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**Office 2000
First Full
Review**

**Pentium III
state of the art!**

**Value or
power?
...your
choice**

Pentium II vs III

Ten £1500 PCs compared

3D graphics cards
12 of the best on test

Storage round-up
100Mb to 22Gb

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Amazing £299 PC
Intel Pentium III Xeon
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Corel Draw 9

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3 FULL PROGRAMS



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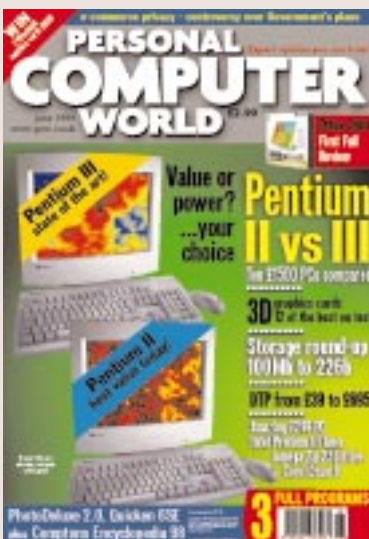
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State-of-the-art PIII or tried-and-tested PII? It's your choice.

Pentium poser

PIII or not PIII, that is the question. It's a tough decision for PC buyers when Intel launches its latest processor. Do you pay through the nose just to have this month's state-of-the-art chip, or do you stick with the old one, described only weeks earlier as 'being the best there was' and which now, with discounting, appears to represent pretty good value for money? In this month's PC group test we asked five manufacturers to submit two systems each: one built around the old Pentium II, the other housing a brand new Pentium III. To make it more interesting, both systems were built for exactly the same price. Will processor discounting allow the PII systems to boast greater-quality extras, or will the sheer muscle of the PIII bully its way to the top? Turn to page 128 to find out.

Meanwhile, Intel's advertising seems to have confused the public about what the Pentium III does best. I was certainly slightly baffled when the TV ads claimed that the Pentium III brought the internet to life. Personally, I've always

I was baffled when Intel's TV ads claimed that the PIII brought the internet to life. **A FASTER CHIP MAKES LITTLE DIFFERENCE** to exploring the web

found that accessing quiet sites with faster connections brings the internet to life. A faster processor will greatly benefit games players or anyone number-crunching, using, say, Photoshop filters

or maths packages, but a faster chip makes little difference to exploring the web. Intel's argument must boil down to decompressing and processing heavily encoded multimedia web content, which the Pentium III presumably eats for breakfast. Well, it should do, once the programming world starts to include code that makes use of the PIII's Katmai New Instruction set (KNI). Like MMX before it, KNI-enabled software will run faster on a chip with KNI support – so far, that's the PIII or the new Xeon (*also reviewed this month*). However, like MMX when it first came out, there's not a great deal of KNI-optimised code currently out there. Until the software world starts writing for KNI, the only benefit a PIII has is a potentially higher clock speed – currently only 10 percent faster than the speediest PII.

If you're slightly bemused by the ever-increasing speed of main CPUs, you can't help but marvel at the meteoric rise of 3D graphics performance. Hardly a month goes by that there's not a new contender to the 3D throne. Now the dust has settled on the arrival of 3Dfx's Voodoo3 and ATI's 128-bit processors, which will come out top? Our graphics card group test (page 176) shows you. With VideoLogic's PowerVR Second Generation (as seen on Sega's Dreamcast console) and Riva's TNT2 just round the corner, PC gamers have never had it so good.

Also in this issue is a report on the Government's controversial white paper on eCommerce and encryption which could seriously infringe on your privacy (page 124). It's a hot topic that we should all keep our eyes on very closely.

Finally, this is my last issue of *Personal Computer World* as Editor. I'd like to thank everyone for their support over what have been the best seven years of my life, and to wish my successor, Bobby Pickering, the best of luck at the helm of Britain's greatest PC magazine.

Gordon Laing, Editor

WELCOME TO THE **JUNE 1999** PERSONAL COMPUTER WORLD CD-ROM

June COVER DISC

GAMES

APPLICATIONS

LIBRARY

ENTERTAINMENT

INTERNET

Everything's going digital, but as dealers seem to give away digital cameras with every new PC, nobody should be without the required software for photo-editing – and none comes bigger than Adobe PhotoDeluxe. This month you'll find a FULL VERSION of version 2.0 of this excellent package *and* a great upgrade offer to 3.0. There are more FULL VERSIONS on the disc, too – there's Sidekick 95 organiser software and a return visit for Quicken 6 SE accounts software, for anyone who missed last month's issue. Plus there's Internet Explorer 5 – hot news, but normally 62Mb to download. Good exploring!

Adobe PhotoDeluxe 2.0 FULL VERSION

Serial Number

In order to use Adobe PhotoDeluxe 2.0 from the CD, you need to enter the following serial number when requested:

HTW200N7000002-383

PhotoDeluxe 2.0 for

Windows 95 is a consumer photo-editing program based on Adobe Photoshop. It allows users to enhance and personalise digital photos, with nothing more than point-and-click

computer skills. It comes with more than 30 special effects like crackle, body switch, patchwork and glowing edges, and utilises more than 50 template-based 'Guided Activities' for creating greeting cards, business cards, photo albums and T-shirt transfers. (Please note that Clipart and a Templates folder will be included on next month's PCW CD.) It's fun and easy to use, and advanced technology assists with much of the work: for example, you can remove unwanted 'artifacts', apply foolproof cutting and tracing, and fix 'red-eye' in one step. An Organiser lets you create personalised photo galleries to store, organise and retrieve images.



click the INSTALL button to run the installation program.

• A full tutorial on how to use Adobe PhotoDeluxe 2.0 is on page 186.

➔ *PhotoDeluxe 2.0 is made available subject to Adobe's standard terms and conditions. All intellectual property rights in PhotoDeluxe 2.0 belong to Adobe or, where appropriate, to Adobe's third-party suppliers.*

Upgrade Offer

Exclusive to this month's *Personal Computer World*, Adobe offers readers in the UK and Eire the opportunity to upgrade from PhotoDeluxe 2.0 to PhotoDeluxe Home Edition 3.0 at the following prices:

➔ **To install from the CD**, go to Featured Software from the main screen of the Personal Computer World interface. Select Adobe PhotoDeluxe. Preview the product, then

■ **UK upgrade** £25.00 + VAT, £29.38 (inc VAT)

■ **IRL upgrade** £29.00 + VAT, £35.09 (inc VAT)

■ **Order code** (13731)

■ **PhotoDeluxe 3.0 Home Edition features:**

- ➔ The easy import of photos from scanners, digital cameras, floppies, CD-ROMs and the internet.
- ➔ Correct faults like red-eye, scratches, brightness or darkness.
- ➔ Put together composite shots you could never take yourself.
- ➔ Put together a pictorial record of family landmarks.
- ➔ Add lifelike images to your personal stationery.
- ➔ Hundreds of templates for cards, calendars and photo frames.
- ➔ Add your own pictures to your web site.

To take advantage of this offer, simply call Adobe from the UK or Eire on +44 (0) 131 458 6842 and quote the reference number PDLX-00CUAZ9. You will also need to have your Adobe serial number ready (the number specified above, that you use to install the software).

PhotoDeluxe can also be purchased on the web at www.adobeshop.com.

Offer available until 31st August 1999.

PCW DETAILS

Platform Windows 95
Limitations FULL VERSION
Sales Contact N/A
Technical Support FAQs at www.adobe.com/supportservice/custsupport/TECHGUIDE/PDLX/main.html

CD-ROM

HELPLINE

01685 354726

Sidekick 95 FULL VERSION

Sidekick 95, specially designed for Windows 95, gives you a variety of calendar views including weekly, monthly and yearly displays. If you have to make changes to your plans at the last minute, just drag-and-drop to reschedule, or use the unique viewport to drag a name from the cardfile to the calendar. If you need to take your schedule with you, Sidekick 95 can print pages in popular paper organiser formats like Day-Timer, Day-Runner, Franklin, Filofax and others.

■ Upgrade Offer

Upgrade to the latest version of Sidekick for just £24.99 (plus £3.99 P&P) — that's a £15 saving on the recommended retail price!

➔ **Sidekick 98** has enhanced graphics that make it easier to use, plus a range of new features including Web Publisher, to publish consistent calendars and contacts to the web, the vCard/ vCalendar format to drag files in this format directly into Sidekick, and a Windows AddressBook to link to Microsoft Outlook.

➔ **To upgrade**, either phone 0181 875 4437 or fax 0181 875 4401 with your Visa or MasterCard details, quoting order code S98PCW0699. Alternatively, send your name, address and a cheque for £28.98 made payable to Roderick Manhattan Group, to the following address:

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Starfish UK.
Manhattan
House,
123 Disraeli Road,
Putney,
London SW15 2DZ.

*Please allow 28 days
for delivery.*



PCW DETAILS

Platform Windows '95
and IBM PC

Limitations
FULL VERSION

Sales Contact
0181 875 4437

Technical Support

FAQs at www.starfish.com/service/support/sk95.html

Internet Explorer 5



The latest version of the Microsoft web browser, IE 5, includes support for Dynamic HTML, Java, and the

Channel Definition Format (CDF), and adds many new enhancements and features. AutoSearch lets you choose your search engine and display search results in different ways. And the history box now sorts sites by date, site, most visited, or order visited.

AutoComplete displays a drop-down list of matching sites when you start to type a URL in the address bar, and logins to sites are improved as user names and passwords can be saved in the browser. The useful content advisor has been enhanced, making it easier to restrict access to sites based on content.

PCW DETAILS

Platform Windows
95/98 and NT4

Limitations
FULL VERSION

Sales Contact
0345 002000

Technical Support

FAQs at
www.microsoft.com/windows/ie/Support/default.asp

Y2000 RTC



Run the Year 2000 RTC diagnostic tool from the CD to test if your PC's

Real Time Clock (RTC), BIOS (Basic Input Output System) and System Clock are Year 2000 compliant. [Note — the program will not fix any problems.] If you detect a problem, Senseware is offering the solution software at a special price through this month's PCW, for one month only:

➔ **Y2000RTC Network Version client access licences** (minimum 5 users) at £17.95 per user.

➔ **Y2000RTC single standalone PC licence** at £14.95 per licence.

Please call Senseware on 01689 814556/7/8 and quote reference PCW 06/99KM.

THIS IS A LIMITED OFFER GIVING SAVINGS OF UP TO 50% OFF THE NORMAL CORPORATE PRICING. All prices exclude vat & delivery.

PCW DETAILS

Platform Windows
3.1/95 and 98

Limitations
Diagnostics tools only
(not a fix)

Sales Contact
01689 814556/7/8

Technical Support
01689 814559

Quicken 6 SE FULL VERSION

Quicken lets you track your day-to-day transactions in a register that looks just like a bank statement, with each transaction being categorised, letting you create reports and graphs that show you where you spend your money. Balance your accounts in minutes, print cheques, keep accurate tax and expense records, and even track VAT for a business. Quicken even comes with multimedia tutorials to help you use the program efficiently.

• *Note for existing Quicken users:*

It is NOT recommend that you install the version of Quicken on the CD onto a machine where an older version of Quicken is already in use. It will upgrade your existing data files to Quicken version 6 and you will then need this or another current version to access them. If you're currently using an older version, try the version from the PCW disc on a different PC first, or call Intuit on 0800 585058 to discuss upgrade details.

If you installed Quicken 6 from the May issue of the CD, you will need to re-install the software from this month's disc to access the multimedia tutorials. To do this, follow these instructions:

- ♦ Firstly, back-up your current data files to a different location than the default folder. Quicken helps you to do this: from the FILE menu of your current Quicken installation, select BACKUP and follow the on-screen instructions to copy the files to a safe place.
- ♦ To remove the existing installation, click on 'Control Panel' from 'Settings' in your 'Start' menu. Then in the window that appears, click on the Add/Remove programs icon. Scroll until you find Quicken 6 SE. Click on it to highlight it, and click on the Add/Remove button. Click 'Yes' to confirm. This will uninstall Quicken from your PC.

Registering:

You may use this software a number of times before you have to register it. You can either register via your modem on 01932 578525 or via the phone on 0800 585058 (this is the preferred number; the actual software also indicates 0800 0727433 as a telephone registering number). If you are calling from outside the UK, please call +44 1932 578433. After supplying name and address information, you will be given a registration number which you must enter to continue using the full product.

- *This offer is not available in South Africa.*

- ♦ To reinstall Quicken 6 SE from the June 99 CD, go to Quicken in Featured Software, or run...
<cd drive>:\SOFTWARE\FEATURED\APPLIC\QUICKEN\Install.exe from Windows Explorer.
- ♦ Once Quicken is re-installed, you will have to restore your backup files. From the FILE menu, select RESTORE and find the folder where you backed up your files. After verifying that you want to copy selected files, your backed-up files will be restored and automatically available each time you start Quicken in future.
- ♦ Tutorial multimedia files are available by clicking any of the tutorial icons from within the program. Just make sure the June CD is present in your CD drive when you run Quicken 6 SE to access the sound and video.



■ **Upgrade Offer**

Intuit, in association with PCW, offer you

the opportunity to upgrade to Quicken 98 Deluxe for just £44.95 including VAT, post and packing. Extra features include:

➤ **SmartAlerts** to prompt you when a specific share hits a certain price or if you're about to exceed your overdraft.

➤ **Faster, easier invoicing** as an integrated feature with three available invoice formats.

➤ **QuickTax '98** to complete your self-assessment tax return in minutes.

➤ **Payslip Wizard** to keep track of your gross earnings and key deductions.

➤ **Online Currency Rate Download** to download share and unit trust prices at the click of a mouse,

- To upgrade to Quicken 98 Deluxe, just call Intuit on its hotline number 0800 585058 with your debit or credit card details.

PCW DETAILS

Platform Windows 95
Limitations FULL VERSION
Sales Contact 0800 585058
Technical Support None available

Technical information to help you use the CD

✓ **How to use the CD-ROM**

Put the disc into your CD drive:
Windows 95 If you've got Windows 95, the PCW interactive loader will appear on your screen. If your CD doesn't autoloading, go to Start/Run and type in <CD Drive>:\pcw.exe
Windows 3.1 From Windows Program Manager, choose File/Run, then type in <CD Drive>:\pcw.exe and press enter.

✓ **System Requirements**

You will need a PC running Windows 3.1 or Windows 95. The disc will run under Windows NT but functionality may be reduced. Please check individual products for specific system requirements. For best results, run the CD on a Pentium PC with at least 16Mb of memory.

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HelpLine Returns
Unit 5, Triangle Business Park
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Merthyr Tydfil
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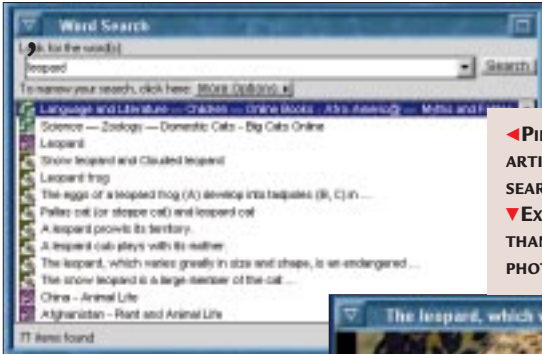


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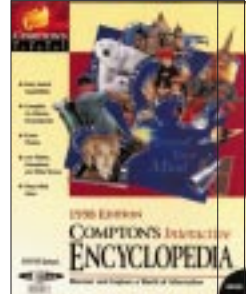
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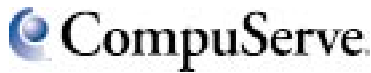
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Technical Support None available

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Demon Internet

■ **To find out** if your cover disk is the Lucky CD, run Demon Internet's FREE 30-day trial online registration from the disk. Once Demon Internet has processed your details, you'll see a message informing you if you're the winner.

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- Experienced Helpdesk support, 24 hours a day, 365 days of the year, on a local-rate 0845 number.
- Access to fast, dedicated online games servers.

Full-time membership costs £10 per month (£11.75 inc VAT) with a one-off joining fee of £12.50 (£14.69 inc VAT). If you decide Demon Internet is not for you, call the Demon Internet Sales & Enquiries Team on 0845 272 2666 during the trial period, and they will cancel your subscription.

*Demon provides 0845 numbers for connectivity, described by OfTel as 'BT local call rate'. Contact your telephone company for details of their pricing structure. Demon Internet Standard Conditions of Use apply. Calls to the Sales & Enquiries Team and the Technical Support Help Desk may be monitored for training purposes.

■ What do I need for the free trial?

All you need is a PC with Windows 95, 98 or 3.1, a modem installed and connected to a phone line, and a credit card (don't worry — your card will not be charged if you decide to cancel your Demon Internet account before the 30-day trial period has elapsed). Just put the disk in your CD-ROM drive and follow the on-screen instructions. If you need any help, simply call Demon Internet's Technical Support Help Desk on 0845 272 4244.

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Melissa shoots into top ten

The Melissa macro virus hit the UK Top 10 within five days of having been discovered. It spreads by sending itself to the first 50 names in a victim's email address book. Melissa has no malicious payload other than passing on a list of smutty sites, but it was reported to have overloaded several mail servers. A 30-year-old New Jersey programmer, having been accused of spreading the virus, is expected to face a trial by grand jury.

Satellite service

EasyNet has launched satellite-based web access for £49.99 (ex VAT) per month or £599 (ex VAT) a year.

- See next month's PCW.

Non-Wintel devices put Microsoft on the defensive

Microsoft has outlined what looks like a strategy to counter the proliferation of smart non-Wintel devices.

Some of these, highlighted this month, were unveiled at Germany's giant Cebit show. Few think they will displace the PC, but many vendors believe that cheap, task-specific smart devices are more likely to hit a true mass market.

Microsoft president Steve Ballmer, in a keynote at the WinHec hardware conference, announced an EasyPC initiative to simplify the PC. He said users had to be able to expect

to simply switch on and go. But he claimed the Wintel architecture would reach beyond the desktop and into home appliances. 'The PC of

More Cebit news on pages 28-31, 33, 42 & 43

tomorrow will be able to be general purpose,' he said. 'But if the customer wants a single-purpose machine, we will give it to him.'

His view is shared by Cyrix, which plans a series of specialist x86 designs (see p33).

Ballmer also announced that Windows 98 will get at least two more upgrades until

it is subsumed into a new NT-based operating system some time after 2000AD.

One of these, dubbed Windows 98 Second Edition, will arrive this autumn and cost \$89. It supports Device Bay — another move to simplify PC use.

Meanwhile, Corel is pushing Linux as a Windows alternative for the desktop (p34) and UK computing pioneer Sir Clive Sinclair plans a low-cost Linux portable.

CLIVE AKASS

Additional reporting by Robert Juman-Blincoe and Dominique Deckmyn.

Home, home on the always-online range

IT vendors, if not users, are waking up to the huge changes that will occur with the emerging **fast, home data links**. The speed of xDSL and cable modems is only the half of it: the fact that they are always on is at least as important.

One likely application is surveillance. Burglar alarms are often useless because police are swamped by false alarms. But if you are online, you can have a webcam snap an intruder and send you an instant alert — with picture. You can even keep a remote eye on your kids or babysitter.

The £159 (ex VAT) Moviestar pack (pictured), although targeted at companies, shows the idea. It allows you to



link as many as four cameras to a PC, and a £399 (ex VAT) professional version will send video events across a network.

IBM is so excited by the prospect of home links that it is proposing a kind of data mains box which can talk to home devices using any of a variety of standards. The Java-based Open Service Gateway,

unveiled at the Cebit show, could conserve energy by allowing power companies to control appliances to cut consumption at peak times. IBM, which has produced reference designs, reckons companies would save enough to warrant subsidising OSG boxes and give their users discounts on electricity bills.

Various systems are being suggested for distributing data around the house. Among them, using the new IEEE 802.11 wireless networking standard, is the Zoom radio LAN system launched here last month (see p70).

ATM 0191 4145929, www.atmltd.co.uk

Ericsson opens up a new mobile Epoc



Hands up those who thought the handheld on the left is a Psion Series 5.

You're wrong — but you're not

completely wrong.

This machine from **Ericsson**, previewed at Cebit, is one of the first fruits of the Symbian alliance between **Psion** and the world's three leading mobile phone vendors — the other two are **Nokia** and **Motorola**.

Psion unveils mini notebook
See page 29

The Ericsson MC218 has the same body as the Series 5 and uses an updated version of its Epoc 32 operating system, now owned by **Symbian**. The new

Epoc boasts a Java Virtual Machine, enabling it to run Java applets.

All the rest of the hardware is Ericsson-designed and, predictably, it includes GSM cellular connectivity via the mobile phone pictured (left).

Ericsson also showed the Epoc-based R380, its answer to the Nokia Communicator, a combined organiser and mobile phone.

• See Cebit trends on pp42 & 43, with a picture of the R380.

Travellers face filth check

Notebook users will soon face **routine 'smut checks' at Customs**, according to a forensic software developer.

The check could open them to prosecution, even for deleted files, said George Stevenson, MD of Vogon International.

Vogon began as a data recovery specialist, but got into forensic work when it was asked to develop a package to enable easy identification of pirated software. Its method, based on a database of file signatures, was then adapted to identify

pornography — particularly child pornography. It is already in use by police.

Stevenson said he 'has reason to believe' that Customs will run his software on notebooks coming into Britain. 'They'll ask you to switch on the machine. Then they will slip in our disk, run the check, and if it goes *ping, ping, ping* you are likely to get your collar felt,' he said.

The software can detect zipped and deleted files, but only some encrypted forms. The signatures it uses are all of pornography that has featured in court cases. 'Some

of the material...is nightmare stuff. They have stuff where children have been murdered live...they have been murdered and videoed. A lot of that stuff is coming out of the Far East,' said Stevenson.

He agreed that there was a chance of innocent people getting caught with files others have left on machines, perhaps from a company pool used by several people. But he said: 'The sort of people Customs are looking for have tens of thousands of pictures on their disks.'

CLIVE AKASS

Vogon, www.authentec.co.uk

Cebit shorts

▶ PDA PIGGYBACK

This card-sized Rex Organiser uses software by Starfish, recently bought by Motorola. No surprise, then, that this version, called StarTac, is designed to clip on to a Motorola mobile phone. No details yet on price or release date
www.motorola.com



▶ SHARP MOVE

Sharp's VN-EZ1 viewcam is small enough to cup in your hand and stores on a 32Mb smart card up to one hour of MPEG 4 video which is designed for low-bandwidth lines. Not for video freaks perhaps, but it has many uses. (See page 71.)



▶ VOICE-ENABLED WEB

Conversa showed its speech-enabled browser which lets you navigate the web by voice alone. A voice-enabled version of Microsoft follows Outlook later this year.
www.conversa.com

▶ PHOTODISK EUROPE

PhotoDisk Europe asked us to point out that its free image library at www.photodisk.com has no connection with Kodak, as stated last month.

Product of the show

After all the talk about smart devices, few innovative ones have yet appeared. Which is why *PCW News* awards the **C-Pen from C Technology**, based in Sweden, its 'Product of the Show' award at Germany's Cebit. The pen is essentially an organiser, capable of synchronising its data with your PC. But it packs a 50-frame-a-minute camera which can scan printed text at 100 characters per second; OCR software translates this into machine-readable text, pumping it into specific fields of a contacts database. You can even write with it, and it will have a go at translating your scrawls into text. The 100g Strong ARM-powered device packs 8Mb of RAM and can store a claimed 3,000 pages of text. The current model uses infra-red to talk to a PC, but a version using Bluetooth was demonstrated at Cebit. The C-Pen costs £292.58 (inc VAT). See also, *Gadgets*, page 71.



MegaPixels 01425 674617; www.cpen.com

Now it's the virtual Y2K bug...

What with people taking off to the wilds to escape a predicted global collapse of civilisation, you'd think the Y2K industry has no need to find yet another reason for people to buy beat-the-bug products. But find one the industry has. It's called the Crouch-Echlin effect, after its 'discoverers', though it might be described as a 'virtual bug', as it has its fixes even though the threat has yet to be incontrovertibly proved.

The theory is that Y2K-aware computers will take so long to cope with the onerous calculations at rollover (1+1999=2000) that they might mis-time reading the real-time

clock. We're talking microchances amid microseconds here, but can you afford to take *any* chances if, say, your PC controls the trigger of an atomic missile? No, you can't, say the vendors of a Y2K hardware fix called Cybergeddon 2000. The £69.99 (ex VAT) card also tackles more mundane problems like the Y2K latency bug.

Even Cybergeddon's Richard Nawrocki says he isn't sure he believes in Crouch-Echlin. But to help you sleep easier, he says Number 10 has bought two of the cards.

