.spidersoft.com)

This is a great tool for web researchers as it allows you to save collections of complete web pages as mht archives for fast offline viewing, while web archive files are portable. No special software or reader is required.

### Sendphotos

[www.novatix.com](http://www.novatix.com)

Sendphotos is a fast and easy way to share digital pictures through your email. You can select the stationery design from more than 50 available templates and add customised text and photo captions if you wish.

### Picmaster

[www.graphics-tools.com](http://www.graphics-tools.com)

Picmaster is designed for image editing and more. It includes the usual editing tools, plus Photoshop-compatible filters, webcam handling, slideshows, 3D objects and stereo photos, video image capture, scanning, catalogues and more. You can record a sound comment to each picture and it even supports the new jpeg2000 format.

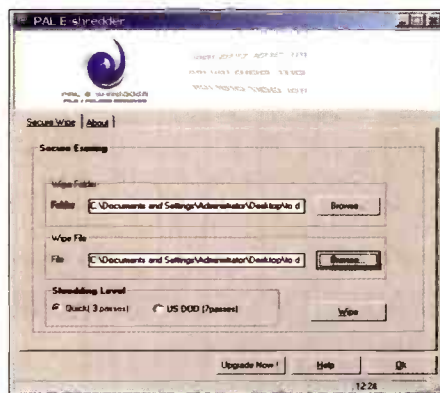
## Top to bottom:

Sendphotos

Web Easy (Pro edition shown)

Pal E-Shredder

Picmaster





## What's on the DVD

If you bought the DVD edition of PCW, you'll have all of what the CD-Rom has to offer, plus the programs below

### Full versions

#### Money Matters

[www.qsp.cc](http://www.qsp.cc)

Money Matters is a personal finance package that offers all the features you need to manage your money successfully without having to resort to a calculator or scraps of paper. It will help you to enter account transactions quickly and accurately, handle regular payments with standing orders, track transfers between your accounts and check your bank, credit and charge card statements automatically. It even generates graphs and reports to help you understand your financial situation at a glance. You can budget your expenditure over time and compare your current financial situation with your budget, or check your estimated financial situation at a given specified date.

Money Matters can manage up to 40 accounts in a single data file. Each account is graphically represented by a button on the account bar, depending on the type of account – Visa, current, cash, savings etc.

Also included is a comprehensive electronic manual which takes you from the basic steps through to the programs more advanced features. There's an example accounts file that you can experiment with until you become familiar with the program.

### Photo-editing collection

To tie in with this month's PCW group test (see page 125), we've got a collection of useful photo-editing programs:

**Able Photo Slideshow** – just point the program at a folder of pictures, then sit back and watch. **Arcsoft Panorama Maker** seamlessly combines horizontal, vertical or tiled sets of images to create panoramas. **Autocolor** reclaims much of the detail and colour lost during format conversion. **Instant Thumbview** displays image thumbnails in a tooltip window when you hover the mouse pointer in Explorer. **Irfanview** is a fast freeware image viewer/converter and more. **Polyview** is an image viewer, conversion and printing utility. **Repligator** is a set of 80 easy-to-use graphics effects, and a trial version of **Adobe Photoshop 7** needs no introduction.

### Playable games demos

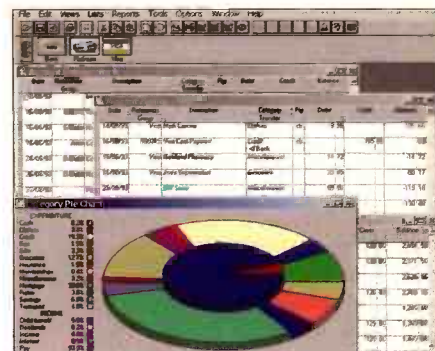
There are six playable demos this month, including **Indiana Jones and the Emperor's Tomb** – use your trademark whip and pistol to avoid deadly traps and navigate through various dangerous environments circa 1935. **Devastation** – it's the future, and corrupt corporations control what's left of society. The graphics and physics of this game are worth a look, as practically everything can be used, destroyed or manipulated. **Postal 2** – suitable for those 18 years or over, is a first-person shooter where you can explore 3D environments and shoot just about anything you want. **Bandits: Phoenix Rising** – cruise your cannon-mounted combat car across green fields, desert canyons and deep snow, bombing and blasting all manner of enemies. **Delta Force: Black Hawk Down** – broadly based on US Special Operations Forces activities in Somalia, you get to save the free world – US style. **Tom Clancy's Rainbow Six 3: Raven Shield** – command an elite multinational squad of special operatives against a hidden terrorist foe. This is the single-player demo.

### 70 essential utilities and add-ins

In our regular section you'll find more than 70 of the top must-have programs and add-ins, sorted into five main categories – Internet, office, creative, utilities and others. Recent examples include Sun Openoffice.org (Windows and Linux); PC Maclan; Zonealarm; Opera browser 7; Musicmatch Jukebox 7.5; Windows Media Player 9; Diskkeeper Lite 7 freeware and Digiguide 6.

### PCW workshops and product tests

You'll find a huge selection of past group tests and workshops in the Editorial section on the DVD-Rom. Two years of product tests from the pages of *Personal Computer World* include desktop PCs, anti-virus software, CD writers, databases, digital cameras, DTP software, hard drives, image editors, monitors, motherboards, notebooks, PDAs, printers, visual programming software, web cams, DVD-Rom drives, scanners and much more.



Top to bottom:  
Money Matters  
Autocolor  
Devastation  
Bandits: Phoenix Rising

# Next Month

**on sale 26 June 2003**

We rate the real technical advances of the past 20 years, and separate the innovators from the imitators



## 20 new tricks to teach your PC

We all know computers can crunch numbers, access the Internet and also entertain you, but is that all they're good for? The answer is a definitive no, as we show you 20 useful and fun things you never knew your PC could do

## Innovation or imitation?

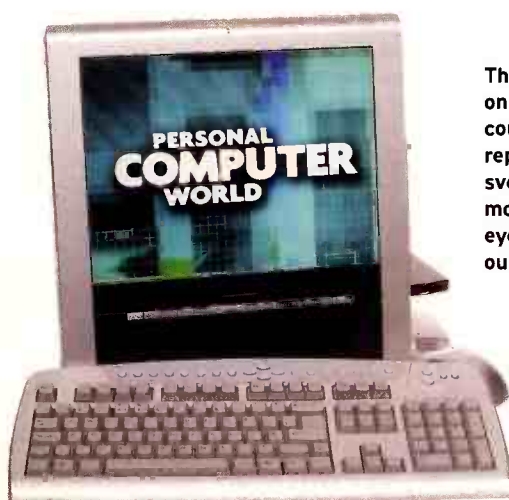
Has the age of invention come to an end? *PCW* looks back over the technology of the last 20 years, and asks, is any of it really new, or just a faster, smaller version of what we had before?

## Space-saving PCs

Why put up with big bloated beige cases when you can have the ultimate in compact computing? We cast an appreciative eye over the latest slimline systems on offer

## Motherboards

Looking to upgrade your PC to the latest and greatest spec? If so, you'll need a decent motherboard. We test more than 20 of the latest Pentium 4 and Athlon motherboards to help you make the right choice



That beige beast on your desktop could soon be replaced by a svelte slimline model. Feast your eyes on some of our favourites

**There's lots more in  
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The latest Athlon and Pentium 4 motherboards on test in our labs

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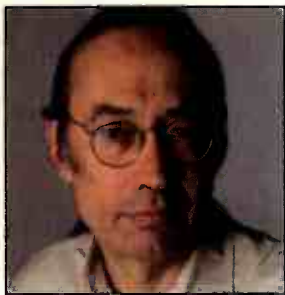
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# We need to grapple with management

Data management is the biggest issue facing PC users, says Ed Henning, and developers should acknowledge it

**A** few people who have called me recently to discuss PC problems reminded me of just what I look for in the ideal operating system. Despite its dominance in this area, Microsoft has been relatively weak at creating the ideal – a useable, manageable, understandable and easily navigable filing system. For those of us that have been using PCs for many years, the filing system presents few problems, but for many newer users it is a great barrier.

In fact, even for the more experienced users, the sheer size of modern hard drives and the quantity of data they often hold are causing problems of data management, but in my view, my data is the single most important feature of my PC – it is the very reason the PC exists.

If we step back a few years, you may remember when Microsoft, making a point about Windows 95, hoped the new system would encourage users to use more applications – both at the same time in a multitasking environment, but also in the general sense of using a greater variety of applications.

This has certainly happened, but in my opinion a more important factor has been the increase in processor speeds, enabling us to use more complex types of data. I could go on about how the evolution of the PC is best described by the data types we have been using, but that's for another time.

A consequence of us using a greater number of applications is that we now have a much greater variety of data files on our hard drives, stored in many different places, many of them taking up significant space due to their complexity. The features in the operating system to help users manage and keep track of all this data have nowhere near kept up with this change.

Microsoft has made a reasonably good fist of organising and managing applications, perhaps because this has been an easier problem to tackle. However, it has also made something of a mess – with the haphazard placement, and often replacement, of dynamic link libraries (DLLs). The system is a disgrace, and is simply baffling to most users, who would rather never even hear of a DLL, let alone know whether to delete one.