Cybergeddon Europe 07050 135076



'...finally, this is the **only** product to counter the Brandt-Ebing effect; the tendency of people who have nothing to fear, to worry about not worrying'

GRAPHICS PLATFORMS

Playstation II is more than child's play

The suspense is over. Console gamers of the world unite. **Sony's next generation Playstation has been unveiled** following intense speculation, not least among the near-50 million users of the original version; the best-selling console, ever.

Playstation II will have a DVD drive and is expected to be able to play DVD movies. This alone gives it an edge over its nearest rival, Sega's Dreamcast.

It is powered by what Sony calls the 'Emotion Engine', co-developed with Toshiba and based on the MIPS RISC architecture which is capable of

delivering 16 million polygons per second — over five times more than the Dreamcast. Its floating-point power of 6.2Gflops is well above the 2Gflops attained by Intel's 500MHz Pentium III.

It will run Playstation I games and is expected to have support for PC Cards, USB and FireWire. There are rumours that Citrix is writing software enabling Playstation II to act as an NT client, allowing it to run Windows applications across a network.

With such impressive specifications, its success is not in doubt. What is uncertain is its ability to stay ahead of

the competition. When the original Playstation debuted more than five years ago, the PC was still in its infancy as a gaming system. However, with the advent of faster processors and dedicated graphics accelerators, the PC is now a versatile games system.

By the time the Playstation II hits the market later next year, new technologies like geometry acceleration may put the PC on an equal footing. So, retaining the attention of gamers may not be as easy as before.

AJITH RAM

● *Is Playstation II the new PC? See page 50.*

Neon challenge to Voodoo

UK company VideoLogic previewed at Cebit its **second-generation Power VR Neon 250 graphics card** which uses technology very different to that of its competitors.

Traditional accelerators, like Voodoo, render not only the visible part of a 3D image but also the hidden elements. This results in a lot of wasted clock cycles and consumes more

memory. Power VR uses clever algorithms to analyse the scene before rendering, which is more efficient.

We managed to get a sneak preview of the new graphics card. Preliminary testing indicates that the Neon 250 (pictured, right) will be much faster than ATI's Rage Fury and only slightly slower than 3Dfx's Voodoo3 3000. Image



quality is excellent. Look out for a full review of the Neon 250 in our July issue. ● *For more on graphics cards, see our group test starting on p176.*

AJITH RAM

VideoLogic 01293 560511

POINT OF VIEW

Wiring up Dr Who

Sylvester McCoy, who many consider to have been the best Dr Who, asked me to help him get onto the internet. Our paths have crossed occasionally since way before his Tardis days, so I see him as a person rather than as his most famous role. Even so, fame has a habit of blurring the distinction, and so it turned out.

Sylvester occupies the upper floors of a house overlooking Hampstead Heath. It's a warren of a place, a clutter of books and mementos — exactly the kind of home you'd expect Dr Who to have. An overloaded coat-stand leaned across the doorway of the room where he keeps his Power Mac, as if hiding some secret recess of the Tardis. Each time we entered or left we had to lift it up... each time, it crashed back behind us.

Sylvester, a technophobe, said proudly that he had managed to plug in the leads for the internal modem and had bought an extension to reach to the

nearest jack. His main concern was to get email so there seemed little point in using a paid-for service. A ring-round of the free services revealed that, at that stage, few offered Mac software. An exception was Virgin, so that was what we went for.

The software installed itself with no problem but we couldn't get a squeak out of the modem. Now, I have to say that even though I use a Mac and a PC side-by-side at PCWTowers, I am less than expert at troubleshooting a Mac. I tried everything on the control panel without success and then decided to examine the phone leads, which often go faulty. 'Have you got a spare phone I can plug in to test the lines?' said I.

'No... oh wait a minute, yes I do,' said Sylvester. He ducked under the coat-stand and re-emerged a couple of

minutes later with a waist-high Tardis, complete with police phone.

Life imitates art: here I was with Dr Who, using a Tardis to test a line. It tested okay and I was baffled. 'At some time when you use computers, you are going to be faced with a problem to which you know in your bones there's a really easy answer,' I told Sylvester. 'When you find the answer, you kick yourself and you never forget it. The problem is that it can take hours, or even days, to find it.'

I'd been there two hours. I was getting a headache. I wanted to go home. 'I'll try one more thing. It must be the modem. I'm going to open up the box and have a look,' I said.

Mac users among you may have guessed what I found: inside was just one card, a network card using a jack similar to a phone jack. *The Mac didn't have a modem.* We bought one the next day and were on the net within seconds.

Clive Akass



and a Time Lord seek the elusive obvious

Psion thinks big at last

Psion showed no less than **three new models** at Cebit — tucked away, unsung, in the industrial computing hall. Two were pen tablets, with half- and full-sized screens, targeted at niche applications. These are of the point-and-tick form-filling variety, so handwriting recognition will not come as standard. The third model was what many (including your reporter) have long been urging Psion to make: a larger version of its handhelds.

The prototype, codenamed Jedi, is the size of a mini-notebook and has a leather covering (left), a memory card slot on one side and a PC Card slot on the other. At the rear is an infra-red link.



Psion has released few specifications, but the machine is said to have 24Mb of RAM and packs a Java Virtual Machine with its revamped Epcoc 32 operating system, now owned by the Psion spin-off, Symbian. GSM mobile connectivity is likely to be an option, as many of Symbian's partners make mobile phones.

Steven de Saullés, senior designer at Therefore, which designed Jedi and the Psion handhelds, said that one aim was to match the stability of the prizewinning Series 5 as a typing platform.

'We wanted something that could go up against the CE machines. We also wanted something that you did not need to put into a case,' said



de Saullés. 'That's why we put the leather on. It's cleverly designed so that it tucks in when the lid is lifted.'

He agreed that price will be critical. A big argument against larger CE machines like the Jornada is that they are neither fowl nor beast: they are too expensive to hit a mass market as mobile adjuncts to a PC, yet they aren't very much cheaper than a fully-fledged Windows sub-notebook.

'I think that's why Psion is going for the corporate market, which is not so price sensitive,' said de Saullés. Psion is keeping quiet about prices but 'under £800' has been quoted, which would put it up smack against the Jornada.

High-pricing was one reason for the failure of Psion's previous attempt to launch a sub-notebook, in 1991. This year, it is expected to bring out a colour version of the Series 5 with the new Java-enabled Epcoc 32 operating system.

CLIVE AKASS

● *Cebit trends* — see pages 42 & 43
Psion 0171 262 5580

Cebit shorts

1GHz PC FLIES BeOS

Fujitsu embraced multiple operating systems on its stand, although interestingly neglected CE on its portables. The company will happily sell you a system with Linux, which it believes will have captured a 30 percent share of the server market by the end of this year. Sexiest of all was a PC boasting a pair of 500MHz Pentium IIIs, running BeOS extremely quickly. Multiple video streams and rendering windows were shown running simultaneously without breaking into a sweat. Multimedia is bread and butter to BeOS, and AV-enthusiasts should certainly look into this alternative to Windows (see our operating system feature, next month).

GORDON LAING

MAC-TO-PC SWITCH

Using a Mac and a PC side-by-side on the same desk can be confusing as well as crowded. Apex PC Solutions, which has just opened a UK office, sells a \$224 box which allows you to use the same keyboard and monitor for both. Apex's focus is on console switching, which allows administrators to plug a central keyboard and monitor into any server on a network.

Apex 01752 708896

...but there's hot opposition

Hewlett-Packard's Jornada proved that Windows CE was a sensible operating system for notebook computers (PCW Feb '99). The combination of solid-state reliability and long battery life in a larger and more comfortable form factor than a traditional handheld appeared to be a winning idea, although since its launch few manufacturers have followed Hewlett-Packard's lead. **Sony** and **Fujitsu** produce tiny sub-portables, but both believe users desire full Windows compatibility and

describe CE as a proprietary OS that few would find useful. Fujitsu showed a touchscreen version of its LifeBook B110, with a display that didn't look any dimmer than its counterpart, for around £1,000, while Sony gained mileage with its new C1 sub-portable and 505 ultra-thin notebooks.

This hasn't put off **Samsung**, which showed its iZZi Pro, a classy-looking CE sub-notebook with over ten hours' battery life. Its spec is not dissimilar to HP's Jornada, with a 640 x 480 8.2in DSTN display, 16Mb RAM and weight of only 1kg, but the iZZi Pro looks smarter, feels sturdier, and is expected to sell for around £650. Handhelds are still popular, too. **Philips** showed the new colour version of its CE-based Nino (left) which goes on sale this month.

GORDON LAING





Laid back at Cebit

No need for expensive wide screens when you wear these display specs which are said to give cinema-quality pictures. The **Eye Trek**, from **Olympus**, is designed for TV or video pictures. Olympus says the Eye Trek will be on sale throughout Europe this month for about £460.

● **A real-time MPEG-2 encoder** shown at Cebit could lead the way to low-cost DVD-based video editing and compression systems. Apollo Expert, from DV Studio Technologies, costs less than \$2,000, compared with up to \$250,000 for a professional system with Dolby Digital audio. MPEG-2 has become the primary video compression format. A key feature of Apollo Expert, according to DV Studio, is its ease of use and installation. Werner Glinka, Hitachi America's senior director of marketing, said: 'The Apollo Expert from DV Studio Technologies is a big step in the convergence of digital media products for professional and consumer applications.'

JAN HOWELLS

The slim side of Cebit

Monitor displays at Cebit were predictably flat and thin, with conventional CRTs often relegated to secondary presentations. Virtually every major stand featured **gas plasma display panels** (PDPs). Most were rebadged Fujitsu models — even those shown by Sony which is still developing its competing PALC (Plasma Addressed Liquid Crystal) hybrid plasma/LCD technology.

Oddly, Fujitsu's largest plasma panel measured 42in across its 16:9 diagonal with VGA resolution, whereas Pioneer, Philips and NEC showed off huge 50in 16:9 PDPs with 1280 x 768 resolution.

Pioneer exhibited its 50in PDP using Microfield Graphics' SoftBoard 501, allowing a presenter to use it as an electronic whiteboard. This system, with software, costs \$32,000 (\$10,000 more than a 40in version). Pioneer's bare 50in PDP sells in the UK for little less than £10,000; a 42in VGA PDP weighs in at about £6,000.

Fujitsu showed a 25in 4:3 PDP monitor with 1280 x 1024 resolution. Plasma panels are very difficult to manufacture with fine pitches, and the only

easy way to increase native resolution is to build a larger display. Considering most 42in PDPs feature only VGA resolution, a relatively compact 25in PDP with SXGA is technically impressive. Fujitsu hopes to sell it towards the end of the year for around £8,000.

Also expected towards the end of the year is Samsung's 30in TFT display with a resolution of 1600 x 1200. Samsung claimed it would be a competitor to 40in PDPs, although it had no idea of price. A spokesperson did reveal that because each panel needs an entire mother-glass to itself, production failures could be as high as 95 percent.

Sony had a wide range of LCD and CRT monitors on display, the latter based on its flat FD Trinitron technology. By the end of the year, Sony's entire PC CRT range would use FD tubes, except none would be made at its Welsh plant.

The latest TCO-99 standard for safety, ergonomics and recycling has reassuringly been adopted by most major players.

GORDON LAING

www.softboard.com

Microdrive time in Silicon Valley

More than 100 vendors have signed up to use IBM's 1in microdrive, created at the Almaden Labs just a stone's throw from my home. The 170Mb version ships this summer, and the 340Mb by the end of the year.

The drives will end up in smart cellular phones, handhelds, electronic books and digital still and video cameras. We could even see them in home appliances such as web phones, games players and surveillance systems. We are finally getting closer to having PCs that start up as fast as televisions.

A new, Quick-Start PC design from Intel, Microsoft and Toshiba includes an 'advanced configuration and power interface' which allows hardware and software to share information and go into a deep-sleep mode with minimal power drain.

Windows 98 has code to handle this, but few PCs implement it because more costly ROM and RAM is

required. Some should be out this year, though. This is great news for users and is long overdue.

IBM's new 333MHz PII-powered ThinkPad 570 is worth a look if you are considering getting a sub-notebook. It is lighter (less than 3lb) and thinner than the 560, with a battery life of at least three hours. But its big selling point is that it sits on a docking station, with bays for a floppy or CD drive which in effect turns it into a full-sized notebook which looks remarkably like the popular ThinkPad 600.

The potentially award-winning design sets IBM apart once again, just as its original ThinkPad set the mobile market on end. It will cost between \$3,000 and \$4,000 and should be on sale by the time you read this.

Tim Bajarin



letter from Silicon Valley

PROCESSORS

Cyrix PADs out image

Chipmaker Cyrix is going for Intel's soft underbelly with a range of highly integrated chips targeted at a class of mobiles it cleverly calls **Portable Access Devices**, or PADs.

The chips will follow the lead of Cyrix's MediaGX range, which integrates audio and graphics functions into the main processor.

Rather than going for the Holy Grail of a PC-on-a-chip, Cyrix plans a series of device-specific processors with different function sets packed around the same core. This is common practice with cores from the likes of MIPS and (see below) ARM. The difference is that Cyrix retains the x86 architecture. 'This will make development very easy because the skills, software and tools are already out there,' said Steve Tobak, world marketing manager at National Semiconductor, which now owns Cyrix.

In the pipeline are PADs for music, personal banking, students, and motoring applications such as routing. Best known is



the WebPAD (pictured, above) for wireless web access which Tatung will make and ship some time this year.

Cyrix has not abandoned the other end of the market, though. At Cebit it was showing its 366MHz MIII, with 400MHz and 433MHz to follow by the autumn.

www.cyrix.com

SUPER-FLOPPIES

Storage scramble

Sony has quietly **withdrawn** its 200Mb HiFD superfloppy drive because of head-crash problems. It will be back on sale in the autumn.

At the Cebit show, however, Sony displayed two prototype versions thin enough for a notebook — something which to date only the rival 120Mb LS-120 drive has claimed as a unique advantage.

Samsung offered a third contender at Cebit, unveiling its new ProFD super-floppy which reads 123Mb cartridges.

Samsung claims that first units will be with PC builders in three months' time at \$35 each, and that the price will drop to \$20 within six months, which would make them cheaper than the LS-120 drive.

All these drives read standard floppies, although the LS-120 has a market lead. **Panasonic** has just a double-speed LS-120 drive.

Lance Quantrill, UK marketing manager of **Imation**, which makes LS-120 media, doubted whether the HiFD would succeed. 'It has come too late for the market,' he said.

The clocks run fast at Cebit

Intel and AMD both showed off fast versions of their leading edge processors at the Cebit show.

Intel, which launched 500MHz and 550MHz PIII Xeon processors at the show, boasted a PIII clocking 800MHz. Both are designed for multi-processor servers and high-end workstation applications.

Curiously, to show them off, Intel eschewed the usual flashy graphics in favour of a data tracking program called Enfield Tracker Pro.

This, although visually tedious, impressed me, as I had recently tried this program out on my humble 166MHz office PC and then took it off because it ran far too slowly. Clearly we are beginning to get software which requires these fast processors.

AMD, which has been hit by low yields and low prices, showed a K7 running at 600MHz. The first K7 was due to ship in June but the launch is now likely to be delayed. The chip uses an electrically remapped Slot 1 and the same 200MHz bus used by the Alpha chip.

CLIVE AKASS



Two strings to Intel's bow

Intel has a two-pronged approach to the growing demand for mobiles. The first, codenamed **Geyserville**, is to increase power efficiency to reduce battery drain. It will switch operating voltage and clock rate on-the-fly so full power is drawn only when needed or when a mobile is plugged into the mains. The result will be a PIII mobile chip clocking 600MHz-plus, said Intel. The other approach is the fast, power-efficient **StrongArm** range. Intel has started making the SA-1110 used in HP's Jornada 820 handheld.

● Intel has introduced 266MHz and 333MHz versions of the Celeron mobile.

Drive recall

Omega has recalled a number of its 60,000 power units which had been sold with 1Gb and 2Gb Jaz drives. If you bought a Jaz drive between 1st September 1998 and March 1999, you are advised to call customer support or check out www.ionega.com/support/recalls/index.html.

Days of WINE and Linux

Corel's **support for Linux** might help propel this offbeat OS onto our desktops. Tim Nott reports.

After the party, the WINE flows. Despite a disappointing last set of figures, the Corel Corporation had much to celebrate in April. First, it is the tenth anniversary of the company's flagship graphics program. Second, it called press and partners together for the official launch of Draw 9 and WordPerfect Office 2000. Third, it hosted the annual Design Contest Gala, where digital artists from all over the world chased (US) \$250,000-worth of prizes.

The party took place in the Corel Centre — a huge stadium normally used for staging ice-hockey matches. Category winners hailed from Bosnia, Germany, Russia, Greece and Canada, with Brazilian Aduino Dos Santos taking the Best of Show award. But for those in pursuit of more serious news, the story behind the stories is the Corel Linux initiative.

Last May, Corel pledged its support for the Linux platform, and in December released a version of WordPerfect 8 to run under Linux. It has been available free from the Corel web site and has so far attracted 900,000 downloaders. Although it isn't possible to tell how many of these successfully retrieved the entire 60Mb-worth of files, this figure is extremely encouraging, both for the Corel Corporation and for the Linux community.

Although implementations of Linux such as Red Hat and Caldera are widely used server platforms representing an estimated 50

percent of web servers, Linux on the desktop has been seen as strictly for enthusiasts. And this is what Corel seeks to change. The Linux community has over 10,000 developers working cooperatively on an open standard. Corel's programming workforce represents a significant although not dominant proportion and, for connoisseurs of such things, is following the Debian model with the KDE graphic user interface on top.



▲ THIS IMAGE, CALLED CONTEMPLATION, WON THE COREL WORLD DESIGN CONTEST. IT WAS CREATED IN CORELDRAW BY ADAUTO SANTOS OF BRAZIL

The greatest hurdle to the success of a new operating system is having the 'killer' applications to run on it. This is one reason why Windows and the Mac OS succeeded, while OS/2 did not. By the end of this year a Linux version of WordPerfect Office 2000 should be available, with Draw 9 following early in the new year. However, two software bundles, albeit major ones,

do not constitute much of a choice, and this is where WINE, another open-standard, Corel-supported

How is Unix going to win our hearts, minds and desktops?

initiative, comes in. WINE stands for 'Wine Is Not an Emulator' which is, at least in layman's terms, exactly what it is: software that will run Windows applications under Linux. However, unlike conventional emulation software which re-routes each call to the operating system on an *ad hoc* basis, WINE strips out the entire set of WIN32 calls as the application is loaded and drops the program straight into the Unix environment. This 'recompile on load' approach results in a far smaller

performance hit, and as its devotees claim that Linux is faster than Windows anyway, should still match or outperform the same application on similar Windows-equipped hardware.

There's still a lot of work to do. In terms of a user-orientated desktop OS, developers are addressing issues such as plug-and-play drivers and integration with Windows networks. The WINE developers have still to find a substitute for OLE (Object Linking and Embedding), a Microsoft proprietary technology on which essentials such as cutting and pasting between applications depend. Nevertheless, Corel is hoping to have a Linux-WINE OS available by the end of this year.

The big questions are, why is it backing Unix in this way, and how is it going to win our hearts, minds and desktops? The first is all about competition and choice. If Linux can be offered as an alternative to Windows, then Corel will be ahead of the game with native Linux applications. Secondly, it perceives a market for a cheap, or preferably free, OS. As PC prices continue to sink below the \$500 mark, then the \$65-or-so represented by a Windows 98 licence becomes significantly expensive.

As for how, Corel has already demonstrated its bundling skills by moving a rung up the supply ladder. A deal with Chips Inc. means that 18 million motherboards will ship to PC manufacturers with a copy of WordPerfect Office 8 on CD-ROM. This is not perceived as a direct revenue-generator in itself, but if just ten percent of buyers upgrade to 2000, that's a highly desirable bunch of sales.

Corel is spoilt for choice, then, on ways of delivering Linux and WINE to our desktops. It could go via a similar bundling deal, giving real consumer choice to PC buyers. For the more enthusiastic it can offer the free download approach, and third, it can bundle the OS with the product. Though this last might sound a little unconventional, PC veterans may remember when Aldus PageMaker came with a then-obscure operating system add-on called 'Run-time Windows'.

Card X marks the spot for joint USB/1394 port

A PCMCIA specification called Card X is about to turn the PC Card slot effectively into a combined USB and 1394 port. The Card X slots are expected to be used for modems, network cards, DVD and disk drives, PCMCIA chairman Anthony Wutka told a Cebit press briefing.

The top data rate for 1394 (aka Firewire) is 800Mbit/sec but is expected eventually to reach 1.6Gb/sec within three years. The PCMCIA's current-generation 32-bit Cardbus slot can cope with 1Gbit/sec.

Card X devices will fit into a standard slot but they will be invisible to it because two voltage-detect pins are grounded low. Other pins are remapped for 1394 and USB links, and eight spare ones are used to exchange configuration information when the card is plugged in.

PC Cards will be used to give set-top boxes access to different services; Card X would add the ability to connect to home hi-fi and computer systems.

The first Card X devices are expected next year. www.pc-card.com

Memories are made of this

Disks and RAM modules grew bigger and faster at Cebit, with Seagate claiming the world's largest hard disk at 50.1Gb, available in U2W SCSI or FibreChannel flavours. But several other vendors with 'mere' 50Gb drives were piped to the record.

Samsung showed a 1Gb memory module, while Sony plugged its Memory Stick with demos using digital cameras, portable stereos and an



LCD picture frame. Memory Stick looks to the outsider like a taller, thinner CompactFlash card, with expected prices of around £50 for 16Mb — roughly comparable to CompactFlash.

GORDON LAING

Sentec brings real-world links to its sensors

Sensors and transducers link the real world to the information world, and one growing firm has focused on this interface with a stream of innovations. Sentec was formed just over two years ago by Andrew Dames, previously head of the sensors division at consultancy Generics.

Sentec has already spun out another company, Holotag (now seeking funding) to exploit a magnetic data tagging technology of which I will be writing more in a future edition. And in Sentec's pipeline is a system which faxes documents as soon as they are dropped into the in-tray. A prototype is up and running, and Sentec is talking to major fax manufacturers about it.

With interactive digital TV in mind, Sentec is also working on telepointers, which combine the functions of a remote control and mouse. Its low-cost design has drawn the attention of a number of set-top-box manufacturers. Sentec has used a number of technologies, including magnetic measurement and cheap optics, which should bring down the price of the devices.

Alternatives at present are handheld trackballs or accelerometer-based mice — both expensive, and using infra-red or

radio datalinks. Sentec reckons it could bring out a product for about a fiver.

'We're using the smallest amount of technology possible,' says Sentec partner, Dr Edward Colby, who heads the telepointers project. 'The real opportunity comes from people who've got used to the interactivity the mouse gives you on a computer interface, and who now wish to use the same interface sitting in front of their television in the ubiquitous home entertainment field.'

He believes the field is one in which Sentec's core technology can excel. Colby says the firm is looking at licensing a product in the third quarter of this year.

www.sentec.co.uk

■ If a £20m plus investment in comms infrastructure company Flute is anything to go by, internet service providers and phone users will soon be on the receiving end of price cuts. It seems Interoute Telecommunication (of which Swiss group Sandoz is a major shareholder) is to become a majority shareholder in Flute, which

was started by Pipex founders Richard Nuttall and Peter Dawe.

Flute's goal is to bring down the price of voice telephony by getting a submarine network in place; its dark fibre cable will be snaking out under the North Sea. These will link with Interoute-owned land lines to create a European network.

Both companies are pushing Voice-over-IP, the use of the internet or intranets for telephony. 'There's a lot of synergy in this deal with Interoute,' says Nuttall, 'and we'll be benefiting each others' networks.'

The first undersea cable will link the UK with the Netherlands and Belgium, a second is planned to go north to include Denmark and Germany, and a third and fourth are to loop around the UK coast.

Nuttall said companies using a small leased line to connect offices between, say, London and Amsterdam could instead 'have a resilient connection over a network giving 155Mb/sec — yet the cost would be only 50 percent more than for a 2Mb service.'

www.flute.ltd.uk

Caroline Swift



continues her reports from Silicon Fen

Sun shines only on sign-ups

Companies are jumping on the **free web-access bandwagon** started by Dixon's with FreeServe — and new users are signing up at a rate which is rapidly transforming the web in Britain into a true mass medium.

It is also creating new business models: Rupert Murdoch's *The Sun* is offering access to its new online edition, called the Currant Bun, only to people who sign up to its fee-free access service.

Murdoch, like all 'free' service providers, will take a cut of readers' line charges, but by barring users from other providers he is reducing potential advertising and transaction revenues. Evidently he hopes to gain more by tying some of the *Sun's* four million readers into the Currant Bun portal.

But you don't need to be a global media magnate



to set up a free service. Backbone providers like UUNet WorldCom and BT are offering packages which allow companies to offer access under their own brand, enabling them to maintain a close long-term relationship with customers.

PC vendor Tiny has followed Gateway's lead in bundling access with PCs; Citibank and Barclays are offering customers free access; so are HMV, Virgin,

and, in a joint venture with Yahoo, booksellers Waterstones. Meanwhile FreeServe, which claimed one million active users within a few weeks of launch, is boosting its site offerings with a new educational partwork on its early learning channel. A large proportion of the people signing on to these services are first-time users rather than defectors from paid-for services, FreeServe reports.

Web music hits bum note as IFPA sues over MP3 files

A Norwegian partner of US search engine Lycos is being sued as part of an **all-out war against web music piracy** — on the grounds that it provided links to sites offering illegal copies.

The International Federation of the Phonographic Industry accuses Fast Search & Transfer ASA of mass copyright infringement. It is also considering taking action against Lycos in the United States.

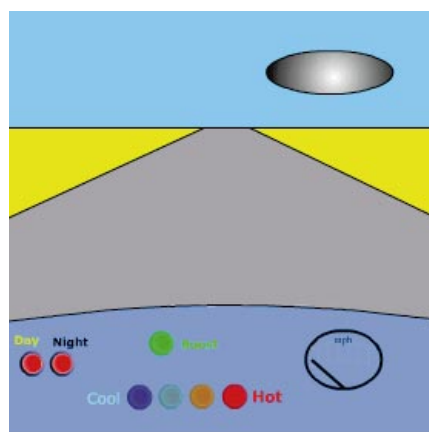
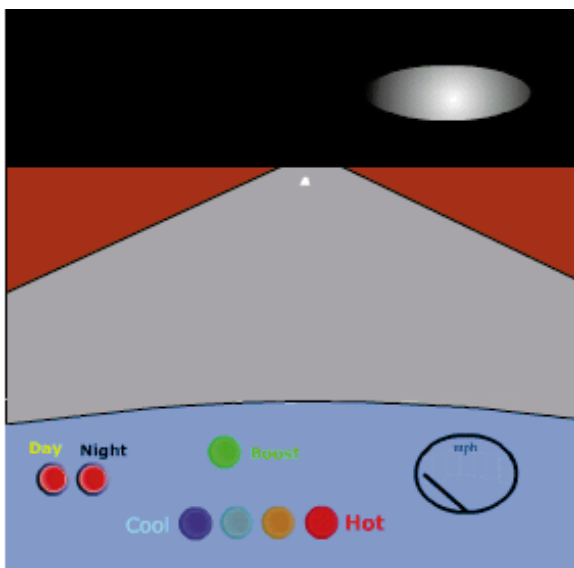
This is the first time a search engine operator has been targeted in the growing campaign against pirate music held in highly compressed MP3 files. Fast's engine software searches out MP3 files worldwide continuously for these files, and stores their addresses in a database. The IFPI claims the Fast search engine turned up virtually no legal MP3 files.

Lycos claims to provide access to more than 500,000 music files at any time. No other search engine provides a similar service. 'This is a threat to the companies who want to build a flourishing legal electronic marketplace,' said Mike Edwards, director of operations for the IFPI.

MP3 compression is posing an increasing threat to the music industry. 'MP3' is second only to 'sex' as the most searched-for word on the net.

Lycos declined to comment.

JAN HOWELLS



Flash music effect turns day into night

These two screens are from a sample Macromedia Flash animation which is driven by music — a new feature of Sseyo's Koan Pro 6.0 computer-generated music package. It includes an application-programming interface which allows musical events to affect the animation: for instance, a

change from major to minor key can switch the graphic from day to night. The reverse transition might trigger a cock crow. Sseyo says the combination of Koan and animation means you can create web sites that never look or sound exactly the same on revisits.

www.sseyo.com32

Court threat to internet freedom

A 'squalid and obscene' Usenet posting has highlighted the tricky position of service providers trying to maintain web freedom.

The posting to soc.culture.thai defamed UK-based computer-science lecturer Laurence Godfrey, but it purported to be from him and gave his email address for replies.

It came from the US but was cached on a Demon server. Demon did not remove it until its expiry date, even though Mr Godfrey faxed the company

to say the letter was a forgery, a High Court judge was told.

Mr Justice Morland ruled that a case against Demon should go ahead, and as we went to press Demon was waiting for the result of an appeal. Solicitor Nicholas Bohm said the ruling meant anyone could get a web publication banned, simply by making a complaint.

A spokesman for Scottish Telecom, which now owns Demon, said: 'It's like someone being insulted in a bar and then suing the pub for slander.'

David Flint, a technology-law specialist at MacRoberts solicitors, based in Glasgow, described the ruling as deeply worrying both for service providers and for users. One answer might be to cache Usenet material in the US — although a United Kingdom court might still deem an internet service provider liable, simply by offering a link.

The ruling can be seen at www.courtservice.gov.uk/godfrey2.htm.

● See our web site, at www.pcw.co.uk, for the result of this case when it becomes available.

Pioneer Cliff returns to web

Pioneer service provider Cliff Stanford (pictured, right) has returned to the internet business less than a year after having sold Demon Internet for £66m.

Stanford kick-started internet use in Britain in 1992 by offering net access via Demon for just £10 a month at a time when the internet was largely the preserve of academia.

He netted £33m from Demon's sale to Scottish Telecom, and injected £15m of the money into a new venture capital company called Redbus with the aim of backing innovative ideas in Britain.

Now, Redbus has invested £4m in a new kind of web-hosting facility located in a highly secure building called Interhouse, situated in

London's docklands. This has direct backbone links from all major telecommunications companies on the one hand, and fast links to service providers on the other.

The idea is that companies can site their web servers in the building, with 24-hour monitoring and power backup, without tying themselves to a particular telco or service provider. Short-term contracts are available so that companies can try the facilities at minimal cost without committing themselves in the long term.

Stanford said: 'A company's web site is its primary window on the world. It's imperative that data has to be close to the internet backbone.'

www.interhouse.redbus.co.uk



short stories

► Milton Keynes may be

famous for its concrete cows but it is the home of the Open University and claims to have one of Britain's most computer-literate populations. Its new city-information web site is aimed at creating a local community, with contributors updating news stories, details of events, and other information using a Self-Publish System provided by site designers Internet Digital Media. Director Brian White said the system uses server-side Java applets which provide speed responses.

► The free-ads paper, *Loot*, has begun a new online auction of secondhand goods. Bids can be made over the internet, or by phone, with prospective buyers allowed a week for the bidding.

► Also going into the online auctions business is Amazon.com, which is hosting sales under more than 800 categories, ranging from antique scientific

instruments to vintage clothing.

► A new web site containing news and information on some of the greatest cities in the world, is soon to be completed. www.worldcities.net will deliver up-to-date news from around the world along with weather forecasts, guides to hotels, tourist attractions, eating out and shopping.

ETELKA CLARK



Clive Akass reports on the trends at one of the best-yet Cebit shows

Europe rules the mobile waves

Cebit, held annually at Hanover, may be the world's biggest computer show but it has tended to be overshadowed by the noisier and sexier Fall Comdex show in Las Vegas. But not so, this year. Computing is undergoing yet another tectonic shift, its biggest for 20 years, and a lot of the impetus is coming from Europe. This is partly because many of the changes involve communications, in which Europe is strong, but there seems also to be a new self-confidence among European information technology firms and with it a new willingness to innovate.

The result of this was a range of new designs and a buzz of expectancy regarding the next couple of years. There are four major trends:

- **The internet** is fast reaching a mass market, creating the need for easy-to-use access devices (see opposite page). New free services (p39) are already pushing usage figures close to the critical mass necessary for an explosion in e-commerce and this trend will accelerate with the take-up of digital TV.
- **Imminent 'always-on' broadband links** to the home will create a market for home networking, security devices (pp26-27) and web cameras.
- **The mobile phone**, also on the verge of a massive leap in bandwidth, is marrying the handheld computer and

putting the internet literally into people's pockets (see opposite page).

➤ **Short-range wireless technologies** like Bluetooth and infra-red allow small devices to talk quickly and share resources. They are spawning a variety of simple, cheap mobile devices which can draw on the power of the desktop and network.

A measure of this new wave of computing is the fact that it has reduced the dominant force of the PC world to the status of an also-ran. Microsoft is still a very big player but this is a market it cannot corner: none of the new mobile devices needs Windows CE to the extent

that PCs need Windows. Many are being made by consumer electronics firms which don't share the vulnerability of PC vendors to Microsoft's strong-arm tactics.

Typical of the new wave is Symbian, which was showing some of its first products at Cebit. This is the company formed by Psion, Ericsson, Nokia and Motorola to develop the Series 5's Epcoc 32 mobile operating system. The partners own 80 percent of the mobile phone market and all but Motorola are European. It may not amount to a European resurgence, but it has certainly given Bill Gates something to think about.



This GPS satellite positioning device (left) with the Kodak DC265 camera shows how devices are getting more intelligent and talking to each other. The camera has its own script language and can communicate with the GPS device via infra-red. The advantage is that you can take a picture and stamp it with a precise time and location. Uses range from military and police work to industrial audits. Connections like this are likely to move to Bluetooth (see below) from next year.



Bluetooth on the move

Cebit was witness to several demonstrations of the Bluetooth radio link which is expected to be the main way mobile devices will talk to each other in the future. One was the smart pen featured on page 27. And **Ericsson** was showing a number of imaginative prototypes including this wireless headset (left) which can talk to a pocketed mobile phone, and a wrist

organiser (also pictured, left) that updates itself automatically when in range of a base PC.

Cambridge-based **Symbionics**, which is now owned by Cadence, showed Bluetooth reference designs and a development kit co-designed by Ericsson, which will allow manufacturers to add Bluetooth to devices.

Bluetooth uses frequency-hopping, spread spectrum radio to transmit up to 1Mbit/sec within ten metres. It could add less than \$10 to the cost of a device. Production models are not expected until later this year.

◀ **WRIST ASSURED, YOU CAN STAY IN CONTACT USING THIS WIRELESS HEADSET AND A MOBILE PHONE**



Web struggles to think small...

The proliferation of web-access devices has created the problem of how to format information for displays as diverse as those on a mobile phone, a TV and a PC.

Nokia and Ericsson both showed mobile phones which use the **Wireless Application Protocol (WAP)** with its use of Wireless Markup Language (WML) for displaying information on small screens. Sagem showed one based around Unwired Planet's pioneering microbrowser, but pages first have to be converted to WML. Nokia announced that it is developing a WAP server which will translate information from company networks for transmission to small mobile devices.

British company, Argo, claims to be way ahead with its Nectar engine and software suite which can strip the essential information and links from a standard web page and reformat them as

WML. It will do the same with data from other sources such as news feeds and databases. The idea is that it sits between the data source and the

web server and translates material on-the-fly into a form suitable for the device requesting it.

Richard Jelbert, chief technical officer, says HTML conversion is likely to be a short-term problem because the web will move on to the very much more powerful Extensible Markup Language (XML). This includes metadata — data about data — which makes it suitable for database links and is designed from scratch for publication on multiple platforms. WML is actually a specialist XML language.

● **IBM, Nokia and airline booking specialist Sabre** claim that they will develop a wireless net phone which will notify travellers of flight changes and enable them to switch reservations.

www.argonet.co.uk

◀ **THIS WAP-ENABLED MOBILE IS ERICSSON'S ANSWER TO THE NOKIA COMMUNICATOR. THE R380 IS A COMBINED ORGANISER AND MOBILE PHONE, THE FIRST TO USE SYMBIAN'S EPOC 32 OPERATING SYSTEM [SEE ALSO, PP26 & 29]**

...but it doesn't look good on TV

This screen (pictured, right) was not seen at Cebit but it shows another aspect of the reformatting problem. It's from **NTL's new Interactive TV service**, launched in Britain last month.

Like most pages designed specifically for TV, it uses large text conveying little information. This is partly because television sets are viewed from a distance, but also partly



because of a lower screen definition — which is why standard web pages reformatted for television never look as good as they do on a PC monitor.

Some — including this reporter — believe that a screen-equipped remote control linked wirelessly to the TV will be used to scan the web, rather than the set itself. This would allow viewers in the same room to surf different sites rather as today people read different newspapers while watching TV.

The NTL Interactive TV service will cost £15 a month, which includes net access and hire of a set-top box.

[NTL 0800 052 1234](tel:08000521234)

Microsoft mobilises CE

Static webphones are one of the emerging new class of access appliances. First models were simple email machines but the latest provide full web facilities.

No price has yet been announced for this elegant IBM Screen Phone (pictured, right) but it will be going into production in the second half of this year. It's ISDN based and boasts 16Mb RAM plus 8Mb flash ROM.

Microsoft demonstrated several CE-based models, which it said would be made by Philips and Panasonic. The company is not leaving the mobile field to the Symbian alliance (see opposite) either, writes Jo Pettitt.

Windows CE marketing manager Greg Levin said the company is working with several mobile-phone firms to produce CE-based smart handsets within a year. He claimed that Symbian could not match Microsoft's end-to-end solution.

'[Symbian] has a great operating system ... but end-to-end provision is what will make this a multi-million dollar market,' he said.



Web challenge to lottery law



A lottery which aims to create 2,000 new dollar millionaires on the first day of the millennium is the latest wheeze to cash in on the boom in web gambling.

The organisers say the **Millions2000** scheme, which also offers a first prize of up to \$50m, could raise \$1.5bn for charities via a foundation based in Liechtenstein and known as the Millennium Fund.

Electrofunco, the firm behind the scheme, is

mounting a legal challenge to the UK National Lottery's monopoly which prevents it promoting the scheme in Britain, although there is nothing to prevent UK punters from placing their bets via the web.

The company will seek a judicial review, on 5th May, claiming that a lottery ticket is a 'financial instrument' and is subject to the European free-trade laws.

Chairman David Vanneman said: 'We are

confident that the restrictions imposed by UK Lottery law...will be overturned.'

A single \$10 ticket, purchased by phone or on the net, allows entries into all the prize draws including a series of draws held in the interim.

The lottery is controlled by the **International Lottery in Liechtenstein Foundation (ILLF)**, which is described as 'authorised and controlled' by the Liechtenstein government. The organisers say that 50 percent of the anticipated \$1bn-plus ticket sales will go on prizes, 15 percent will go to the ILLF for local charities and costs, and 35 percent to global charities.

www.millions2000.com

A bug's-eye view



A new package allows network administrators to track every virtual move of staff who use company net links to visit dodgy sites. The enterprise edition of **Cyber Snoop 3.0** can make a complete audit trail of net activity including news, chat sites, newsgroup access, email and site visits. Pearl Software's package also allows administrators to set different access controls for various users.

Opensoft 01488 681004



Hampton Court is one of four royal palaces featured in a new web site at www.hrp.org.uk. The others are the Tower of London, Kensington Palace, Kew Palace and The Banqueting House of Whitehall Palace. The site will be constantly updated with news of tours and events, including holiday activities.

DVDed loyalties

Rival standards for **recordable DVD** could prolong the life of CD-RW. Clive Akass reports.

Confusion over three rival standards seems likely to delay widespread adoption of DVD read-write drives, expected to become the next-generation of removable storage both for PCs and (replacing the VCR) TV. Two types, DVD-RAM and DVD-R, are already available and prototypes of a third, DVD+RW, were shown last month at Cebit.

DVD-R drives, made exclusively by Pioneer, cost as much as £15,000 until recently and the disks were £50 each. Prices have now fallen (*see table, below*) but remain high.

All writing to a DVD-R disk must be done in a single session and cannot be overwritten. But the 3.95Gb disks can be read by current DVD-ROM drives and are used for professional DVD production and archiving. The read-only data has the status of a legal document. Chris Tampsett, Pioneer's optical-systems product manager for Europe, says that doctors use them to store body scans. 'Hospitals are legally required to keep CT scans for 11 years in a tamper-proof form,' he said.

Pioneer showed a prototype 4.7Gb drive, the DVR-S201 (*pictured*) at Cebit. It will be available once the specification is finalised next month. A rewritable (-RW) version — unfairly called 'minus RW' to distinguish it from '+RW' — will follow when copy-protection issues have been settled. The Minus-RW and DVD-RAM specifications both emerged from the DVD-ROM Forum comprising representatives of more than 120 manufacturers. Backers of DVD-RAM include Panasonic, Hitachi and Toshiba. Drives taking 2.6Gb and double-sided

5.2Gb disks (which must be turned over manually) have been on sale for more than a year; a 4.7Gb-per-side version will be launched this autumn.

DVD-RAM drives are being used both in consumer and business applications. Plasmon showed a DVD-RAM jukebox based on Hitachi drives that can take up to 480 single-sided disks storing 1.2 terabytes. Prices start at £36,000 for a 120-disk model. But it is single DVD-RAM drives, available now for less than £400, which will go head to head with DVD+RW drives when they start to appear this autumn from major vendors such as Philips, Sony, Yamaha, Ricoh and Hewlett-Packard (HP). Both technologies offer random access similar to hard disks, but the Plus-RW camp claims superior performance because of the way data is written and read.

In Minus-R/RW the spin speed is varied so that tracks are scanned at the same rate wherever they are on the disk. This is called Constant Linear Velocity (CLV) and is said to be better for audio-visual data streams. Constant Angular Velocity (CAV), where the spin rate is constant but the scan speed varies, uses disk space more efficiently and is more suited to small, scattered data files.

DVD-RAM uses a slightly different system called Zone CLV in which the disk is divided into tracks of equal length, each of which is scanned at the same

velocity. Plus-RW uses a mix of CAV and CLV, which allegedly provides the best of both worlds. Other claimed advantages are:

➤ **Plus-RW** disks look like CDs whereas DVD-RAM disks are held in cartridges. They can be taken out to use in non-cartridge systems but this voids the warranty.

➤ **DVD-ROM** and DVD video players need only slight modification to be

able to read Plus-RW disks. This is a polite way of saying that many

current models are incompatible, but it is also true for DVD-RAM disks.

The battle recalls that between VHS and Betamax for the VCR market and the stakes in technology royalties are as high. But Mike Matson, general manager of HP's information storage group, pointed out that his company has backed Plus-RW even though it owns none of the intellectual property: 'We believe it is the best technology.'

Peter Molyneux, optical storage product manager at Panasonic, is not impressed. He says unprotected Plus-RW disks will be easily damaged and claims of superior performance have yet to be tested independently. He asked: 'Has anyone given you an RW to test? It's all vapourware. I'll be surprised if they [the RW camp] really bring out their 3.0Gb drive because we'll have a 4.7Gb drive on the market by then. On top of that, it will take them months to ramp-up production.' He could see no problems with compatibility. 'We'll be producing 500,000 compatible DVD-ROM drives a month, and that's not counting what our partners are doing,' he said.

The dispute could prolong the life of CD recordables, according to Petter Nordwall of Adaptec's software products group, developer of the popular EasyCD Creator: 'We are ready to provide software for any of the DVD products. At some point one will be the winner, but that could be a long way off. In the meantime, CD-R and CD-RW is good enough for most people's needs.'



▲ PIONEER'S DVR-S201 4.7Gb DRIVE WILL SOON BE AVAILABLE

	DVD+RW	DVD-RAM	DVD-R/RW
Capacity per side	3Gb drives in 'second half of this year'. 4.7Gb due by next year.	2.6/5.2Gb drives readily available. 4.7Gb next year.	3.95Gb write-once available now. 4.7Gb by summer. 4.7Gb RW possibly next year.
RW mode (see text)	CAV or CLV Random access	ZoneCLV Random access	CLV Write disk at once
Media	Disk	Usually cartridge (see text)	Disk
Media cost	Unknown	£14.95 for 2.6Gb £22.95 for 5.2Gb	\$20
Drive cost	Unknown	Panasonic drive £348 (ex VAT) street price	About \$5,000

Playing with your emotions

Sony's **Playstation II** will deliver graphics that put games onto another level. Tim Bajarin reports.

Developers descended on Silicon Valley recently to get their first glimpse of a new games system that will shake home computing. Sony's Playstation II, although still a year away, will deliver graphics that until now could be produced only on supercomputers. Even more amazing is the fact that when it hits the market in late 2000, it will be priced below \$500.

It's a great example of a coming generation of processors designed for application-specific devices, rather than PCs, and was developed by Sony and Toshiba in a joint venture. At its heart is a microprocessor, dubbed the 'Emotion Engine', designed to draw tens of millions of polygons per second, giving low-cost games system graphics the quality and realism of, say, the movie *Toy Story*.

To attract and recruit games developers, Sony showed the system a year ahead of its launch. And Sony hopes that developers will go beyond shoot-em-up games to create works with the same impact as a great book or movie. It says the new chip has enough power to convey human-like motions and abilities in the game characters. It could also deliver games which include artificial intelligence and speech recognition, technology that alone would raise this system beyond its rivals. Imagine the possibilities of giving the system high-speed web access: game developers and even movie studios could deliver interactive games and movies.

Analysts suggest it could herald a merger of the film, TV and video-game sectors. Some said that this was the first real alternative to the PC, for reaching people on the internet. Indeed, it has the power to become just about anything it wants. The system is proprietary but adheres to key standards like CD-ROMs, DVD, USB and Firewire. It will even have standard slots for modems, network cards, hard drives and flash memory. Clearly, Sony has more in mind than just a standalone games system, though no one from the company would say what.

Designers who write for both the original Playstation and the Nintendo 64 were blown away by what they saw and couldn't wait to get the developer kits and begin working on their own



Playstation II visions. A couple of mainstream developers were excited about the potential of writing programs to steer the Playstation II towards net-driven information systems. They wanted Sony to develop strong communications capabilities in the system.

Sony sources suggest that when the system launches, communication will be built in and developers will produce multi-user games from the start. One can imagine that Playstation II, with net connections and add-on capabilities, could become the front-end to digital TV. Most digital TVs are not being designed with PC functionality; the computing power will reside in a set-top box or web TV-like system. But with a big hard drive for recording and playback, the Playstation could double as a digital VCR. Add the web connection and you have a versatile device which turns your TV into a digital entertainment system.

The Sony Playstation II then becomes the Trojan Horse which many people

believed Microsoft had with its web television. Although the web television is going in this direction and Windows CE is the OS in the new Sega game system, the quality and versatility of the Playstation II could cause Microsoft and Sega's efforts to be slowly adopted come late 2000.

While low-cost PCs still dominate in the home, it's clear that Sony is ready to challenge the conventional wisdom of what a home computer should look like and what it can do. It is poised to take aim at this consumer market as it reaches out to more home owners looking for a device that does more than simply access the web on their TV.

▲ **DEMONSTRATION**
PLAYSTATION II
ANIMATIONS USING A
CHARACTER FROM
NAMCO'S **RIDGE RACER 4**

GAMES NEWS

Space, stars and destruction in detail



▲ MICROSOFT BREAKS NEW GRAPHICS GROUND WITH ITS SPACE COMBAT GAME, STARLANCER ►

Microsoft games are entering the market thick and fast this year. We have details of a new first-person space combat called **Starlancer** due for release at the end of 1999. This game will provide a level of graphic detail not currently found in space combat games, with particle effects, dramatic source lighting and realistic ship destruction.

Countries from around the world including the United States, China, Russia and Great Britain have formed strategic alliances and now battle for control of Earth, Mars and other planets across the solar system. As part of a newly formed, ragtag aviation unit, the 45th Volunteers Squadron, players must prove themselves and earn the respect of their peers. Look out for a review in *Screenplay*.

► If you have a Mensa IQ and a year to spare, then **Aureum**, the new Attica release, could be right up your street. The setting for this CD-ROM is the Roman Empire. For over 1,000 years, following a barbarian attack, a hoard of gold coins has been hidden in a ruined building. In the process, some have been lost. The player's task

is to find the lost coins by using the clues on the CD-ROM; clues that use beautiful imagery reminiscent of the era, based on factual events and related issues of the period. Each puzzle takes, on average, three weeks to complete. They are mainly visual and use no present-day language. Ten people who succeed in the task will take part in an all expenses paid holiday to the Mediterranean and one will win £20,000! Aureum is out now priced £39.99. More information at www.aureum.net.