What is a non-technical user, when removing or changing some application, expected to do when told that a file is about to be removed but that other applications may not work properly afterwards? Of course, the file gets left there, and yet more garbage is left on the hard disk eating up space, creating more of a mess.

There is a similar, but much larger problem with data. It is the nature of things that the greater profusion of

items there are, the more difficult they become to manage. The more an increasing quantity of data is spread in different places on a disk in different formats, the more easily we make mistakes or wrong decisions.

And as far as hard disk space is concerned, the cheaper anything becomes, the less careful and discriminating we are with it. The huge quantity of data actually can become an obstacle to achieving what we really want, and when a problem strikes, the results can be impossible to reverse. And, of course, any error is bound to occur at the most inconvenient of times – and inevitably when you have just let a few days go by without your regular main backup.

Now, I don't want to get rid of the data, or reduce its variety, but it does need better management. The larger the hard drive, the worse the housekeeping problems become, but few of us get in a regular housekeeping habit.

My contention is that we need much more help from operating system writers and application developers – Linux is no better in this respect, but its problems are different.

Some of the latter do not seem to have progressed much

beyond the days in the 80s when some applications would only install onto one drive – C. Many now do let a user choose the target directory for data. One piece of software I like in this respect is a free suite, Software602 ([www.software602.com](http://www.software602.com)). Among its many good features is the fact that it will always go back to the last directory in which you saved something. A simple touch, which makes a huge difference to absent-minded humans.

Many application writers do not seem

to take into consideration the fact that users use other vendors' applications as well. Where any commonality is concerned, the operating system should set the lead, and to a limited extent Windows does, but Microsoft's ideas such as 'My Documents' seem half-hearted. For a start, if you were an application developer, would you use something like that for your data location? Could you feel confident that it will still be there in the next version of the operating system? Microsoft likes few things better than seeing a set of goal posts and then moving them.

In one of the phone calls I received recently I was asked about how to send an image as an attachment. 'How do I get it out of the image software and into the email?' It seems so simple when you know how, and the right grammar helps, but there are countless users out there with similar problems and misunderstandings.

It is about time Microsoft and others tackled these problems properly. Over the years they have learned about the concept of usability, but manageability should be just as big a focus.

**'Microsoft likes few things better than seeing a set of goal posts and then moving them'**



# KOMPLETT.co.uk

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- ▶ Audio Amplifier integrated
- ▶ With remote control
- ▶ Retail-version

**£75**

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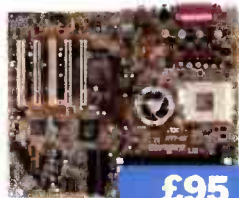


**£75**

SKU/Itemnumber: 156874

#### Abit BH7 mainboard for S478/533

- ▶ S-ATA, ATX
- ▶ I845PE, FSB800, LAN
- ▶ DDR400, USB 2.0



**£95**

SKU/Itemnumber: 157213

#### Abit NF7-S V2.0 mainboard for Socket A

- ▶ S-ATA, ATX
- ▶ nForce2-SPP/MCP-T, 1394
- ▶ SATA KIT



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SKU/Itemnumber: 157169

#### Gainward GeForce FX 5200

- ▶ 128 MB DDR 5ns
- ▶ AGP, "PRO/660TV-DVI"
- ▶ Tv-Out, Retail



**£49**

SKU/Itemnumber: 138626

#### SONY

#### Sony IDE 52x24x52x CD recorder

- ▶ Internal Retail Kit (CRX220A1)
- ▶ Power-Burn for Buffer Underrun Protec.
- ▶ Cache /Buffer Size: 2 MB Input



**£110**

SKU/Itemnumber: 109683

#### Western Digital Caviar 120 GB IDE

- ▶ Special Edition, 8MB cache WD1200JB
- ▶ Spindle Speed: 7200 RPM
- ▶ Interface type: DMA/ATA-100 (Ultra)

1 GB is defined as 1,000,000,000 bytes with regard to hard drive capacity.



**£325**

SKU/Itemnumber: 158993

#### Hansol

#### Hansol H750 17" LCD

- ▶ Silver version
- ▶ Integrated speakers
- ▶ TCO-99 (standard)



**£119**

SKU/Itemnumber: 358017

#### JazPiper

#### JazPiper MP3 DVE128U+ player

- ▶ 128 MB, USB
- ▶ MP3 playback, Line-in, Id3tag
- ▶ Dig.rec.time: 480min - voice recording



**£479**

SKU/Itemnumber: 113625

#### Nikon

#### Nikon Coolpix 4500 digital camera

- ▶ 4.0 Megapixel, 4x zoom
- ▶ Precise 7,900 step Multi-Area Autofocus
- ▶ Automatic Built-In Pop-up Flash

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