► Grand Theft Auto, the most dangerous game of the nineties, is back. The sequel, **Grand Theft Auto: London**, is set in 1969, just as the glamour of the swinging sixties meets the danger of the psychotic seventies. The hippies, freaks and potheads are on their way out, and a new breed of sharp-dressed, gun-wielding gentlemen are making their mark on the city. Gameplay is similar to the original but includes Mini's and pigeons, and among the crazy

Top 10 products Last month

CD-ROMs

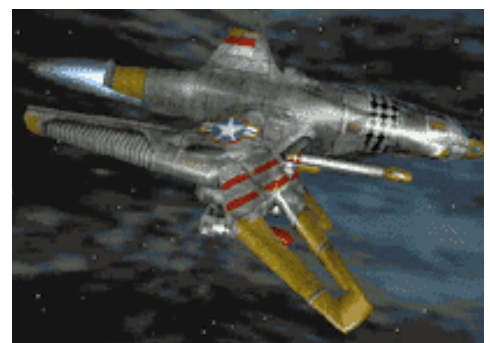
1	Simpsons: Virtual Springfield	Fox Int.	-
2	Simpsons: Cartoon Studio	Fox Int.	1
3	Dancing Baby Screensaver	Guildhall	3
4	South Park Screensaver&Utils.	Telstar	2
5	Star Wars: Behind The Magic	Activision	4
6	Dance eJay II	Fast Trak	7
7	Dancing Baby CD Player	Guildhall	6
8	Rave eJay	Fast Trak	7
9	Encyclopedia Britannica	Acclaim	-
10	Top OfThe Pops: Mix Factory	BBC	-

Games

1	Championship Manager 3	Eidos	-
2	X-Wing Alliance	Lucas Arts	-
3	Grand Theft Auto: London	Take 2	8
4	Jimmy White's Cueball	Virgin Int.	-
5	Call To Power: Civilization	Activision	-
6	Commandos: Beyond The Call...	Eidos	-
7	Heroes Of Might and Magic 3	Ubisoft	-
8	Populous: Undiscovered Worlds	Bullfrog	-
9	Lands Of Lore 3	EA	-
10	Silver	Infogrames	-

Games and CD-ROM figures supplied by HMV. Peripherals, Windows software and DOS software charts will reappear next month.

missions you can blackmail a bent MP and steal the crown jewels. Watch out for a review in *Screenplay*.



► Some of you may remember the review of The Rocky Interactive Horror Show, published in December 1998's *Screenplay*. Well, finally, the new graphic comedy adventure starring Brad and Janet has hit the shelves. The CD-ROM containing new and original songs from **The Rocky Horror Show** is priced at £29.99.

ETELKA CLARK

In *Screenplay* this month: *Resident Evil 2*, *Pool Shark*, *South Park*, *Live Wire*, *Alpha Centauri* and *Biosys*.

Michael Hewitt takes in a film and can't quite suspend his **level of disbelief** enough.

Saving Meg Ryan



Sunday, 14 February, and it was off to the UCI for the Sutton première of 'You've Got Mail'. The throng of fans, hoping, no doubt, for a glimpse of stars Meg Ryan and Tom Hanks, were, unfortunately, to be disappointed. Last minute

professional commitments meant that neither could make it. However, this didn't stop the area's glitterati turning out *en masse*. The cinema's foyer was a riot of colourful elegance, courtesy of top couturiers, BHS, C&A, and some guy down the market. The media was in a near uncontrollable feeding-frenzy. 'No pictures! No pictures!' roared my burly minders, shielding me from the barrage of popping flash-guns while simultaneously manoeuvring me through the scrum of *paparazzi* and on towards the popcorn kiosk.

After all this excitement, the film itself turned out (predictably, given all the hype) to be something of a disappointment. As you're no doubt aware, it's the tale of a man and a woman — Hanks and Ryan — who, though they would quite cheerfully feed one another rat poison in real life, are nevertheless conducting a sizzling email relationship online, with neither aware of the other's true identity.

Fine up to a point. However, certain aspects of the story require, not so much a suspension of disbelief, but rather that it should be allowed to levitate of its own accord. First off is the fact that neither character knows anything about the offline persona of the other, nor seems to have any interest whatsoever in wanting to know. Which, given that they're supposed to have become soul-mates online, is strange indeed. Aren't they curious as to what the other looks like, at the very least?

In the real online world, if that's not a contradiction in terms, it's become etiquette, these days, to swap pictures from the outset just to prove that neither of you is any sort of human emetic. But Ryan and Hanks are, instead, happy to stick with the *noms de voyage*, 'shopgirl' and 'ny152', and insist on a policy of 'non-specifics' throughout. The trouble with non-specifics, though, is, as one unfortunate lady found out recently, that you're online *beaux* could, in fact, be a serial murderer on Death Row. Or worse, perhaps, Meg Ryan.

A fairly trivial matter, this Meg Ryan thing, I know.

It's all down to taste and individual preference, of course. But personally, I'd try to claim damages from the ISP if I discovered I'd been unknowingly bonding with her online. Her character is so unbelievably cutesy and sugary-sweet, that the film ought to carry a health warning up front for diabetics. Then again, each to his/her own. It's quite possible that she doesn't fancy me, either.

Most unbelievable of all, though, is the mail system as depicted in the film. Whenever Hanks and Ryan log on and get the 'You've got mail!' voice, we're shown the contents of their individual mail boxes. All they contain, if they contain anything at all, are their emails to each other. Where are the 'XXXX hot teenage sluts!!!!', 'Make \$100,000 a year, tax free!', and 'Congratulations! You've won a Caribbean cruise!' junk emails that all the rest of us get?

The point is, Hanks and Ryan are supposed to have met online in a chat room. But, as anyone who's ever used a chat room, particularly a busy American one, will be aware, within about 30 seconds of entering, you start to feel as if you're on the Somme, circa 1916. Except it isn't artillery that's bombarding you, but a relentless barrage of automatically generated junk emails. These are courtesy of programs operating in the background, whose

Where are the 'XXXX hot teenage sluts!!!!', 'MAKE \$100,000 A YEAR, TAX FREE!', and 'Congratulations! You've won a Caribbean cruise!' junk emails that all the rest of us get?

function in life is to harvest the email addresses of chat room participants and add them to mailing list databases.

Curiously, the chat room context doesn't seem to make any difference to their targeting. You can, for instance, be in a room called 'Catholic', chatting away to a group of Papal nuncios about the joys of celibacy, but you'll still get dozens of emails exhorting you to come along and join in some wife-swapping action.

OK, all rather a lot of nit-picking, I agree. But what are nits for, if not to be picked? As a film with an internet theme, 'You've Got Mail' isn't a total 'Johnny Mnemonic'-style disaster, but it won't make my Top Ten for 1999, either. If you haven't already seen it, don't waste £5 watching it in the cinema. Wait for it to come out on video.

Mike.hewitt@mjh1.demon.co.uk

Barry Fox finds his analogue **modem under threat** from digital phone lines in hotels.

Frying tonight



Well, that didn't take long. PowerQuest has already abandoned the copy-protection system which crippled the recently launched Lost and Found disc repair and data recovery utility. I tried three separate shrink-wrapped discs

and each played the same horrid trick: the software refused to load, and an error message claimed the disc was an 'unauthorised copy' and put the floppy drive out of action until the PC was re-booted.

I spent a long time on the phone to the USA, while they talked me through a test procedure based on new program files sent by email. The result was the same. PowerQuest admitted that other users had encountered similar problems and they had no idea why.

A statement from PowerQuest ('Innovative solutions for changing environments') now admits defeat and apologises for any inconvenience caused. Yes, a lot of inconvenience. Apart from the time spent persuading PowerQuest, I found their product flakey, and I wasted hard cash and a lot of time replacing my floppy drive because PowerQuest had decided it must be faulty. This a shame, because I'd hoped PowerQuest might be offering some much-needed competition for lost-the-plot Norton.

Another product I've been trying is aimed at travellers needing to use laptops in hotel rooms. Even old hands who carry a full range of plugs and crocodile clips, and know how to defeat non-standard dial tones (by adding X3 to the dialling string so that ATDT123... becomes ATX3DT123...) are now facing a more serious obstacle.

Modern hotels often use digital switchboards to route and bill calls. Some send digital code to room phones which have built-in converters. The plugs and sockets are the same, but if a conventional analogue modem is plugged into a digital line, it will not work and the higher current, up to 0.5 A, fries the modem. Analogue phones should be marked 'Complies with Part 68, FCC Rules', but some are wrongly labelled. Passive fuses and trips may not work fast enough to protect a modem.

At Comdex I saw Konnex, of San Diego, which sells a fix. The \$200 AutoSet exploits the fact that all phones, whether digital or analogue, send an analogue signal to the handset. The AutoSet plugs between the main body of the phone

and the handset, relying on the digital-to-analogue converter inside the digital phone to provide a safe working connection for a conventional analogue modem.

This brought back memories of the very early days of mobile computing, when the Tandy 100 and 200 models were leading the industry and Radio Shack in the USA sold a delightfully simple gadget: you just unscrewed the microphone cap on the telephone handset and replaced the mic capsule with a cap and phone jack. You got direct connection to the phone line because of the way phones are wired.

These gadgets disappeared when phone companies began using moulded handsets. But most modern handsets use a removable mini-jack connection to the phone. So I made a lead which connects a modem to a phone body in place of the handset (the two outer wires of the miniature handset plug go to the outside wires on a BT plug, or the inside two wires on a US RJ plug), so providing the necessary electrical link.

So why would I need an AutoSet? Two reasons, say Konnex. Digital phones use a higher gain amplifier for the handset than an analogue phone; if you connect a modem direct to the body of a digital phone, you risk overdriving

This brought back memories of the very EARLY DAYS OF MOBILE COMPUTING, when the Tandy 100 and 200 models were leading the industry

the amplifier, distorting the signal, corrupting data and possibly frying the phone amplifier. Modern laptops use switched mode power supplies, to cope with anything between 100 and 240 volts. Some have poor isolation which lets a 30-40 volt AC voltage build up on the chassis. If this feeds through the modem to the phone you get 50 or 60Hz hum, corrupted data or possibly a fried phone. The Konnex uses smart circuitry which matches the signal level from the modem to the phone, and blocks stray voltages. The downside is the cost (\$200, which probably means £200 in the UK), the instructions are a mishmash, and with some phones, dialling may have to be manual.

I haven't yet plucked up courage to try my home-made simple link on a hotel phone instead of the Konnex, but I guess I will.

100131.201@compuserve.com

Brian Clegg welcomes the steady addition of **new features** to business software.

Feature fever



Until hard disks got so ridiculously big that only dedicated gamers could fill them, a popular moan about business software was featuritus. You know the sort of thing. The software company thinks 'it's time we

raked in some more dosh from the suckers (sorry, excellent customers), so what idiot features can we cram in to justify a new version?' The result, it was implied, was software bulging with features that no-one could possibly want. 'All I need,' claims the feature-hater 'is the basic word processing I get from SuperRite 1.0, which runs in 2K of memory on an abacus.' Obviously software companies do want to rake in cash regularly, and adding new features is a great way of doing it. It's also true that every new version of a piece of software isn't worth buying. But let's expose the featuritus argument for the fallacy it is.

There are two fatal flaws in the argument. The first is the assumption that by version 3, for example, they've got rid of the bugs, added the good features that were missing originally, and every version since is bloat. I have a simple counter to that — AutoRoute 2000. For the few people who haven't heard of it, AutoRoute is the British-originated route planning software gobbled up by Microsoft a few years ago. The last couple of versions haven't been anything to get excited about; if anything, they seemed to prove the featuritus case. Then along comes this new one. I hate to get all excited about a Microsoft product, because I'm bound to get emails suggesting I'm under the mind control of the evil Bill, but the fact is, it's brilliant, and the reason is because of the new features.

Let's just look at a couple. Ever since the early days, AutoRoute has been a great way to get to another town; but once you were there, how did you find Blackadder Road or wherever you were going? You had the option of either lashing out on a street map, or you had to stop and ask a local. Now AutoRoute has street-level mapping for the whole country. Search for Blackadder Road, and there it is in all its glory. Once you've got there, perhaps you need a good pub for lunch — no worries; after years of moaning by me (and maybe one or two others) they've finally included the whole

Good Pub Guide. These are two features that have transformed the product for me.

The 'me' at the end of the last sentence highlights the other problem with featuritus. One person's useless feature is another's lifesaver. What we mean when we say a product has useless features is 'features I don't want'. Because, of course, what I want is what everyone wants... isn't it? The classic example is word count, that handy feature you'll find in practically every word processor. For 99 percent of businesses, this is a waste of code. When you are writing a memo or even a budget plan, you might be interested in how many pages there are, but not how many words. Yet it's there, because one small (but I like to think important) segment of word processor users need it — writers. Whether you are producing an epic novel or a column like this, the publisher is fussy about the number of words in it. For those who remember counting by hand, word count is a lifesaver. It is also vital for students, who need to calculate how close they are to the minimum word requirement before hitting the union bar.

You could use a similar argument for macros in office

One person's useless feature is another's lifesaver. What we mean when we say a **PRODUCT HAS USELESS FEATURES is 'features I don't want'**

products. After all, here's an example of a feature that can be positively malicious — it's the basis for all those document-based viruses that plague us. Yet while many people don't use macros, the businesses that do would never think of macros as unnecessary frippery, and nor would they complain about new versions which bring macros in line with other programming languages, thus enabling sharing of code.

Seen in perspective, the steady addition of new features is a good thing. With CD-ROMs and gigabyte hard disks, space isn't really an issue. If some updates only have trivial features, ignore them, but quite regularly there will be additions that make you understand once more what all the fuss is about. Long live new features!

Brian@cul.co.uk

Paul Smith finds inner peace through **BT's Home Highway**. At least until the phone bill arrives.

I did it Highway



Finally! I've finally had one of my epiphanies. Those of you with far too much memory space to fill may recall last November's column, which ended with me going off to the launch of BT's Home Highway, the new service which converts

your existing analogue line into two analogue and two ISDN versions. I wrote that on 3rd September, and on that day BT promised to kit out a few of us journalists with this fancy new, fast system so that we could test out the Highway in our own homes.

And, you should really have better things on your mind than the recollection of a reference in the following month's article, where I predicted that I would soon be sampling the joys of both ISDN and ADSL, having contrived to marry myself into what, at the time, held itself to be within BT's West London ADSL trial area. It turns out, incidentally, that I was three blocks short — a matter of the greatest frustration. Legal advice also informs me that this is hardly grounds for divorce. So, I resigned myself to ISDN Day which would rank alongside Surround Sound Day and DVD Day as one of the great milestones in my (but, strangely, not our) life, a day of much merriment, joy and cabling. But it didn't come. There were delays and lost bits of paper and the need for approval from little-known bodies of murky standing. ISDN Day receded into an administrative smog.

And then finally, six whole months from launch day, ISDN Day was upon me. At 8:30, ISDN Day Man would turn up, cable for an hour and disappear, leaving me in technobliss. Of course, it didn't quite happen that way. Mr. IDM came, cabled, drilled, fiddled, left, returned and started again — for ten hours. It turns out that living near Olympia Exhibition Halls means that you run the risk of BT engineers secretly pulling out 'spare' cards down at the exchange to satisfy the temporary needs of exhibitors.

At any rate, Mr. IDM spent the whole time here, with an annoying person standing over his shoulder going 'Oh, yeah, and what's that bit for?' (who should have been going 'Well, you're spending so much time here, the least I can do is to ask your name'). Now he's gone, and ISDN is here. And it is a source of so much joy.

Of course, I had to kit myself out with tons of new stuff — which is A Good Thing in itself — mostly Netgear stuff from Bay Networks. It comes in nice boxes and adds to the general tone of celebration.

I started off with a terminal adapter, the ISDN equivalent of a modem. But, having more than one computer, I decided to delve further and learnt much about the arcane world of networking. I am now one of the Chosen Few who knows what a hub, a switch and a router do. Better still, I've installed all on my network of two PCs to save me from having to reach around to connect to the net.

An ISDN router, like the Netgear RT328 I've got here, is simply the coolest piece of kit since the 3Com Palm V. (I know it wasn't that long ago, but you know what I mean.) It lets all my computers connect to the net over ISDN using such coolnesses as bandwidth-on-demand, an everyday miracle which will start the second ISDN line if bandwidth remains over, say, 45K for five seconds, and drop it if it falls below, say, 30K for five seconds.

Here's why we all love ISDN: I love it because it's fast and connects in less than a second; Del loves it because

Edward loves ISDN because, frankly, HOW'S A CAT SUPPOSED TO GET ANY SLEEP with that noisy modem handshaking business going off in his ear every few minutes?

she can surf all the estate agent sites a lot quicker and because she hasn't yet seen the phone bill; Edward loves it because, frankly, how's a cat supposed to get any sleep with that noisy modem handshaking business going off in his ear every few minutes?

This telephone bill business is going to be a key factor, so I have decided to adopt a blind spot and learn never to think about it, otherwise it will become too depressing. What with that fast connection and British Telecom's indefensible — I know, I've asked them — five pence minimum call charge, you could easily rack up 50p a minute. Oh well, better get in some of those chocolates that Del likes before the bill arrives.

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You won't regret it.

NET PROPHET

Brian Clegg's *Business Matters* column [*PCW May*] struck a chord with me, having spent the past few months speaking to CompuServe and US Robotics/3Com technical support. To cut a (very) long story short, I discovered that my second BT line was incompatible with V.90/x2 standards. I made a few attempts to find out about the condition of the line, but BT couldn't tell me anything. Several months passed, and then I read Brian's column about his problems with DACS boxes. I phoned BT that weekend and was told that I had a DACS box on the line which could be removed — for free. The box was taken off last Thursday, without BT needing access to my house, and I am now surfing at a 'fast' 48,000. Not quite 56K, but close enough!

JAMES SRINIVASAN

James.Srinivasan@yahoo.com

LETTER OF THE MONTH

Net hopes scotched

Why does Scotland not have a top-level domain name? It wasn't assigned one when all the other countries were, although neither was Ireland (ROI) which now owns the top level of '.ie'. Ideally, we (the SDNS team) would like .sco or similar as a top-level domain, but we understand that it is unlikely to be formed. We emailed Nominet requesting whether 'scot.uk' or 'sco.uk' could be sold, or given to u (we cannot simply register it, as they only register names at the third level) but Nominet responded with: 'We would consider it but at this time we do not think there would be sufficient demand for such a service and that it would not be commercially viable'. Well, I am trying to prove them wrong. Please send a quick email to draal@plexity.net to support this. If there is sufficient response I will send the list to Nominet UK.

ROSS MCKILLOP

babylon5@bigwig.net

Dr Willie Black, md of Nominet UK, replies > *Nominet UK is the national registry for*

all internet domain names ending with '.uk'. It was established in 1996 to manage the .uk top level domain and is recognised by internet users and the internet industry in the UK, and the UK government.

The creation of a country code top level domain (ccTLD) for Wales or Scotland is not within the remit of Nominet UK. The delegation of all ccTLDs is the responsibility of the Internet Assigned Numbers Authority (IANA) whose work is currently being transferred to a new not-for-profit organisation called ICANN, based in the USA. Historically, its practice has been to allocate ccTLDs to those countries listed under the international standard ISO 3166 — that is, those recognised as independent by the UN.

It would, however, be possible for Nominet to create a second level domain such as 'scot.uk' or 'sco.uk' if there were sufficient demand. Such a request would have to be approved by the membership of Nominet UK. This currently comprises some 1,000 organisations and individuals, including all the major national and Scottish ISPs. The details of any such proposal would first be debated by Nominet's policy advisory board and we will pass on to them any comments received from PCW readers or by Ross McKillop and his colleagues.

Nominet@nominet.org.uk

TYPECAST

I have been following the correspondence [*Letters passim*] about IT in schools. As a parent and school governor, I have long complained about one glaring omission: we teach our children to form letters and write correctly, so why on earth do we not also equip them with the skills to use a keyboard properly? We are well on the way to producing yet another generation of two-finger typists!

KHORSHED DINSHAW

kdinshaw@compuserve.com

PORN AGAIN

Adrian Burgess hit the nail on the head when he wrote [*Letters, May*] that Michael Hewitt knows little about the internet. Michael's reply stated that he was 'too busy downloading pornographic gifs' to reply. Any fool knows that porn pictures are JPEGs... er, or so I've been told.

ANDY DAVIS

alchemist@clara.net





TUTTI FRUTTI

Simon Pendrey [*Letters, May*] remembers 'other' computers which had been named after fruit at the dawn of personal computing, which brought to mind Commodore's excellent advertisement of that era. Under a large picture of an onion it read: 'Just because it isn't called after a fruit...'

TOM BELL-RICHARDS
LITTLE BARRINGTON, GLOS

CELINE DREAM

For a long time now I have used a shareware copy of Audio Grabber, a software program designed to rip data from audio CDs. I use it mainly to amuse myself, copying songs from Celine Dion CDs and then speeding them up. Other than that, I really couldn't see the point, since standard wav files are far too large to be able to have any quantity of them on your hard disk. Not only this, but the only facility I had for running more than one of them simultaneously often distorted the files when playing. I did notice a little button, though, which read 'MP3', so out of interest I pressed it: 66 files and 116Mb later, I have managed to create a large library of all my favourite tracks. I know many people have said MP3 just doesn't stack up to CD quality, but I can't tell the difference, except of course that the files are between 20 and 30 times smaller. I would seriously recommend anyone to create some MP3s on their hard disk, as it is so much easier than having to constantly change the CD and it really doesn't take up that much space.



JAMES STORMONT
James@dstormont.freemove.co.uk

PCW replies > *It seems that more people are currently using MP3 for hard-disk music libraries than downloading tracks onto solid-state personal players like the Diamond Rio. PCW's own Ian Robson is a great fan of this process, and boasts several hours' worth of popular beat combo hits to play off his ample hard disk.*

INTEL US THE TRUTH

Intel's PIII processor may well be very fast, but does the company really believe that it will 'bring the internet to life'? A very fast processor cannot increase the speed of the internet if the transfer rate is abysmal — as it usually is at peak times. Even when the internet is running quickly, a fast processor rarely makes a difference. The computers we use at college are only P100s with 32Mb of RAM, running NT4, but because they have an ISDN line the internet usually runs faster than on my AMD K6-2 400 with 64Mb of RAM. Maybe Intel and various other firms which use their processors should be realistic about how a fast processor will affect the speed of the internet. Until then, inexperienced buyers will waste their money buying the latest processors based on the incorrect assumption that it will speed up the internet.

PATRICK GOVIER
Patrick@Govier6.freemove.co.uk

Gordon Laing replies > *Intel's claim that the Pentium III brings the internet to life refers to the quicker decompression of complex online audio and video files, particularly if using KNI optimised code. From personal experience, the only real way to bring the internet to life is to have a fast connection and use it when everybody else has gone home. I usually find, working for a large company with T1 leased lines, that accessing the web out of office hours normally does the trick.*

WHAT'S THE SCORE?

PCW uses SYSmark98 and other benchmark software to measure the speed of different PCs. I would like to know the SYSmark score for my own machine. From where can the SYSmark software be downloaded?

MATT GARRETT
mattg@magik.demon.co.uk

Gordon Thorn, VNU UK Labs manager, replies >

SYSmark98 is a real-world test. It comprises 14 applications covering areas from 'office' to 'productivity'. As the software packages are all commercially available, they are covered by copyright and so SYSmark98 is not available for free download. Although we appreciate that readers may wish to have tests which are freely available, VNU Labs needs to use the highest quality tests available which produce results with a true meaning. If you really want to know how your machine compares, you can purchase SYSmark98 for \$199. Purchasing details can be found on the BAPCo web site at www.bapco.com. The complete suite of BAPCo tests will cost you around \$1,000. □

Cardsharp ▾

The same size as a credit card, and only a hair's breadth over a centimetre around the waist, this is the world's largest storage capacity in PC Card format. This Type III PC Card contains a 1Gb hard drive, giving it the ability to add around 50 percent to the storage potential of the average notebook computer. Even better is the fact that by simply slotting it into an existing slot, it incurs no installation or configuration procedures. For a round-up of other hard drives and storage solutions, turn to our storage

Group Test on p166.
Price £515.83 (£439 ex VAT)
Contact Calluna 01592 630810
www.callunacard.com



Mighty Mouse Nightie ▾

Give your mouse a good night's sleep with the Mouse Nightshirt. Retailing through Athena, this cute little vest will keep the dust out of your plastic pal's innards, although as it covers the ball, you will have to remember to remove it again before running the rodent across your desk.

Price £3.99
Contact The Really Good Card Company 01865 246888
rgcc@reallygood.demon.co.uk



ZoomAir Wireless Network ▾

If you read last month's *Head to Head* review on wireless networking versus wired networking and you're itching to get your hands on some wireless kit, then the ZoomAir Wireless Network may be worth a look. Drop a ZoomAir ISA NIC (Network Interface Card) into an ISA slot on your desktop, or slip the PC Card (pictured, right) into your notebook, and with the compatible software you'll be enjoying peer-to-peer and Ethernet network access at up to 2Mbps in a matter of minutes. What's better is that it will work across a range of 300ft indoors and a massive 1,000ft outside.

Price £200
Contact Zoom Telephonics 01245 352403
www.zoomtel.com



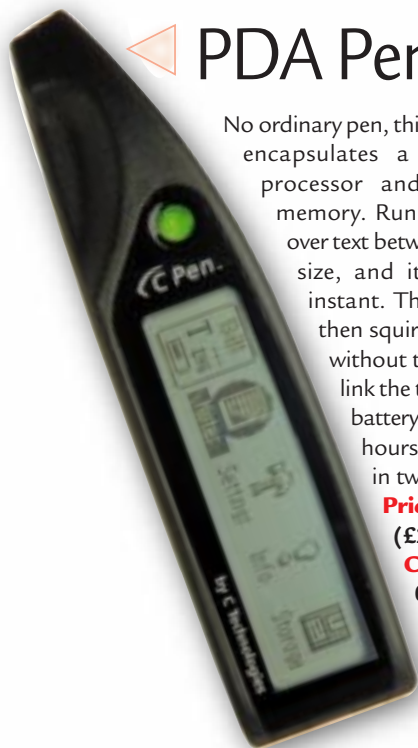
HP Jornada 680 ▾

Hot on the heels of the 820E and 480, Hewlett-Packard is introducing yet another Jornada to its rapidly expanding range. Built around a 133MHz 32-bit Hitachi processor, it comes with an internal 56K modem, has 16Mb SDRAM, 16Mb of user-upgradeable burst mode ROM and, with the optional TV-out PC Card, can display its wares on a 1024 x 768 display in 256 colours. At 76 percent regular size, the keyboard is far from pokey, and for productivity on the move the 680 includes the full complement of regular Windows CE applications.

Price £699 (£594.89 ex VAT)
Contact Hewlett-Packard 0990 474747 www.hp.com/jornada



◀ PDA Pen



No ordinary pen, this handy gadget encapsulates a 100MHz Intel processor and 8Mb of flash memory. Run its digital camera over text between 7pt and 18pt in size, and it's captured in an instant. The IR link in the top then squirts it back to your PC without the need to physically link the two. The rechargeable battery is topped up in just 12 hours and shouldn't run dry in two weeks of normal use.

Price £292.58
(£249 ex VAT)
Contact MegaPixels
01425 674617
www.megapixels.co.uk

Casio E-100 ▼

When we saw this little beauty, we could hardly believe our eyes. Billed as 'the world's smallest pocket multimedia player', it features a large 65,536-colour backlit display and a 131MHz processor. With 16Mb RAM and 16Mb ROM, it has the same capacity as some desktop PCs. What makes this PDA stand out from the crowd is its multimedia capabilities, enabling it to handle MP3, MPEG and stereo audio with remarkable clarity. Watch out for more PDAs in our *Group Test* next month.

Price To be confirmed (around £500 inc VAT)
Contact Casio 0181 450 9131
www.casio.com/hpc/e-100.cfm



▲ Web Racer

It's called a mouse, but it looks more like a touchpad. The Web Racer claims to give you instant access to any web page. It does this not by boosting the speed of your connection, but by allowing you to program six addresses into the instant access buttons along the top. The touchpad area includes scrolling zones for moving the page around, while other buttons give access to bookmarks, printing and mail functionality.

Price £49.99 (£42.54 ex VAT)
Contact Kensington 0800 252359
www.kensington.com

▼ Sharp's VN-EZ1 Internet ViewCam

It may look like a digital camera, but Sharp's VN-EZ1 Internet ViewCam can store up to one hour of moving video onto 32Mb SmartMedia cards by employing MPEG-4 compression. Capturing movies at up to 320 x 240 or still images at 640 x 480, the

ViewCam is perfect for filming events, and then emailing or posting them on web sites. MPEG-4 videos are compatible with Microsoft's Advanced Streaming Format, ASF, supplied with IES and Win98, which, like RealVideo, can start playing a file without first entirely downloading it.

The ViewCam measures a pocket-sized 78 x 88 x 42mm, and weighs 240g with four AA batteries.
Price To be confirmed (under £600, summer release)
Contact Sharp 0800 262958 www.sharp-world.com



reviews

This month sees the launch of the world's first **TWO-MEGAPIXEL DIGITAL CAMERA**, arriving in the PCW offices direct from Japan. It promises bigger photo-resolution printed results than ever before and poses a real challenge to traditional film cameras. Corel puts in an appearance this month, with a beta version of **DRAW 9**, the latest development in its successful graphics package. We also feature one of the UK's **FIRST REVIEWS** of the 3D graphics software, **BRYCE 4**.



A host of notebooks accompany three ground-breaking PCs: we take a look at the **PANRIX PENTIUM III XEON** workstation, contrasting with an upright flat-panel-and-computer-in-one from **AJP**, and a **£299 BARGAIN** that's just right for the home hobbyist. Web developers will be eager to see **HEADLINE STUDIO 2**, the simple way to generate online animated banners. And, if you're trying to decide whether you should opt for a fax machine or some snazzy software to do the same job from your PC, then be sure to check out this month's **HEAD TO HEAD** where we consider just that dilemma.

NIK RAWLINSON, REVIEWS EDITOR
NIK_RAWLINSON@VNU.CO.UK

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VNU European Labs



VNU Labs tests all kinds of hardware and software, from PCs to modems to databases. All our tests simulate real-world use and for the most part are based around industry-standard applications such as Word, Excel, PageMaker and Paradox. Our current PC tests for both Windows 95 and NT are the SYSmark tests from BAPCo. In all our performance graphs, larger bars mean better scores.

Ratings

- ★★★★★ Highly recommended
- ★★★★ Great buy
- ★★★ Good buy
- ★★ Shop around
- ★ Not recommended

Panrix PowerStation 500

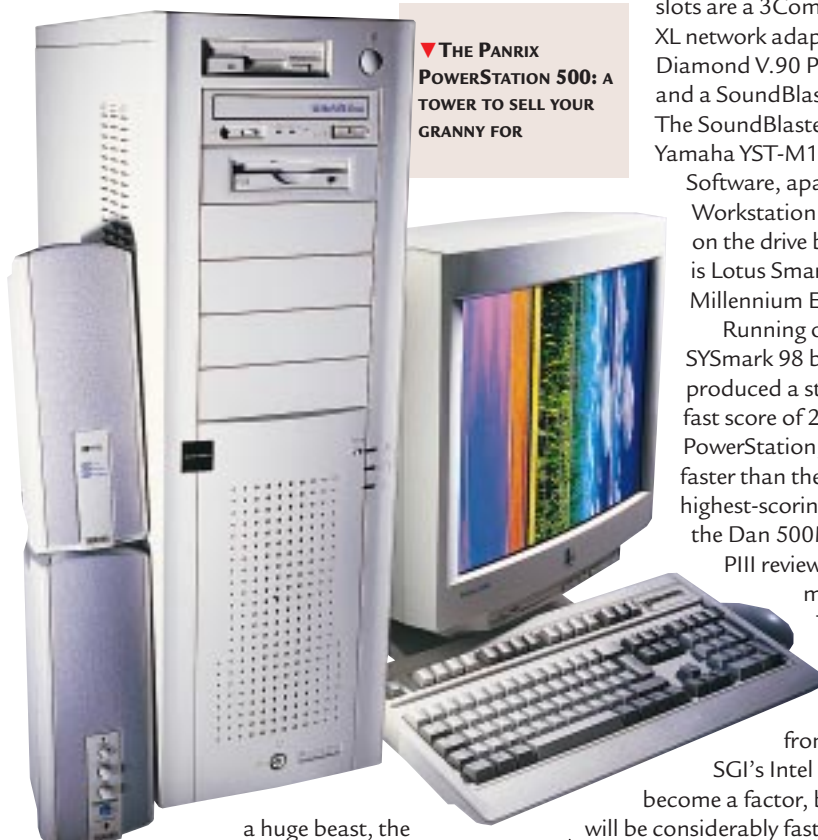
A colossus of a system marketed as a server CPU and power workstation.

The launch of the Pentium III Xeon was inevitable. But the immediate question that sprang to mind when we heard of the launch was whether it would be much benefit. After all, the Xeon is intended as a server processor, and SSE (streaming SIMD instructions — the instruction set formerly known as KNI) does nothing for performance in that area. But Intel is now pushing the Xeon as a power workstation as well as a server CPU, and the PowerStation is an NT4 box aimed at this market.

If a system's quality was directly proportional to its size, we wouldn't have needed to switch the PowerStation on to give it the thumbs-up. The case is a huge full-tower affair with six 5.25in front panel drive bays, two of which are occupied by a Zip 100 and a Plextor 40-speed CD-ROM drive. Given its size, 3.5in drive bays are a little thin on the ground, with only two spaces free, but there are mounting points for extra drive cages.

The heart of the system is the SuperMicro S2DGU motherboard, a dual-processor-capable board sporting the 440GX AGP chipset with integrated Adaptec Ultra2 SCSI. Ultra2 uses an LVD (low voltage differential) interface, bolstering signal integrity to allow a maximum sustained data transfer rate of 80Mb/sec. Making the most of the interface is an 18Gb IBM UltraStar 18ZX hard disk, operating at 10,000rpm and replete with a 4Mb data buffer. This is a fast drive that also gets fairly warm, but Panrix has gone to town with cooling: the drive, mounted in a bay at the top rear of the case, is serviced by a row of three miniature fans. Cooling in general is not going to be a problem — there are a total of eight fans in the system.

Dominating the interior of the PowerStation is, of course, the PIII Xeon,



▼ **THE PANRIX POWERSTATION 500: A TOWER TO SELL YOUR GRANNY FOR**

a huge beast, the height of which can only just be accommodated while still being able to get the side of the case back on. The Xeon fitted is the 'entry level' 500MHz version with 512Kb cache running at core speed. PIII Xeons are also available with 1Mb and 2Mb cache, but these cost silly money and aren't viable for a workstation. Clock speeds are forever rising, of course, and by the time you read this, the 550MHz variant will be available. A single 256Mb SDRAM DIMM nestling in one of the board's four sockets completes the core components.

The PowerStation's graphics are catered for by an ATI Xpert 128 with 16Mb SDRAM. The Rage 128 chipset is currently the fastest viable 2D/3D chipset for a serious machine, since 3Dfx still hasn't managed to get a full OpenGL ICD out the door. The Xpert 128 drives a Formac ProNitron 19/500 19in monitor, which is a rebadged Sony Trinitron unit. This gives excellent picture quality, but there was some ghosting at resolutions over 1024 x 768.

Occupying the PowerStation's PCI

slots are a 3Com Fast Etherlink XL network adaptor, a Diamond V.90 PCI modem and a SoundBlaster PCI 128. The SoundBlaster drives two Yamaha YST-M15 speakers.

Software, apart from NT4 Workstation SP3 (with SP4 on the drive but not installed) is Lotus SmartSuite Millennium Edition.

Running our usual SYSmark 98 benchmarks produced a stunningly fast score of 227 for the PowerStation, 13 percent faster than the previous highest-scoring machine, the Dan 500MHz standard PIII reviewed in last month's PCW.

The price of the PowerStation is one where competition from the likes of SGI's Intel boxes starts to become a factor, but this machine will be considerably faster than an SGI 320 (reviewed in the April issue) for computationally intensive applications, and more expandable to boot. As it is, the PowerStation is supremely fast and doesn't contain a single duff component. It doesn't have the looks of an SGI, but it's got it where it counts.

DAVID FEARON

PCW DETAILS

★★★★★

Price £3,935 (£3,349 ex VAT)

Contact Panrix 01132 444958

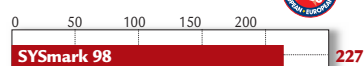
www.panrix.com

Good Points Extremely fast. Superb components. Excellent case.

Bad Points The PIII Xeon isn't the most cost-effective CPU.

Conclusion The PowerStation is stuffed with top-notch components, and performance speaks for itself. A workstation to sell your granny for.

PERFORMANCE RESULTS



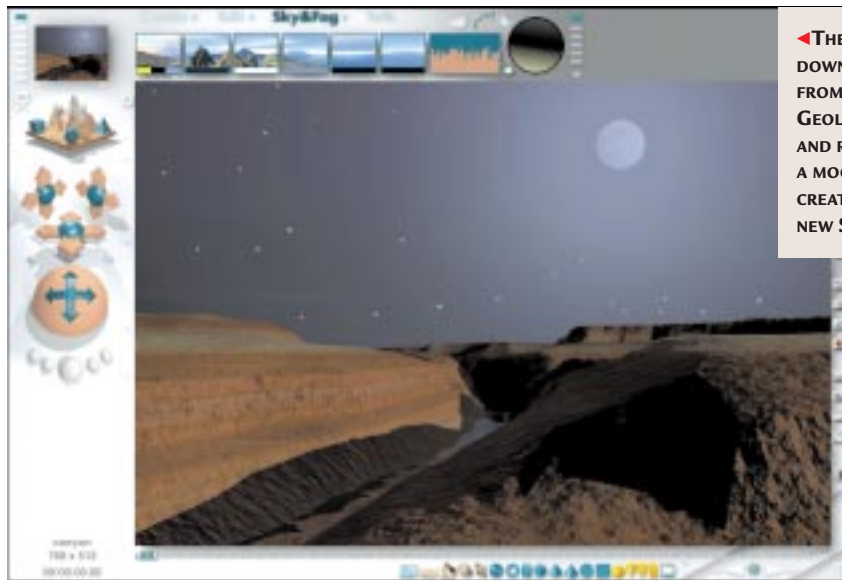
BAPCo SYSmark Windows 98 test scores

EXCLUSIVE

Metacreation's Bryce 4

3D graphics

The new Bryce boasts some **innovative advances**.



◀ **THE GRAND CANYON, DOWNLOADED DIRECT FROM THE US GEOLOGICAL SURVEY, AND RENDERED UNDER A MOONLIT SKY CREATED USING THE NEW SKYLAB**

system with 64Mb of RAM. A more significant enhancement is the new 'fractal noise' generator available in the Deep Terrain Editor (DTE). The DTE is a very powerful but complex tool and only devoted,

indeed obsessive, Bryce users will ever master it. However, you can take advantage of the enhanced fractal generator via the new library of 20 preset terrain models that comes with Bryce. Indeed, Metacreation's is as generous as ever in its supply of sample files and libraries. There is also extensive creative as well as technical support on the company's web site through a facility called BryceTalk.

With each new version of Bryce it becomes less distinguishable from other professional 3D graphics packages. However, even following a fourth upgrade it still retains a great deal of its distinctive (not to say peculiar) character.

The most significant technical enhancements are a Sky Lab for generating more sophisticated skies, a RaySpray, which allows you to render parts of a model using a spray-gun-type tool, a clever previewing system for checking animations before they are properly rendered, a more sophisticated fractal generator for creating a host of new and richer landscape geometries, and, perhaps to many users of earlier versions the most welcome addition, powerful support for importing and exporting files.

Looking at the last of these enhancements first, Bryce 4 now truly covers the field when it comes to offering ways of integrating with other software, and ways of publishing the content it generates. All the major 3D file formats are now supported: Lightwave, 3D Studio (the old 3DS format, but not the new MAX one), Truespace, VRML (version 1), AutoCad DXF and Wavefront. There is also exceptionally good support for internet publishing, including facilities for

outputting scenes in Metacreation's own 3D streaming format, Metastream, and animations in RealMovie format for playback using the RealPlayer.

There is also an import filter for US Geological Survey data files (Digital Elevation Maps, or DEM files). These are available for free from the USGS's web and ftp sites. The scene depicted here is based on a DEM for the Grand Canyon, which I downloaded from the USGS ftp server. (Sadly, the UK equivalent, Ordnance Survey, appears not to offer a similar service, at least not for free.)

The other new feature used to generate the image shown here was the Sky Lab. This allows you to do all sorts of things, such as add a star and even a comet field. You can position the sun or moon so it appears in the scene, give it a halo, and in the case of the moon decide its phase (whether new, half or full) and whether to make the surface visible.

The 'Rayspray' tool is fun but, it has to be said, a bit of a gimmick. You need a very powerful system in order to get much out of it; indeed, as with any 3D graphics package, you will find that all of Bryce's facilities make enormous demands on your hardware: the scene shown here took almost half an hour to render on a 300MHz Pentium II

Bryce is a big package, and some parts of it, such as Undo and Help, have failed to develop as fast as others. The texture editor is still too complex and there are inconsistencies creeping into what was a very elegant interface. But at the price (under £180), it remains an unbeatable 3D tool, offering something to the professional and amateur alike.

BENJAMIN WOOLLEY

PCW DETAILS

★★★★★

Price £179 (£152.34 ex VAT)

Contact Computers Unlimited
0181 358 5857

www.metacreation.com/products/bryce4

Good Points Powerful, inexpensive, fun.

Bad Points Vastly improved interface. Excellent new features.

Bad Points Some facilities are now too primitive for a package this sophisticated.

Conclusion A great way to get into 3D.

System Specification Windows Pentium-class CPU, Windows 95/98/NT4 with Service Pack 3, 32Mb free RAM (64Mb recommended), 75Mb hard-disk space, CD-ROM, 16-bit graphics card.

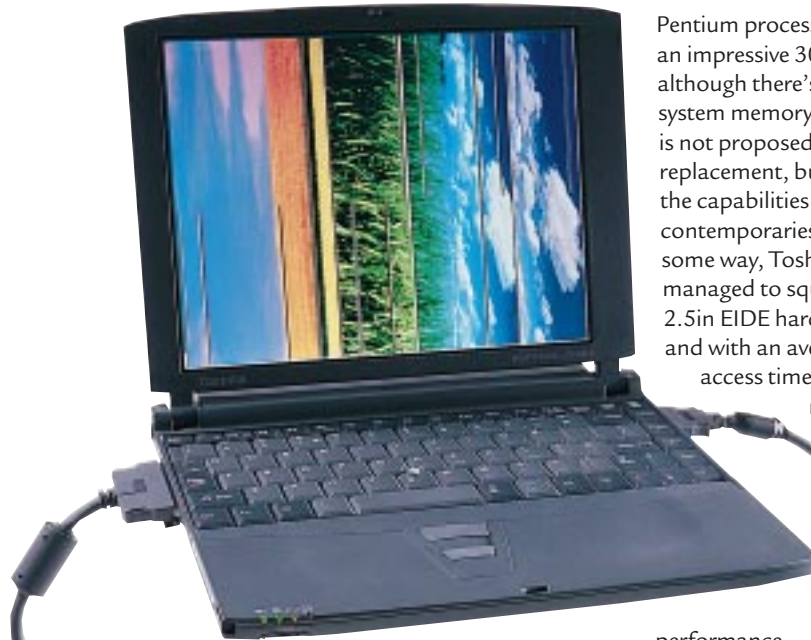
Power Mac Mac OS 7.1 or later, 32Mb free RAM (64Mb recommended), 75Mb hard-disk space, CD-ROM, 16-bit graphics card.



PREVIEW

Toshiba Portégé 3020CT

Mobile computing moves forward with the feisty Portégé 3020CT.



Pentium processor clocking at an impressive 300MHz, although there's only 32Mb of system memory. To be fair, this is not proposed as a desktop replacement, but it's not far off the capabilities of some of its contemporaries. Somehow, some way, Toshiba has managed to squeeze a 6.05Gb 2.5in EIDE hard disk inside, and with an average 13ms access time you'll observe no apparent

experience. There's even space in the design for resting your wrists. The pointing device has been reduced to a nipple in the middle of the keyboard that proved highly accurate in use. What seems unnecessary, however, is the decision to place the left/right mouse buttons one above the other. You do quickly adapt to this, but there's just no reason to alienate this aspect of your practiced working habit.

Wherever there's a revealing piece of chassis space, the designers have attempted to place the oft-expected minimum notebook devices. Although there are still two PCMCIA slots, their forced positioning to either side of the notebook means no support for the older Type III PC Cards. One USB port, an infra-red port, microphone and headphone connectors with a useful front-mounted volume control complete the internally constructed features. A serial, parallel, PS/2 and external VGA connector feature on the mini I/O port replicator.



As first impressions go, when we took the Portégé 3020CT out of its packaging, we thought we'd received a personal digital assistant (PDA) running Windows CE. How wrong we were. Not only is this feisty little number running the full Windows 98, but it also has a stunning set of vital statistics.

Measuring just 257x216x19.8mm and weighing only 1.32kg with its lithium-ion battery, you could forgive us for our initial error. When you consider that the HP Jornada 820 PDA is just a tad lighter and smaller with a much reduced screen, the cost implications of buying a fully functional notebook have to be overlooked. There are sacrifices for such a compact device, in that any removable-media drives will have to be plugged in externally to either the proprietary floppy drive connector or the supplied mini I/O port replicator. Toshiba also offers an optional PC Card CD-ROM drive to complete the colour coordination, but you're not forced to take this option if you have another external CD-ROM drive.

At the core of the Portégé is a mobile

performance concessions to your data transfer rates. All this power in such a small package must have taunted the designers when it came to considering heat dissipation issues on this prototype model. Although the chassis is constructed mainly of plastic, it does warm up to quite an alarming level.

Graphics are catered for admirably by NeoMagic's mobile MagicGraph 128XD chipset featuring 2Mb of video memory, powerful enough to externally display resolutions up to 1024 x 768 at a stable refresh of 75Hz. The Portégé's own display, although possessing only a native resolution of 800 x 600 with a 10.4in diagonal view, is bright and even across its whole surface. Even more impressive was that for a non-transflective design, its brightly contrasted image made outdoor use a perfectly viable option.

The sleek design has a fresh feel to its exterior, with a buffed silver-coloured metallic coating and discrete brand lettering. A long history of achievements in mobile computing, coupled with the splendour of inspired, quality design, has not been betrayed.

The tight keyboard is responsive and comfortable to use, with a subtle give to your strokes allowing for a flowed typing

As this is an engineering sample, the performance result is just a guide to what can be achieved by this marvellous product. And with memory expansion up to a possible 96Mb, whatever the finely-tuned final version kicks out, you'll still have room for improvement.

IAN ROBSON

PCW DETAILS

★★★★★

Price £1874.12 (£1595 ex VAT)

Contact Toshiba Information Systems
 01932 828828

www.toshiba.co.uk/computers

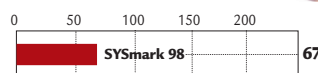
Good Points Huge hard disk.
 Excellent display.

Bad Points All removable media drives external.

Conclusion Toshiba has proved yet again that producing a sub-notebook needn't be at the expense of practical usage.



PERFORMANCE RESULTS



CorelDraw 9

A significant upgrade to draw in **graphics professionals** who only had eyes for Adobe.



test PSD and imported the five-layered file as a group of six objects, each individually editable.

The interactive fill tool now works in the same way as Draw 9's other interactive tools. You can drag a colour

◀ **THE WIDESPREAD INTRODUCTION OF DOCKERS MAKES FOR A LESS CLUTTERED SCREEN. MULTIPLE COLOUR PALETTES CAN BE EXPANDED FOR USE AS YOU NEED THEM**

▼ **DRAW 9 ALLOWS YOU TO IMPORT AND EXPORT ILLUSTRATOR AND PHOTOSHOP FILES WITH LAYERS INTACT. HERE, A FILTER EFFECT HAS BEEN APPLIED TO ONE LAYER OF A PHOTOSHOP BITMAP**



CorelDraw was first released ten years ago, which means that we've had roughly one upgrade a year for the last decade. Corel could never be accused of slacking in the R&D department. The first version of Draw most people remember, 3, was released in 1992. 1995 brought the 32-bit version 6 and 1998 marked the company's inauspicious entry into the Mac market with a PowerPC version of Draw.

CorelDraw 9 is a major step forward.

It includes several big new features which, combined with productivity and performance enhancements, make for a significant upgrade. With this new version, Corel aims to make Draw more attractive to graphics professionals (who are mostly currently using Illustrator or FreeHand) by bringing its feature set up to date, extending file compatibility and improving pre-press output options and electronic publishing features. The PC and MacOS version now share a common interface and, according to Corel, code, though the Mac version won't see the light of day until late summer.

Corel has concentrated a good deal of effort on making Draw a more

attractive proposition to users of its competitors' products and, it seems, has its sights set primarily on Adobe.

True, Adobe products comprise a small fraction of the 70 import and 40 export filters now included. But the ability to import Illustrator documents complete with layers, edit them and re-export them in Illustrator format counts for a lot. It's also promising default workspace configurations, including one that will

look more than familiar to Illustrator users. Corel has some more work to do before this

promise is fulfilled, however. Of a sample selection of five Illustrator documents, the beta failed to open two at all and, while it imported the layers in the remaining three, flattened all the elements onto one of them.

It doesn't stop with vector formats. You can import a Photoshop PSD, layers intact, edit and export, though why you might want to do this is less clear. In any case Draw 9 had no problem with our

from the colour palette directly to the foreground or background handles in the dialogue to change the foreground or background colour of a pattern fill. Drag-and-drop colour functionality has been generally extended. You can, say, drag colours from the colour palette onto layers in the object manager and to guides. Guides can be individually coloured, so you could specify red for cutting guides, blue for folds.

The few remaining roll-ups still in existence have been replaced by dockers. The colour roll-up is now a docker, as are all the colour palettes. There are dockers for just about everything, from the new natural media drawing tools to lens effects and transformation tools. This completely eradicates palette clutter and provides fairly instantaneous access.

To further free up screen space you can replace the title bar on docker windows with a slimmed down 'gripper bar' and select the object manager's

Corel has clearly been keeping a close eye on developments at Adobe

Layer Only View mode which dispenses with all the ancillary information and shows layers only.

Top of the list of productivity enhancements must be the adoption of Microsoft's Visual Basic for Applications (VBA) 6.0. Although CorelScript is still included, VBA's superior features for automation of common tasks and customisation will surely mark the end for CorelScript.

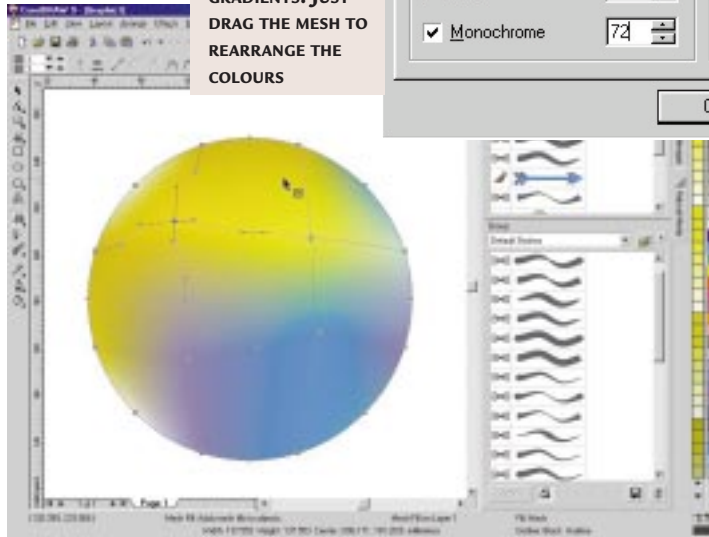
One of Corel's main aims with version 9 is to increase its appeal to professional users and, to this end, a number of features have been introduced. Envoy has finally been abandoned and Adobe's Acrobat portable document format embraced. You can create a PDF directly from Draw 9 without the need to first print a PostScript file to disk and run it through Acrobat Distiller.

Draw 9 offers similar text and font options as well as image compression controls that Distiller users will be familiar with. Also, you can choose to create bookmarks and thumbnails, include hyperlinks created in the object properties dialogue and create job tickets detailing pre-press output requirements. There are also three PDF 'style' default settings for producing PDF optimised for pre-press, web and document distribution.

Draw's already excellent printing facilities have been further improved, primarily by the addition of 'preflight' error checking of the sort now commonplace in page layout software. The document is analysed and potential problems, such as missing fonts, incorrect trapping, incorrectly specified colours and other print-related issues are brought to your attention, saving time and money otherwise wasted on a worthless set of films and colour proofs.

The Prepare For Service Bureau wizard now collects fonts, linked pictures and any other files a service bureau is likely to need to output your file. Other print enhancements include more flexible imposition layout, print multiple documents, downsample bitmap images, rasterise page and an enhanced duplexing wizard. It says something for

► **THE PDF EXPORT DIALOGUE OFFERS ALL THE FONT AND COMPRESSION OPTIONS DISTILLER USERS WILL BE USED TO**
▼ **COREL'S MESH FILL LETS YOU CREATE AIRBRUSH EFFECTS WITH MULTIPOINT GRADIENTS. JUST DRAG THE MESH TO REARRANGE THE COLOURS**



Corel that the company has gone to such lengths to improve on features that the competition doesn't have to begin with. They, of course, would counter that as most vector graphics are destined for a page layout application, that's where you need the output options. It would be a fair point if most layout packages offered this level of output control. They don't.

As for the introduction of groundbreaking creative tools, once again Corel has clearly been keeping a close eye on developments at Adobe. The biggest difference between Draw's new mesh fill tool and the Adobe equivalent which is new to the recently launched Illustrator 8 is that the latter is preceded by the word 'gradient'. In every other respect they are virtually identical. Meshes are basically complex gradient fills. You can define points of colour on a flexible grid or mesh and, by editing the nodes at the grid intersection, control the way in which one colour blends into its neighbour. In this way, it's possible to build up natural-looking airbrush effects.

Convert Outlines To Object allows you to convert an outline path to an object which can then be filled. As well as creating special line fills, this feature can be quite useful for the manual

trapping of complex objects. Draw's natural media tool produces paint-style effects to stroked paths using prests, brushes and calligraphic effects. Brushes closely mimic Illustrator's artistic brushes and allow you to apply any object to a path. You can define a flower as a brush and 'paint' a number of paths all with slightly varied curves and direction to create a bunch

of flowers consisting of a collection of unique blooms. Although the beta collection of brushes was restricted to a wide selection of calligraphic strokes and one arrow, in practice it works well and the brush library will no doubt be extended.

As usual Corel has done everything necessary, and more, to ensure that Draw is a match for the competition. Existing users will be delighted and the first-time-buyer market is now a three-horse race. It remains to be seen if Corel can, as is quite clearly its intention, persuade Illustrator and FreeHand users to defect.

KEN MCMAHON

PCW DETAILS



Price £464.13 (£395 ex VAT); £299 u/g

Contact Corel 0800 581028

www.corel.com

System Specification Windows 95/98/NT4.0, P133, 32Mb RAM, 100Mb hard-disk space, 2X CD-ROM.

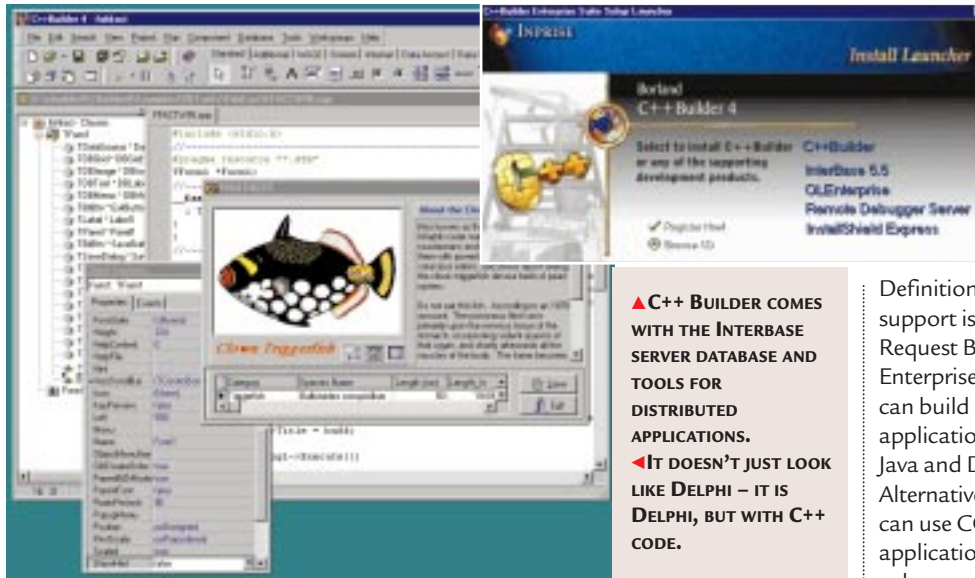
Good Points Vastly improved interface. Excellent new features.

Bad Points Follows where Adobe leads.

Conclusion A big jump up from 8 and well worth the move.

C++ Builder 4

A visual development tool with some **significant enhancements.**



▲ C++ BUILDER COMES WITH THE INTERBASE SERVER DATABASE AND TOOLS FOR DISTRIBUTED APPLICATIONS.
◀ IT DOESN'T JUST LOOK LIKE DELPHI – IT IS DELPHI, BUT WITH C++ CODE.

C++ Builder is a visual development tool from Inprise Corporation, or should that be Borland? If you are not confused, you should be. The company once known as Borland renamed itself Inprise, to reflect a change in focus away from mass-market Windows development tools and towards cross-platform enterprise systems commanding high deployment fees. Last February it remembered that those mass-market tools are its best and most profitable products, and revived the Borland name as a separate group, borland.com. So this is Borland C++ Builder, copyright Inprise Corporation.

The new debugger can do remote and multiple process debugging

The main use of C++ Builder is as a general-purpose RAD (Rapid Application Development) tool with the same visual form builder as Delphi, but using C++ rather than Pascal. More precisely, the VCL (Visual Component Library) in C++ Builder is the same as in Delphi, written in Pascal, but with clever trickery that lets you program the components as if they were C++. As a bonus, third-party add-ons designed for Delphi adapt easily to C++ Builder. You can even write Pascal units within C++ Builder, as Delphi and C++ Builder share the same compiler.

No surprise, then, that many of the new features in C++ Builder are the same

as those in Delphi 4.0. New action list components let you centralise the management of menu and toolbar items. There is new support for data-bound ActiveX controls, events in automation objects, and service applications for Windows NT. The updated BDE (Borland Database Engine) has support for Access 97 and, in the Enterprise version, Oracle 8. Together these add up to significant enhancements that keep

C++ Builder up to date. Other new features are solely for C++ developers.

One significant change is that the default data alignment has changed from 4 bytes to 8 bytes. This affects the size of structures and classes, and has been done solely for better compatibility with Visual C++, at the expense of worse compatibility with libraries compiled with old versions of C++ Builder. Other changes to the compiler, linker and runtime library have the same goal, and to underline the point a Visual C++ to C++ Builder project converter is included. Note that this will not convert a project to use the VCL; it merely enables you to edit and compile a Visual C++ project in C++ Builder. There is support for MFC (Microsoft Foundation Classes) and even an MFC project wizard, but if you choose this route you're on your own with the code editor thereafter.

C++ Builder is also a tool for building distributed applications through COM or CORBA, although for this you need the high-end Enterprise edition. There are project wizards for CORBA clients, servers, and IDL (Interface

Definition Language) files. Key to this support is the Visibroker ORB (Object Request Broker), bundled with the Enterprise version. Using CORBA, you can build cross-platform distributed applications that communicate with Java and Delphi clients and servers. Alternatively, Windows developers can use COM to create distributed applications. Here, the most significant enhancement is specific support for MTS (Microsoft Transaction Server), an essential part of robust, scalable COM-based applications. The new debugger can do remote and multiple process debugging, ideal for distributed projects.

The two obvious competitors to C++ Builder are Delphi and Microsoft Visual C++. Delphi uses a different language, but in most respects is a little ahead of C++ Builder, easier to learn and with faster compilation. There are still good reasons to use C++ Builder, either because you prefer the language, or to take advantage of C++ libraries, including MFC. Visual C++ is harder to compare directly. For productivity, C++ Builder easily comes off best, but then, Visual C++ does not pretend to be a RAD tool.

TIM ANDERSON

PCW DETAILS

★★★★★

Price Standard £99.00 (£84.26 ex VAT)
Professional £527.57 (£449.00 ex VAT)
Enterprise £1,996.33 (£1,699 ex VAT)

Contact Borland/Inprise 0800 454065
www.borland.com

Good Points Fast visual application building. Fast compilation. Supports both COM and CORBA.

Bad Points Uses Pascal for its component library. Visual C++ is better for MFC work.

Conclusion The best RAD tool for C++ developers, and ideal for those learning the language.

System Specification Pentium 90 or higher, 32Mb, Windows 95/98 or NT 4.0.

Canon BJC 6000

A good office worker.

Canon is one of the big names in colour inkjet printing, but it has always lagged behind rival Epson in terms of resolution. It aims to close the gap with the BJC 6000, which can achieve a maximum resolution of 1440dpi. It has also added optional six-colour printing to improve output quality, and claims print speeds of 8ppm mono and 5ppm colour.

The first thing to note is that the BJC 6000 can only achieve a print resolution of 1440dpi using a standard colour cartridge, which means that if you want hi-res printing, you'll have to stick to four colours. If you want the two extra shades offered by the photo colour cartridge, the maximum resolution is 720dpi.

Each of the inks within the cartridges is stored in a separate tank, so you can replace colours individually, which is more economical than

swapping out the whole cartridge when one colour is exhausted. However, if you do opt for six-colour printing, you'll find that the black ink tank is very small and runs out fast.

As far as print speed is concerned, Canon's estimates are as exaggerated as we've come to expect from inkjet printer manufacturers: in our tests, we found we could only output 1.7ppm of text and it took about 16 minutes for an A4 colour photo at maximum resolution on special paper.

To be fair, speed is not the essence of colour printing, but on standard paper print quality was nothing special either; there is severe grey banding on our all-black output and colours are less than vibrant. If you're prepared to splash out 60p per sheet for glossy paper, you do get better results, with vivid colours and realistic skin tones.

The BJC 6000 is fully networkable,



and an optional Axis PrintPoint 140 BJC print server allows the whole office to share the printer.

URSULA TOLAINI

PCW DETAILS

★★★★★

Price £251 (£213.62 ex VAT)

Contact Canon 0181 773 6000

www.canon.co.uk

Good Points Maximum resolution of 1440dpi. Six-colour printing

Bad Points Limited black ink capacity in photo cartridge. Poor results on plain paper.

Conclusion A good choice for an above average quality office printer, but for the best-quality results Epson's printers still win hands down.

Canon BJC 4400 Photo



Photoprinting without breaking the bank.

As the name suggests, the Canon BJC 4400 Photo is designed to print out photographs. It comes bundled with MGI's photo editing software PhotoSuite II, a sample of Canon's glossy paper and a photo ink

cartridge, to offer a low-cost entry to photo printing. It offers a maximum resolution of 720x360dpi, but it's also a lot cheaper than most high-resolution inkjet printers. The photo ink cartridge sticks with the four standard colours — cyan, magenta, yellow and black — but uses special low-density inks which allow the printer to vary the height of the dots of ink to offer improved shading. Canon also claims that its Drop Modulation Technology, used in all its new printers to vary dot size, produces sharper images.

In terms of ease of use, it's irritating to have to swap out the standard cartridge for the photo version each time you want to print a photograph, but the proof of a printer is in the output quality. On standard paper the 4400 is unimpressive, but results did perk up when we swapped over to special paper. We did find a bit of horizontal banding on our A4 colour photo on glossy paper, and there was some discolouration at the bottom of the

page, where each ink appeared to have separated out, but overall colours are bright and clear and skin tones lifelike.

Text printing was particularly impressive and the solid block of black was really good, with no evidence of banding. It managed to print 1.86ppm of text and took 10 minutes per page for an A4 colour photo on special paper. One nice extra is the ability to turn the 4400 into a 360dpi scanner by slotting in an optional IS-22 scanner cartridge.

URSULA TOLAINI

PCW DETAILS

★★★

Price £175 (£148.94 ex VAT)

Contact Canon 0181 773 6000

www.canon.co.uk

Good Points Low-cost photo printing. Good-quality printing on special paper.

Bad Points Needs glossy paper for best results. Have to swap cartridges for photo printing.

Conclusion If you're looking for a cheap way to print out photos, the BJC 4400 Photo certainly offers a good deal, but you'll have to spend a bit more for top-quality results.

AJP NeoPC

A space-saving flatpanel computer that's easy on the eye.

The NeoPC from AJP is only the second flatpanel computer we've seen here at PCW this year, and although very different from the MultiQ reviewed in January's issue, you can definitely see the concept taking off once the manufacturers get it right. Already, the AJP is not far off.

Falling halfway between a desktop and a laptop, the NeoPC is an upright box with a 15.1in TFT (Thin Film Transistor) screen bolted to the front. Initially, due to the high price and top specification, the NeoPC is likely to appeal to trend-conscious executives who want to save a bit of space (while impressing the colleagues) and salespeople who need a bit more power in their presentations.

Although there is a sturdy handle built into the top of the box, the unit is too heavy to carry around for more than a short time and requires that the keyboard and mouse be carried separately, although it's still much more mobile than a desktop.

The unit sent in for testing came with a Pentium III 500MHz processor, 128Mb of RAM and a fast 10Gb hard drive, so it's no wonder it beat the MultiQ by a long shot with a SYSmark 98 rating of 192. 3D graphics performance was healthy too, scoring 1036 3DMarks thanks to the supplied ATi Rage LT Pro AGP 2X chipset. The Rage Pro won't give you the full OpenGL experience just yet (the beta OpenGL drivers made the benchmarks crash), but it will handle most mainstream 3D applications brilliantly.

The immediate benefit of the flatpanel is that you suddenly find twice as much space on the average desk, but it's also worth pointing out that the quality of the screen is superb and is much better for your eyes in the long term than the traditional CRT (Cathode Ray Tube) monitor. The viewing angle isn't bad either, making the NeoPC ideal for presentations.

The graphics card comes with 4Mb of memory, allowing a resolution of 1024 x

768 with 16 million colours, and an external monitor can be used simultaneously at 1280 x 1024 with 24-bit colour. Sound is supplied by a SoundBlaster Pro compatible PCI sound card with 3D sound features, although the built-in speakers let the side down. The inclusion of volume up and down buttons on the front of the unit is a convenient bonus.

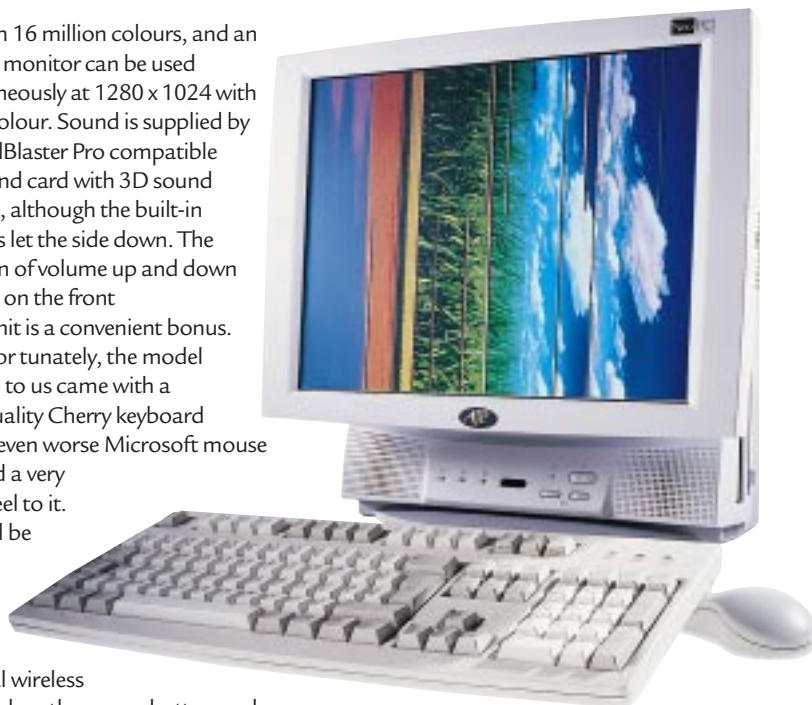
Unfortunately, the model shipped to us came with a poor-quality Cherry keyboard and an even worse Microsoft mouse that had a very flimsy feel to it. It would be a good idea to go for the optional wireless keyboard, as the power button and volume controls on the NeoPC are located just underneath the screen and just above the keyboard, making access to them quite difficult. The wireless keyboard communicates with the NeoPC via an infra-red port located near these buttons.

To get all the components of a desktop into the little box behind the screen, AJP has borrowed from laptop technology, with the added bonus that the NeoPC has convenient features such as full power management and PC Card

slots. Although PC Card peripherals will be more expensive than their desktop counterparts, the mobility

benefits and the added expansion opportunities are bound to suit the market that the NeoPC will initially be targeting.

As well as PC Card slots, there is one shared PCI/ISA expansion slot. And coupled with all this expansion potential, there is a full complement of ports at the rear of the unit, covered by a plastic strip, including serial, parallel, USB, PS/2 keyboard and mouse, and gameport. The test unit also came with an RJ-45 network port.



The NeoPC really does live up to AJP's moniker of 'The Next Generation Desktop'. Although initially pricey, it's easy to see the design catching on. Flat screens are slowly replacing CRT monitors in the mainstream, and AJP's use of PC Card slots, an IR port and USB ports means that this computer will still be useful a few years down the line.

BARRY DE LA ROSA

The NeoPC really does live up to AJP's moniker of 'The Next Generation Desktop'

PCW DETAILS

★★★★★

Price £2,206.65 (£1,878 ex VAT)

Contact AJP 0181 208 9744

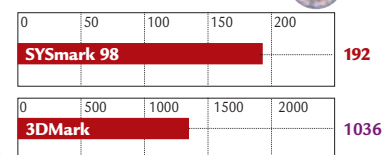
www.ajp.co.uk

Good Points Powerful, with plenty of features and an excellent screen.

Bad Points Buttons hard to access. Poor keyboard and mouse.

Conclusion A space-saving computer that's easy to move around, offering the power of a desktop with the convenience of a laptop.

PERFORMANCE RESULTS



TMC TI5VGF (v1.0) cache

PCI proves itself on this PC99-compliant motherboard.

Taking full advantage of the PC99 guidelines, TMC has dropped all the ISA slots on its TI5VGF (v1.0) Socket 7 motherboard in favour of six PCI bus slots on a standard ATX form factor board.

Adopting the faster PCI peripheral card alternatives is one advantage. As if to rub salt into ISA's wounds, you will also be able to take advantage of PCI's advanced resourcing support through the OS.

Most peripheral cards will require the allocation of one of 16 interrupt requests (IRQs), rather like priority channels to the processor, to get attention when they want to do something. The motherboard's integrated circuitry alone can take up over half the available IRQs, with more complex peripheral cards taking two. Whereas ISA peripheral cards would snatch an IRQ and keep it to



themselves, the OS can adopt PCI steering that allows for the sharing of IRQs between PCI devices.

Another striking feature is a whopping 2Mb onboard cache running at the same speed as the system bus, although AMD's K6-2 series of processors will make little use of this with their own processor-packaged Level 2 cache.

With the release of the K6-III, it's a whole new ball game. The core speed Level 2 cache re-enables the functionality of the motherboard cache through Tri-Level support, in essence turning it into a Level 3 cache. Performance improvements

of almost 15 percent can be seen when the onboard cache is enabled via the BIOS – much more than the reserved claims made by AMD. With three DIMM slots, DIP switches for personalised settings and the welcome return of low-level formatting through the BIOS software, TMC hasn't shirked its responsibilities elsewhere, either.

IAN ROBSON



PCW DETAILS



Price £93.99 (£79.99 ex VAT)

Contact TMC Technology (UK)
01438 842305

www.tmc-uk.com

Good Points Performance boosting 2Mb on-board cache.

Bad Points Installation instructions unclear.

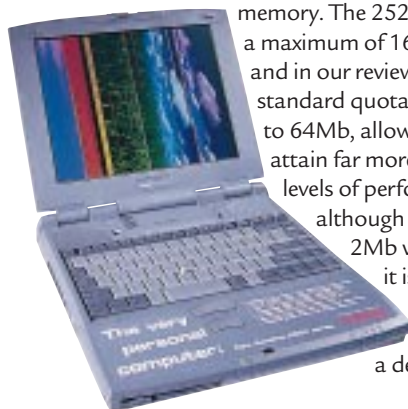
Conclusion Performance-hungry users won't be disappointed with this quality build and innovative design.

Toshiba Satellite 2520CDT

A sturdy, well-equipped notebook for those in need of retail therapy.

Toshiba's Satellite 2520CDT has been developed as an entry-level model particularly for consumers likely to purchase through the retail channel. While sharing many of the design aspects of the other Satellite models, this machine is not dockable, but is still considered a complete solution for the home business or small office user.

Processing power, courtesy of AMD's 300MHz K6-2, is slightly let down by the standard supply of 32Mb system memory. The 2520 caters for a maximum of 160Mb RAM and in our review machine the standard quota was doubled to 64Mb, allowing it to attain far more acceptable levels of performance, although with a mere 2Mb video memory it is never likely to find much of a role as a desktop replacement. That said, its S3 Virge M5 graphics sub-system is capable of supporting external interlaced displays at resolutions up to 1280 x 1024, refreshing at 60Hz simultaneously with its own internal display. This is at the much-reduced 256-colour support, but for simple presentations it's still quite a tempting feature.



A 12.1in colour TFT screen with a native resolution of 800 x 600 is housed in an extremely sturdy plastic casing. Image quality is remarkably good, with a bright and even display across its whole surface. The rest of the chassis is also built to industry standards. The reassuringly thick plastic shell is likely to withstand the more sluggish user. It still manages to retain some of its sleek curves, and one eye-catching feature is the integrated speakers, located above the full keyboard. These managed to reproduce quite acceptable resonance for their size. Completing the minimum user requirements is a 4.03Gb hard disk, a 24X CD-ROM drive, a floppy drive and all the usual I/O ports, which includes one infra-red and one USB. An innovative touch was to include a built-in 56Kbps modem, leaving the two PC Card slots free for other peripheral device use.

IAN ROBSON

PCW DETAILS



Price £1,495 (£1,272.34 ex VAT)

Contact Toshiba Information Systems
01932 828828

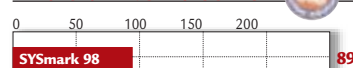
www.toshiba.co.uk/computers

Good Points Sturdy build. Built-in modem.

Bad Points Standard supplied memory quota needs boosting.

Conclusion A fully-equipped and sturdily built notebook that will serve its purpose quite admirably.

PERFORMANCE RESULTS



Route 66 Britain 99

Get your kicks with this user-friendly **route planning package**.

The tag line on the box reads 'From Street to Street' and this highlights one of Route 66's many assets – the ability to roll your mouse across roads and even small residential streets, and to have the road highlighted and the name displayed.

Route 66 is very easy to use.

With the Waypoints tool, users need only click on the origin and destination of their journey. A more powerful form-based interface allows the user to specify a number of destinations and select whether they are travelling by lorry or car. This approach also gives options for calculating the fastest, shortest, cheapest or most economical route ('cheapest' considers wear and tear on the car; 'most economical' only considers petrol costs). It also allows users to specify whether the multiple destinations should be visited in



the order selected or the most efficient order. By selecting the Distance tool and a point on the map, moving the pointer around the screen will then continuously measure and update the distance between the pointer and the original location. This is an as-the-crow-flies measurement rather than the distance you would have to travel to make the same journey by road. Route 66 will

show detailed directions that can be printed. Roundabout descriptions are a little confusing: 'turn 2/4 on roundabout' means take the second exit. 'Second exit' would have been easier to comprehend. Business users should appreciate this package, however, while day trippers will enjoy planning routes to different places of interest, including a rather mysterious 'Buckingham Palast'.

NIK RAWLINSON

PCW DETAILS

★★★★★

Price £49.95 (£42.51 ex VAT)

Contact Route 66; 00 31 318 64 55 69 (Netherlands) www.route66.nl

Good Points Easy to use. Very detailed.

Bad Points Directions could be clearer.

Conclusion A useful product at a reasonable price.

Pico Mini-Note

Another entrant in the busy **'small' notebook market**.

The introduction of the Toshiba Libretto helped to redefine the concept of 'small' in the notebook market. Since then, this segment has seen a flurry of similar products. The Pico Mini-Note is the latest entrant. Weighing less than 1.5kg, the Mini-Note has a 10.4in TFT screen which is quite adequate for regular office work. It supports a maximum optimum resolution of 1024x600. The screen is not very bright, however, which might pose a problem in brightly-lit environments.



be accessed by removing a screw at the bottom of the case. Pico does, however, offer various optional component upgrades at the time of purchase.

The Mini-Note is powered by a 266MHz Pentium II, has 64Mb of RAM and a 4Gb internal hard drive. The 24X CD-ROM is connected through a PC Card slot that can

alternatively accommodate a modem, and a separate floppy drive is connected through the parallel port. The Silicon Motion Lynx graphics adapter provides a good 2D display.

The keyboard, despite its small size, is quite easy to use and responsive, but the nipple controlling the mouse is not so user-friendly. Although the internal components of the Pico Mini-Note are generally not easy to upgrade, the hard drive can nonetheless

Despite the small form factor of the Pico Mini-Note, heat is not a problem. Neither the underside of the notebook

nor the screen becomes uncomfortably hot even after prolonged use.

Performance of this notebook isn't quite earth shattering, but should suit most business-application users.

AJITH RAM

PCW DETAILS

★★★★★

Price £1,181.57 (£1,005 ex VAT)

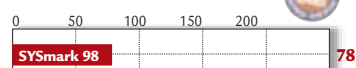
Contact Pico 01483 402111 www.picodirect.co.uk

Good Points Low price. Good performance. Small size. Responsive keyboard.

Bad Points Performance is not optimum due to a fairly run-of-the-mill processor.

Conclusion A small but versatile notebook that's worth looking at.

PERFORMANCE RESULTS



Backpack CD-Rewriter

A 4X parallel port CD-Rewriter with **flexibility and versatility.**

External storage for backup purposes is a must-have, and the advantage of using a CD-Rewriter, such as the Backpack CD-Rewriter from MicroSolutions, is that you can back-up data and make compilations of your favourite music CDs as well. There are a number of CD-Rewriters on the market, many of which use a SCSI interface, which may leave you wondering why you would want to buy a parallel port CD-Rewriter when surely a SCSI connection would be better for fast data transfer?

MicroSolutions has come up with a new controller chip to solve the speed problem. The company claims that this will allow a 650Mb CD to be created in 20 minutes. But when we tried it out using the supplied Easy CD Creator software, a 650Mb CD took 40 minutes



on a Pentium II 350MHz with 64Mb SDRAM. Still, even compared to SCSI CD-RWs, that's not to be sniffed at.

The new controller does allow the Backpack to write at 4X on nearly any Pentium-based PC or notebook with a standard EPP/ECP port. It will rewrite at 2X and read CD-ROMs at 6X. As it makes use of DMA for transfers through the parallel port, it doesn't tie up the CPU as much — useful if you want to carry on working while creating a CD.

There are advantages in not being tied to an expansion card, but the Backpack is really too heavy and bulky to be very portable. Half-size drives are on the production line, however. The software bundle includes Direct CD and Easy CD Creator.

LYNLEY ORAM

PCW DETAILS

★★★★★

Price £390 (£331.91 ex VAT)

Contact MicroSolutions
001 815 756 3411
www.micro-solutions.com

Good Points External. No expansion card required. Compatible even with a wide range of Pentium-based PCs and notebooks.

Bad Points Not as fast as it claims. Poorly documented and structured installation routine.

Conclusion As a removable storage option, it is flexible and versatile, and as a bonus you can make your own music CDs.

Hi-Grade Notino AS7400

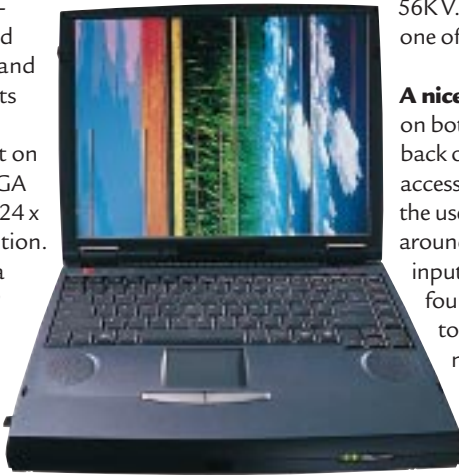
Heavyweight notebook provides a **worthy desktop replacement.**

The first thing you notice is that this 366MHz mobile PII notebook is large and heavy.

The pay-off, though, is that it's a true desktop replacement. A

Matsushita DVD-ROM drive should keep you happy, and the TV-out sockets mean you're not forced to watch it on the 14.1in TFT XGA display with a 1024 x 768 native resolution. This is driven by a Rage LT Pro AGP x2 graphics chip with 4Mb SGRAM memory and hardware DVD MPEG-2

playback. Storage is handled by a generous 6Gb IDE drive, while the 96Mb RAM should see most users satisfied for at least the next couple of



years. If you feel the need, it can be expanded to a maximum of 288Mb. Lotus SmartSuite Millennium is pre-installed, and a DataFax modem

is supplied in the form of a 56K V.90 PCMCIA card in one of two available slots.

A nice touch is the IR ports on both the front and the back of the unit, making access easy without forcing the user to turn the machine around. All jacks for sound input and output can be found clustered together to the left of the

machine, while a flap to the rear conceals the usual serial, parallel, USB and external monitor

ports. This also hides the docking port (a sliding door gives access without the need to flip the flap). The keyboard incorporated a euro key but was a little

disappointing, giving little in the way of feedback. Overall, though, we were impressed.

NIK RAWLINSON

PCW DETAILS

★★★★★

Price £2,348.83 (£1,999 ex VAT)

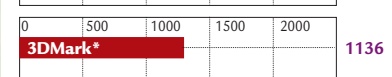
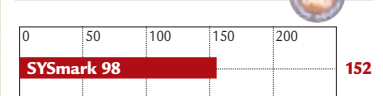
Contact Hi-Grade 0181 532 6100
www.higrade.com

Good Points Hardware DVD decoding. Fairly fast for a notebook.

Bad Points Disappointing keyboard. Heavy. Could not achieve desired resolution for graphics tests.

Conclusion A worthy desktop replacement.

PERFORMANCE RESULTS



*@ 800 x 600 resolution

Headline Studio 2

The fast track to **fine animation.**

Generating banners and animations can be a time-consuming process, often requiring the user to build up the various stages individually on a frame-by-frame basis. Creating a two-second animation could take half a day, but with MetaCreations's Headline Studio, that process can be completed in around 30 seconds. The screen consists of a number of palettes controlling colour, effects,

fonts, tools and download rates, alongside the actual working area. The size of the banner is illustrated by a red outline; objects falling outside of this will be cropped. Space-saving features include the ability to reduce the levels of colour from 256 (the maximum for a GIF) through a variety of increments down to 4, and specify, between 1 and 100, the number of frames in the animation. The effect such changes

make can be monitored using the download capacity options that simulate every link between a 28.8Kbps modem and a T1 line.

The centrepiece of the package is the timeline. This defines the beginning and end of the animation and allows the user to skip through to the precise point they need. It also controls playback of the work

in progress. After placing an object in the work area, a range of effects such as blurring, size change or a variation in opacity can be applied. Any number of effects can be applied simultaneously. Getting an object to move across the screen is as simple as dragging it from the start point to its destination. Headline Studio 2 will remember the track and append it to the final animation.

NIK RAWLINSON



PCW DETAILS

★★★★★

Price £210.33 (£179 ex VAT)

Contact Computers Unlimited
0181 358 5857

www.metacreations.com

Good Points Easy to use. Quick. Effective.

Bad Points Fiddly interface. Expensive.

Conclusion Dramatically reduces time spent creating animations. Well worth considering.

Ask A4 Compact

Enter **presentation heaven** with the lightweight A4 Compact projector.

The LCD projector seemed like a good idea. You took red, green and blue LCD screens, sent a strong beam of light through each, merged the result via a prism, and focused it on to a distant screen. Hey presto... you had a wall-sized computer display.

Sadly, you needed a big budget to buy one (prices were upwards of £7,000) and big muscles to carry it. The LCD projector was consigned to presentation hell, where all music sounds as if it has been generated by a tone-deaf computer with a grudge against humans, and all talk centres on bullet points and bar charts. In short, it was a yawn.

The Ask A4 Compact shows the LCD projector escaping into a wider world of beauty, action and mellifluous sound. It weighs just 3.5kg, packs into a shoulder bag, offers true SVGA (800 x 600) resolution, and is priced within the budget of a small firm — the word is that



prices will fall further. Norway-based Ask claims its 560-lumen light source is one of the brightest available. It comes with a remote control, RGB computer and stereo audio input, and a monitor output so that you can have a separate computer display. Better still, options

include input from video or TV, so that you can use it as a mini cinema.

Naturally, companies who use the projector primarily for presentations will need this latter function to show corporate videos. We would be the last to suggest that executives might be influenced in their buying decision by the fact that the A4 Compact can also be taken home to show movies. That would be a tax-free perk, wouldn't it?

CLIVE AKASS

PCW DETAILS

★★★★★

Price £5,047 (£4295 ex VAT) list;
£3,872 (£3,295 ex VAT) street

Contact Ask 0753 701050 www.ask.com

Good Points Sturdy, elegant design.

Bad Points Still beyond most private pockets.

Conclusion Honestly, boss, it will be really useful.

Novatec 300 Office PC

Budget system

For the hobbyist or those looking for a second PC.

The Novatec 300 is great for the hobbyist. Without a monitor or an OS it's not quite a whole system, so it's not going to compete with the off-the-shelf all-in-one solutions we review in group tests. We're also a bit dubious about including the word 'Office' in the name when it doesn't include any bundled software, but for users who want to experiment in setting up a cheap mail server, or who are looking for a better than bare bones system upon which to build a custom machine, this is a great start. Many users will, after all, have an old 14in monitor they can add.

The brain of the 300 is a Cyrix MII/IBM 6x86MX processor clocked at 300MHz. This has no onboard cache and so makes use of the 1Mb L2 cache on the motherboard. With an eye on the future, this 100MHz motherboard can accept all processors up to a 400MHz AMD K6-2.

The spine of this PC is an SiS 530 chipset on a Super 7 board. The 3D graphics processor is built in, and shares the main system

memory: the BIOS allows you to select 2Mb, 4Mb or 8Mb of the installed SDRAM to be allocated to video.

Upon arrival this was set to 8Mb, leaving only 24Mb available to play with. Although this may be a little stingy for Windows, it should be more than adequate for a more conservative OS, such as Linux. Users who dislike this approach will welcome the motherboard's option to go for standalone video RAM instead. The 32Mb RAM installed is supplied on a single DIMM, offering opportunities to upgrade this at a later date using the remaining vacant slot.

The motherboard also hosts the onboard sound chip, an Elite 3DX. There are no speakers, but at this price you can't really expect that. The keyboard is fairly average. It includes a euro key and is comfortable enough to type on for extended periods. We were disappointed,

though, that Novatec had not supplied a 5-pin DIN to PS/2 adapter so that we could connect it to the PC. The SpaceWalker mouse, meanwhile, is excellent, fitting well into the palm of the hand and rolling smoothly. The case interior is tidy and well ordered. Cables are held back in place with ties, leaving unobstructed access to the memory and expansion slots. With everything onboard, the two PCI and one shared slots all sit empty, offering plenty of scope for customisation in the future. A 40X speed CD-ROM drive and standard floppy cater for data input, and a further two external bays — one 5.25in and one 3.5in — allow for the addition of further drives at a later date.

The hard drive is mounted vertically within the case, keeping well out of the way of the horizontal drive cage and leaving room for another 3.5in internal device to be fitted.

The Fujitsu hard drive itself runs to an adequate 3.24Gb, which should suit most needs.

Inspecting the insides of the MicroATX mini tower case is easy, as the external housing swivels backwards or can be lifted clear of the internal chassis for unobstructed access. Around the back are a couple of USB ports, two PS/2 connections for mouse and keyboard, parallel and game ports. There is only one serial port, which is a shame, as fitting an external modem would gobble it up right away. The motherboard hosts connectors for a second port, which could be mounted on a blanking plate if you're willing to sacrifice an expansion slot. As the machine's sound capabilities are welded onto the motherboard, integrated



mic, audio in and audio out ports also find a home for themselves on the back panel.

If anyone had told us there was a £299 PC on the market, we might have laughed, expecting a poor-quality machine in which every cut-able corner had been snipped to the nth degree. That is not the case here. For the hobbyist on a tight budget, or users after a second machine to play around with, this represents a great buy.

NIK RAWLINSON

PCW DETAILS



Price £351.33 (£299 ex VAT)

Contact Novatech 0800 072 7771

www.novatech.co.uk

Good Points Inexpensive. Well-organised interior.

Bad Points It had difficulty completing our performance tests. No monitor. No OS bundled.

Conclusion Great for the hobbyist, although there are more suitable buys for the first-timer.

HP PhotoSmart C30

Digital photography at a price you can snap up.

Opting for an RGB filter rather than the CMY alternative, HP has produced a camera well suited to putting snaps on a web site. The supplied 4Mb CompactFlash memory card is sufficient to capture between 8 Superfine and 40 Basic quality images. Its highest resolution of 1152x872 pixels will be enough to produce 'photo quality' 3in x 5in prints.

While it boasts an impressive 500 photos on a single set of AA batteries, the quality of the images the C30 produces sadly lets it down. Colours were not true to the original subject matter and were not as sharp as those produced by many other digital cameras. That said, at £399 the



C30 is affordable enough to put digital photography within the reach of the average home user.

Close-ups are handled by the 2X digital zoom. An optical zoom would have been preferable, but would have been reflected by a higher price tag. We were also a little disappointed by the LCD on this generally unattractive unit. It has a slow refresh, updating only every second or so. The shutter is also slow to

react: press the button, and the picture will be taken a second later — no good for action shots. The built-in flash has a red eye reduction facility, and the C30 is

bundled with a power adaptor, batteries, cables for PC and video connection, and a shoulder strap. The 10-second self-timer allows the user to be in his or her own photos, while the bundled Microsoft Picture It! 99 software and HP PhotoSmart Photo Finishing Software make downloading and organising your snaps a breeze.

NIK RAWLINSON

PCW DETAILS

★★★★

Price £468.83 (£399 ex VAT)

Contact Hewlett-Packard 0990 474747

www.photosmart.com

Good Points Easy to use. Excellent PhotoSmart software. Conservative battery consumption.

Bad Points Disappointing pictures. Slow to react to shutter button.

Conclusion A reasonable buy for rough-and-ready web shots.

NaturallySpeaking Mobile

A voice recognition package that transcribes from a digital recorder.

Now is around the auspices of the working odious piece of the place... er, no, I won't try to dictate this review. Neither shall I be unfair to Dragon NaturallySpeaking Mobile that, like all voice-recognition packages, requires a certain amount of perseverance to get it to work. In return, it sometimes throws out some wild poetry.

NaturallySpeaking was one of the first commercial packages to take dictation in continuous speech, as opposed to Talking...Like...This. You still have to adapt your voice though, just as you would for a



human transcriber (who, like the machine, would still get some words wrong).

Early adopters have tended to be people who need it most: non-typists, the handicapped, and people who have to transcribe screeds of boring text. I have been thinking onto a keyboard for years and find the effort of dictation disruptive. But Dragon's latest product, NaturallySpeaking Mobile, which transcribes from a digital recorder, is potentially so useful that I am determined to have another stab.

It is not a new idea. A UK firm demonstrated a similar system three years ago, and at Comdex last year Dragon named a number of digital recorders, including a Sony minidisk, that can be used for the purpose. If you have one of these, or are thinking of getting one, check with Dragon's web site for compatibility with NaturallySpeaking Preferred Edition, which costs £129 inc VAT.

The Mobile edition is basically this plus a solid-state recorder that fits snugly into the hand like a cellphone. It holds 40 minutes of dictation as it comes and more than an hour more using a plug-in SmartMedia card. This is far less than a minidisk machine, but at £199 including VAT and software, it is also far cheaper. I have yet to reach a useful accuracy, but I am told that it is possible. I propose to persevere and I'll keep you posted.

CLIVE AKASS

PCW DETAILS

★★★★

Price £199 (£169.36 ex VAT)

Contact Dragon Systems UK 01242 678575 www.dragonsystems.com

Good Points Voice recorder is a big advance.

Bad Points Learning can be aggravating.

Conclusion Be prepared to work at making it work.

Fax machines vs the PC-based solution

Despite the rise of email, we have yet to see the corresponding demise of the fax. But the very means you use to send and receive electronic mail, your modem, provides you with an alternative to the humble fax machine. A fax/modem allows you to use your PC to send and receive fax messages, but before you turn your back on the fax we take you through the pros and cons of each method.

? The case for the fax machine

The first obvious advantage of choosing a standalone fax machine is that you don't need to own a PC to use one. But if you already have a PC, there are still benefits to sticking with a traditional fax machine.

For instance, you can free up your PC's system resources for more important tasks: you don't have to use up space on your hard drive storing faxes, and valuable memory isn't wasted running software to help your modem pick up and send faxes. Most cheap modems do come with software that allows them to act as fax machines, and if you want to leave your fax line open, your PC must be switched on and the bundled fax software must be running in the background. But if you're running a memory-hungry

You don't need a PC to be able to use a standalone fax machine

application, and your fax software kicks in to allow you to receive, your PC could crash, losing all your unsaved data.

If you use a single connection to link up to the net and receive faxes, then

your modem will have to support DSVD (Digital Simultaneous Voice and Data) which splits the bandwidth to

accommodate both access to the internet and fax calls. Unfortunately, splitting an already slim bandwidth slows down performance to a snail's pace. On the other hand, leaving your fax machine plugged in to a separate phone socket

keeps your fax line open all the time, ready to receive messages.

The role of a fax machine

doesn't stop there: many act as both telephone and answer-phone too, so while a modem might look like a cheap solution, when you look at all the tasks a fax performs, then the relatively higher price tag is justified. A fax machine is also handy for any hardcopy documents you need to sign and return.

If you move into the realm of the multifunction device, which combines a fax with scanner,

copier and printer, the benefits for a small office

are manifold. These all-in-one peripherals are more expensive than a basic fax machine, but they're generally a lot cheaper than the sum of their parts. A multifunction device twinned with your PC provides you with everything you'll need to set up an office at home or for a small business. Obviously, the more people you have sharing each device, the less efficient it will become, but it's a cost-effective solution for the smaller workgroup.

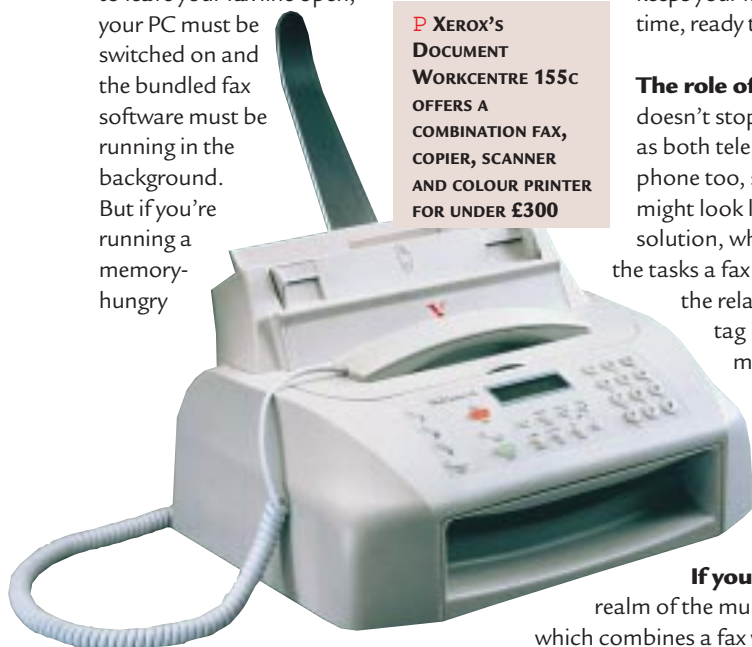
Hewlett-Packard's OfficeJet 700 is pretty pricey at £506.43, but it combines a colour and a black-and-white fax with a 600x300dpi colour printer, 300dpi optical resolution scanner, and copier. The black-and-white fax works both with or without a PC, though you do need a PC for colour faxing. It can store up to 50 pages of faxes, so you don't need to worry about leaving your PC up and running to receive your messages.

If this price seems steep, Xerox has a budget all-in-one device. The Document WorkCentre 155c costs just £249. It combines a standalone fax, which can also work with your PC, plus memory to store up to 21 pages, with a copier, scanner and colour printer.

One disadvantage of the all-in-one route is that if your multifunction device does break down, you are left without access to any of its features. This criticism



HP's OFFICEJET 700 MULTIFUNCTION DEVICE ADDS A FEW EXTRAS TO THE STANDARD FAX MACHINE, INCLUDING COLOUR PRINTING AND SCANNING, MAKING THE WHOLE CONCEPT EVEN MORE ATTRACTIVE FOR A SMALL BUSINESS OR HOME USER



XEROX'S DOCUMENT WORKCENTRE 155C OFFERS A COMBINATION FAX, COPIER, SCANNER AND COLOUR PRINTER FOR UNDER £300

Faxing from Windows

Anyone who has Windows 98 installed will have noticed that the old fax program found in 95, Microsoft Fax, has disappeared. This was part of the Windows Messaging email system and provided a full-featured fax program, but in Windows 98 Windows Messaging has been replaced by Outlook Express, a new email client that's also part of Internet Explorer 4. If you have upgraded from Windows 95 to Windows 98 you should still have Microsoft Fax installed on your PC anyway, so you can continue to use it in exactly

the same way as before. If you do want to send a fax from Windows 98, you have to use one of three methods: Use Outlook in Microsoft Office, use the software that came with your modem, or buy a separate fax program. If you have Microsoft Office 97 loaded on your PC, all you have to do is install Outlook and you can use its default fax program, which is Microsoft Fax, so it's just like using Windows 95. Most modem manufacturers provide fax software with their products, and while these may not offer all the features found in



Q PACKAGES LIKE WINFAX PRO PUT A FAX MACHINE ON YOUR PC DESKTOP. WITH THEIR 'BROADCAST FAX' CAPABILITIES, THEY ALLOW YOU TO SEND DOCUMENTS TO NOT JUST ONE RECIPIENT BUT MANY PEOPLE AT ONCE

models like the Pace 56 Solo or the Olitec Smart Modem Deluxe, they should be sufficient for basic faxing needs. However, you will suffer from the problem of leaving software running in

the background if you want to receive a fax. Finally, there are third-party fax software packages you can buy to allow you to fax from your PC, such as Symantec WinFax Pro at £116.

can be levelled at any purely PC-based fax solution, because if your computer falls ill, then your fax machine is out of order too. If you keep all your office equipment separate by opting for a standalone fax, at least you can rely on it even if your PC gives up the ghost. So when modern technology lets you down once again, you might be glad that you chose the old-fashioned route and opted for a trusty fax.

? The case for a PC-based fax

If you want to keep it simple and use your PC to handle all your messages, then a fax modem is your best bet. As we have mentioned, there are drawbacks with cheaper fax modems that require you to leave your computer on with software running in the background to enable you to get incoming faxes. But a new

generation of modems is addressing this problem by storing faxes for you even when your computer is off.

The Pace 56 Solo external 56Kbits/sec modem can store up to 30 pages of faxes or 30 minutes' worth of voice messages for you. It allows you to print out faxes directly without the need to view them first, but both

computer and printer must be switched on to output hard copies. If you just want to know how many faxes you have, you can press a button on the front of the modem to find out. At £199 the Pace 56 Solo is a lot cheaper than a multifunction device, though you can

pick up a standalone fax for less. For example, the Brother FAX-510 thermal fax machine costs only £175.08.

A fax modem will also give you access to the internet

Olitec's Deluxe Smart Memory Modem offers much the same functionality as the Pace 56 Solo, combining a V.90 56Kbits/sec modem with a fax and answerphone that work even when your computer is powered down. At £139.95 it's even cheaper than the Pace modem and offers more fax storage, holding 100 pages, but you can only record

20 minutes of voice messages.

One real bonus of choosing a fax modem to handle your faxes is that it will also give you access to the internet. Both Olitec's and Pace's are 56kbits/sec modems, but it's important to note that the maximum fax transmission speed they can provide is 14,400bps. This is faster than the FAX-510 though, which can only achieve 9,600bps.

If you want hard copies of your faxes, you'll have to have a printer hooked up to your PC, but this does mean you have control over the quality of the final printouts. More expensive plain paper faxes allow you to print faxes onto standard A4 copier paper, but the cheaper thermal units can only use special rolls of paper which is flimsy, curls easily and degrades over time.

If you need to file faxes to keep for some time, you'll have to opt for a more



Q THE PACE 56 SOLO MODEM IS ONE OF A NEW GENERATION OF FAX MODEMS WHICH CAN ACCEPT FAX MESSAGES EVEN WHEN YOUR PC IS SWITCHED OFF, AND STORE THEM FOR YOU TO HANDLE LATER

Sending a fax via the web

You can avoid choosing between a fax and fax modem by letting a web-based faxing service take the strain. Digital Mail is a UK company that offers a range of services that can handle both receiving and sending your fax messages via the internet. It charges £49.95 per year to turn your email account into a full messaging centre. Its CommsGate service provides you with two telephone numbers, one for voice and one for faxes, either or both of which can be diverted to preset telephone numbers. If a call is unanswered, the message is taken and forwarded to your email account. This enables you to pick up all your

messages from anywhere in the world when you check your email, but as you can only receive faxes, not send them out too, this is a one-way service. Digital Mail also offers a Virtual Fax Box service for £7.75 per month, plus communication charges, that allows you to both send and receive faxes via the web. All you have to do is create an email and include the fax number you want to send it to in the special Digital Mail domain name, and its server will recognise the type of message you want to send and route it to the right fax machine. This service includes a Universal Notifier,



which informs you when a message comes into your mailbox via a voice call, fax, email or SMS message — ideal if you spend a lot of time out of the office.

DIGITAL MAIL PROVIDES WEB-BASED SOLUTIONS FOR ALL YOUR MESSAGING NEEDS, FROM TAKING YOUR CALLS TO SENDING OUT YOUR FAX MESSAGES

expensive plain paper fax, or a multifunction device.

If you are more concerned about the quality of the fax you are sending, then a fax modem is a good choice. In a traditional fax machine a row of sensors, like those in a scanner, read the image you are sending and convert it into data. If there's a flaw in your fax's sensors or the page is inadvertently skewed during sending, then the quality of the sent fax will be affected. Very fine type or detailed graphics are also hard for the sensors to deal with.

A fax modem takes pre-imaged data as supplied by the fax modem driver

(which is just like a printer driver).

It works at whatever fax resolution you have selected (usually Regular to Fine or Superfine) and graphics and text are created 'cleanly' at that resolution, so the final result should be picture perfect.

Choosing a fax modem is probably the cheapest option, and with the latest, more expensive models you can receive

... graphics and text are created 'cleanly', so the final result should be picture perfect

faxes even when your PC is switched off. You can also choose the quality of sent faxes, and print out those you receive to good-quality paper using your own printer. However, as the real problem with cheaper solutions is with receiving faxes rather than sending them, perhaps the failsafe solution is to invest in a cheap fax machine to handle incoming faxes, but send out all your faxes from the comfort of your desktop.

URSULA TOLAINI



Q BROTHER'S FAX-510 IS A LOW-COST THERMAL FAX. IT'S A COMPACT LITTLE UNIT WHICH CAN MANAGE ALL YOUR INCOMING FAXES WITH EASE

PCW CONTACTS

Brother 0161 330 6531
www.brother.com
Digital Mail 0171 919 9900
www.digitalmail.com
Hewlett-Packard 0990 474747
www.hp.co.uk
Microsoft 0345 00 2000
www.microsoft.com/uk
Direct Source (for Olitec)
 0118 981 9960 www.olitec.com
Pace 0990 561001 www.pacecom.co.uk
Symantec 0171 616 5600
www.symantec.co.uk
Xerox 0800 454197 www.xerox.co.uk



Illustration by Kevin Evans

Getting it together

TIM ANDERSON LOOKS AT OFFICE 2000 AND THE COLLABORATIVE WORKING POSSIBILITIES IT ALLOWS.

If you already own an office suite, and the vast majority of users do, then why would you want a new one? Word processors and spreadsheets, still the core applications, are typically in their sixth or seventh versions and should be fully functioning and fully featured.

But software companies need to survive and selling upgrades helps them do so. They need to offer the user significant improvements, either in terms of new features or easier ways of working.

Office 2000 is the third version for 32-bit Windows. Although Office 95 was the natural choice for those moving to Windows 95, two and a half years ago Office 97 was a harder product to sell. One of its key selling points — that the new Office Assistant would reduce support calls and increase productivity — fell flat as the first question many users asked was, how to disable it. They also discovered that Office 97 was not more reliable and even incorporated new bugs like the images in Word which resized themselves when a document was saved. Worst of all, Word and Excel sported new file formats which could leave users looking at strange binary symbols if they had not upgraded.

So, the relentless upgrade cycle was hard to resist. Of course, it wasn't all bad. Developers were happy with the much-improved Visual Basic for Applications, and Outlook has proved a flexible, if quirky, groupware client.

Microsoft is not pretending that Office 2000 introduces dramatic improvements in word processing, spreadsheeting, creating presentations or managing databases. Each application has new features but most are minor changes, although there are important

improvements for those deploying and managing Office installations. Most file formats are the same as before, with Access being the only exception. However, the reason most users will want to upgrade to Office 2000 is a new way of working based on web-enabled collaboration.

The idea is that as paper-based document management is giving way to electronic communication, it's time for a new approach ➤

New look-and-feel

There are some things in Office 2000 that you will notice immediately. Personalised menus and toolbars adapt to your usage pattern, showing only the options you actually use. The full range expands on demand. Online help uses HTML and includes an answer wizard which responds to English language questions, with the usual mixed results.

When you press F1 or click the help icon, the Office application in which you are working resizes itself so that the help window fits alongside rather than on top of your document. It sounds a good idea but in practice is distracting, unless you have a particularly large screen. If Word or Excel is not maximised, it leaps about unpredictably as you open and close the help window.

Office 2000 has generally abandoned the Multiple Document Interface used extensively in previous versions. **When you open a second document in Word, it opens in a separate window that looks for all the world like another instance of Word.** It has its own taskbar entry and appears on that alt-tab menu loved by serious Windows users.

The odd thing, though, is that File / Exit closes all the Word documents, not just the current one. Another odd thing is that Excel is still Multiple Document Interface, although open Excel documents do appear on the taskbar and alt-tab menu. So, although it is easier to keep track of open documents, the new Office is not consistent.

Word 2000

Aside from its XML support, Word has some handy new features. Auto-correct now uses the main spelling dictionary as well as its own list. Click and type lets you double-click in any blank area of a document and have a new text or graphic appear exactly there, rather than automatically moving itself to the end of the previous line.

Collect and paste is a multiple clipboard, available throughout Office, which has 12 separate compartments rather than the stingy single area of the standard Windows item. Automatic language detection enables you to use spelling and grammar checkers on multiple languages in a single document.

► **THIS WORD DOCUMENT SHOWS THE INSTANT EMAIL TOOLBAR, THE NEW-STYLE HELP AND AN EXPANDABLE MENU**



Tables are improved, and you can now nest one table within another for more flexibility. There are many more HTML features within Word including frames, scripts, HTML source editing, picture bullets and web themes as used in FrontPage. The print dialogue lets you print multiple pages on a single sheet, and scale them to fit.

The new email button in Word is brilliant. Rather than opening a mail client, it simply lets you assign a recipient to the current document and send it straight away. The same address book and email options are available as in Outlook or Outlook Express. The one piece of bad news is that it uses HTML, even for contacts where you have specified plain text messages.

Excel 2000

Rumour has it that when Microsoft updates Office, not all the applications get major changes. Some simply receive cosmetic changes to tide them over until next time. Excel is in the 'little changed' camp on this occasion. Like Word, it has HTML support which works like a native file

format. It works fairly well, although a 200K Excel workbook changed itself into over 1Mb of web files in our tests. **The result displayed fine in Internet Explorer but not in Netscape Navigator, although smaller worksheets could be viewed in either browser.** There is also an Excel Web Component which enables you to embed a spreadsheet in a web page. Like Word, Excel benefits from instant email capacity and the new multiple clipboard.

Other new features are thin on the ground unless you are interested



▲ **NEW PIVOT CHARTS COMBINE CHARTING WITH PIVOT TABLES**

in multi-dimensional data. Here, there are numerous

enhancements. Pivot charts are graphical views on pivot tables, with the same interactive features for changing your mind about how to analyse data. In both cases, there are new drop-down lists that let you filter the data displayed. There are also links to OLAP (Online Analytical Processing) data sources, a feature aimed particularly at the OLAP services in SQL Server 7.0.

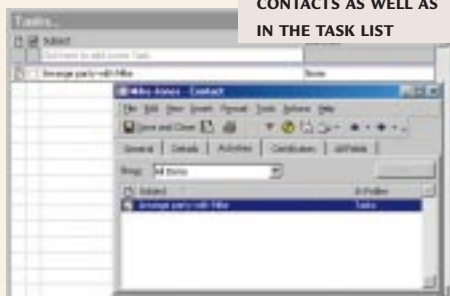
Finally, Euroconvert is a natty new function which automatically converts between the currencies of any Eurozone member. The UK is listed as a possible future addition.

Outlook 2000

The problem with Outlook 2000 is that most of its new features are already in Outlook 98, which was a free upgrade to Office 97. There are a few points of interest, though. First, you can now link items such as tasks, appointments and messages with one or more contacts. These then show up in a new Activities tab in the contact details. Since this is an essential feature of a contact manager, it's strange it wasn't there before. Secondly, Outlook can now handle resources such as meeting rooms and equipment in its meeting planner. Essentially, these are

treated in the same way as people, with an email account and free/busy records, and Exchange automatically accepts and rejects meeting invitations. But unfortunately, Exchange is required before this will work.

▼ **THE NEW OUTLOOK DISPLAYS A TASK IN THE ACTIVITIES TAB OF RELATED CONTACTS AS WELL AS IN THE TASK LIST**



which exploits what an online document can do. The innovation in Office 2000 is not in how documents are created, but how they are shared and used.

The best way to explain this is from the end-user's perspective. Typically, a user today would save their work either directly to their PC's hard disk or to a public folder on a file server. In Office 2000, a third option is to save to a web folder such as that on a company intranet, which appears in the Save dialogue as just another location. Documents saved in this way can be opened by other Office 2000 users or, if saved in HTML, viewed by anyone able to point their web browser at that site.

Furthermore, others can comment on your document by creating or contributing to a discussion which can be stuck in the middle of the text like a sticky note, or linked to the whole document. The folder can be searched using a web-style search page, by word or by document properties such as author and category. You can also set up a subscription to receive automatic emails informing you of new documents, or changes to existing ones. In this model, the document is no longer an item that has to be physically sent or even emailed to its recipients. Instead, it is published to an intranet site where it becomes a focus for collaboration. The model also extends to databases via a new feature of Access, Data Access Pages, which enables you to publish a database form while maintaining live links to the source data.

Many of the same benefits are available through a simple publicly shared folder, but the Office 2000 approach adds ease of use along with benefits like discussions and Data Access Pages. There is also a psychological difference. Saving a file to a network share does not seem like publishing a document, but in the new model this is clearly what is happening and fits with the current interest in knowledge management.

Casting a glance sideways, Lotus SmartSuite and Corel WordPerfect Office also provide web features. SmartSuite Millennium has Net-it Now, a third-party product which converts documents to Java, along with FastSite, a tool for quickly publishing SmartSuite documents on the web by converting them to HTML or Java.

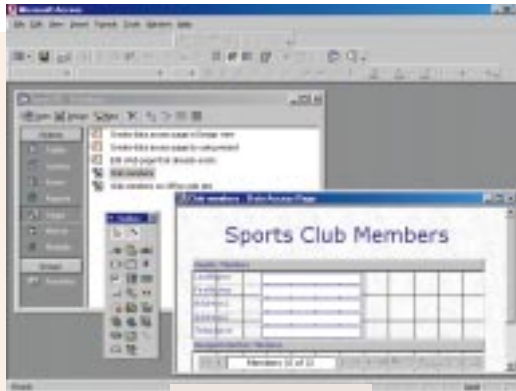
Corel's WordPerfect Office has 'NetDocs' (this name may change) which works like a printer driver, converting documents to HTML, Adobe PDF or Java, for web publishing. You can set this to automatically update a web copy when the source document changes. Corel Paradox also has a built-in web server for publishing live data.

The key difference is that only Microsoft Office 2000 lets you seamlessly load and save HTML so that the web document can be the

Access 2000

There are major changes in Access 2000. First, there are Data Access Pages which behave much like old-style forms except they are really web pages and are saved as external files. Other Office 2000 users can browse to the page and view the data. One likely destination is an Office web site, which provides an easy way to publish dynamic data on an intranet. You can also email a page, in which case you are sending a live link to the source data.

There are two snags with Data Access Pages. Firstly, they only work on PCs with Office 2000 installed, which breaks the seamless compatibility that good intranets offer. Secondly, there is a difficult interaction between Data Access Pages and Access security. Although in theory you can happily publish and email Data Access Pages all over the network, all the Access security features still apply



▲ **DESIGNING A DATA ACCESS PAGE IN ACCESS 2000**

so the client needs to be able to find not only

the data but also the workgroup information file which stores the security details. In testing, there were also problems with browser security, with mysterious warnings concerning the access of data across domains, even on a single, small intranet. **You can expect configuration issues, but this is still a great way to publish data.**

Also new is a type of file called an Access Project. This looks much like an MDB, but links to an SQL Server database. A cut-down SQL Server is bundled with Office, so client-server computing is now part of the package.

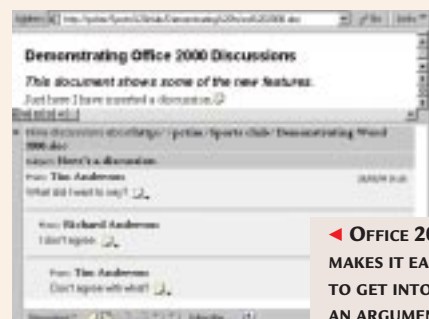
Managing Office 2000

Office 2000 is good news for network administrators. Install On Demand, which automatically installs optional product features on first use, makes it easy to customise your applications or find new import filters. Detect And Repair claims to fix problems like missing or corrupted files or registry entries. There are also some excellent new features for developing custom solutions, particularly COM add-ins, a new way to extend Office applications with Visual Basic code. Outlook now supports the full Visual Basic for Applications.

▼ **THE OFFICE WEB IS A NEW WAY TO PUBLISH, SEARCH AND DISCUSS OFFICE DOCUMENTS**



Administrators also face the task of installing the Office Server Extensions if people want to use an Office web. The extensions run on Windows NT 4.0 or the forthcoming Windows 2000 with either Internet Information Server or the Personal Web Server. They include the FrontPage 2000 extensions, and SQL Server is used to store web discussions. User permissions are managed via the NT 'user manager' and NTFS (NT File System) security. Administrators can also view and edit active discussions and document subscriptions.



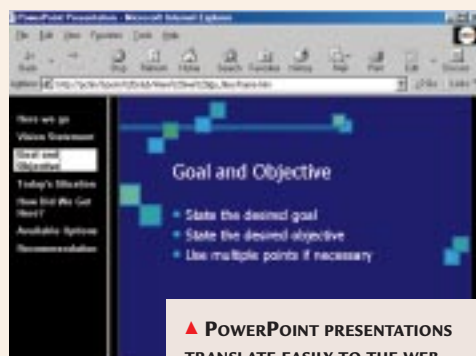
◀ **OFFICE 2000 MAKES IT EASY TO GET INTO AN ARGUMENT**

PowerPoint 2000

You won't find major innovations in PowerPoint 2000. The new web features are particularly useful in PowerPoint, though, and there is a dual output option which provides support for Netscape, as well as Internet Explorer, by publishing two versions with a script that detects the browser and acts accordingly. Unfortunately, it looked far better in Explorer. **New editing features include native table tools and graphical bullets, ideal for web sites.** And, you can embed scripts within presentations.

A small but important point for laptop users is that

PowerPoint automatically disables power-saving during a



▲ **POWERPOINT PRESENTATIONS TRANSLATE EASILY TO THE WEB, AS LONG AS YOU USE INTERNET EXPLORER**

slide show, preventing those embarrassing blank screens in the middle of your most important point of the presentation.

WIN

3 Olympus C-830L cameras

20 copies of Microsoft Office 2000



READER SURVEY >>

1999 Service and

▶▶▶ Take part in our survey and have the chance

It is time for the second *Personal Computer World* Service and Reliability Survey! With your help, our comprehensive, independent readership research survey will provide the ultimate guide to the best brands for technical support, product efficiency and reliability.

All completed questionnaires, with full name and address details, will be entered into a prize draw to win one of the following prizes: 3 x **Olympus C-830L cameras**, 20 copies of **Microsoft Office 2000** and 20 copies of **Microsoft's Money 99**; PLUS 50 copies of the latest **PCW on CD-ROM** (CD-ROM of the past 24 issues of the magazine, with full search and browse facilities).

PCW has employed the services of Maritz Research, one of the world's largest research groups and a leader in the field of customer satisfaction and loyalty research, to compile and deliver the ultimate performance guide to computer equipment. Share your experience with us, in

confidence, and we will produce a comprehensive report that maps which brands in the PC and printer markets really pull their weight when it comes to service and reliability. The findings of this report will appear in an issue of *PCW* later this year.

Please follow all instructions given and complete all relevant questions. Please tick the appropriate boxes.

To return your completed questionnaire, cut out the pages or photocopy them and post to the freepost address shown on page 123. Alternatively, if you would like to complete this survey online, please access it at www.pcwsurvey.co.uk and follow the instructions.

➔ We would like to emphasise that all responses will remain anonymous and will be used only in overall reports to represent general feelings and opinions. Maritz Research, an ISO 9001 registered company, is bound by the Market Research Society Code of Conduct, thus ensuring confidentiality. Many thanks for your participation.

YOUR DESKTOP PC

Please **ANSWER THE QUESTIONS** for your most recent purchase

Question 1

Please specify the **MANUFACTURER** of your desktop PC, e.g. **DO NOT** list the supplier or model details.

Question 2a

Please indicate your processor type.

- 1 Intel
- 2 AMD
- 3 Cyrix
- 4 Other
- 99 Don't know

Question 2b

What is the speed of your processor?

- 1 <200MHz
- 2 233-300MHz
- 3 333-400MHz
- 4 433MHz+
- 99 Don't know

Question 3

How much did your PC cost?

- 1 Below £500
- 2 £501-£800
- 3 £801-£1000
- 4 £1001-£1500
- 5 £1501 - £2000
- 6 £2000+
- 99 Don't know

Question 4

How long ago did you purchase your PC?

- 1 Less than a month
- 2 1-3 months
- 3 4-6 months
- 4 7-12 months
- 5 1-2 years
- 6 2+ years
- 99 Don't know

Question 5a

From where did you purchase your PC?

- 1 Mail Order or Direct from manufacturer
- 2 Superstore or High Street Retailer
- 3 Other
- 99 Don't know

Question 5b

How did you make your purchase?

- 1 By telephone
- 2 By email
- 3 From the web
- 4 In person
- 5 By post
- 6 Other
- 99 Don't know

Question 6a

What is the PC used for?

(Please tick all that apply)

- 1 Games
- 2 Business/office
- 3 Education/reference
- 4 Creative/graphics/sound/video
- 5 Programming
- 6 Other

Question 6b

Who uses this PC?

- 1 Only myself
- 2 Others infrequently
- 3 Others frequently

Question 7

How long is the **standard** warranty cover for your PC?

- 1 3 months
- 2 6 months
- 3 1 year
- 4 2 years
- 5 3+ years
- 99 Don't know



20 copies of Microsoft Money 99



50 copies of the past 24 issues of PCW on CD-ROM

Reliability Survey

to win some of the great prizes shown above ◀ ◀ ◀

Question 8a

Did you purchase an **extended warranty**?

- 1 Yes 2 No
 If 'yes', please answer Q8b-Q8d, otherwise please go to Q9

Question 8b

What **extra period** does this cover?

- 1 One additional year
 2 Two additional years
 3 Three or more additional years
 99 Don't know

Question 8c

How much did the **extended warranty cost**?

- 1 Less than £50 2 £50-£100
 3 £101-£200 4 £201+
 99 Don't know

Question 8d

What **type of cover** was included in the **extended warranty**?

- (Please tick all that apply).
 1 Parts only 2 Parts and labour
 3 24hr helpline 4 Replacement PC
 99 Don't know

Question 9

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following?

- (Please circle)
 Q9a Helpfulness of the sales staff n/a 1 2 3 4 5
 Q9b Understanding of your needs by the sales staff n/a 1 2 3 4 5
 Q9c The quality of advice you received n/a 1 2 3 4 5
 Q9d System arrived on time n/a 1 2 3 4 5
 Q9e Order was complete & correct n/a 1 2 3 4 5
 Q9f Everything was in working order n/a 1 2 3 4 5

Question 10

Has your PC ever broken down? (Broken down = technical failure and thus no longer capable of performing required tasks.)

- 1 Yes 2 No (go to Q13d)
 99 Don't know (go to Q13d)

Question 11

How many problems have you had with your PC in the past 6 months that prevented the use for which it was bought?

- 1 None (please go to Q13d)
 2 1
 3 2-3
 4 4+
 99 Don't know (Please go to Q.13d)

Question 12

Using the following comments, please classify the types of problem you experienced:

- (Please tick all that apply)
 1 'Dead on arrival'
 2 Failure due to hard drive component
 3 Failure due to floppy disk drive component
 4 Failure due to CD-ROM drive component
 5 Failure due to sound card component
 6 Failure due to video card component
 7 Monitor/display panel problem
 8 Failure due to virus
 9 Failure due to RAM (Random Access Memory)
 10 Problems with CPU (Central Processor Unit)
 11 PC would not boot up
 12 PC freezes or hangs up for a long time
 13 Network adapter problem
 14 Problems caused by software
 15 Ports (I/O)/Connectors
 16 Casing problem (i.e. cracked case)
 17 Keyboard problem
 18 Other
 99 Don't know

Question 13

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following? (Please circle)

- Q13a Helpful manner of the support staff n/a 1 2 3 4 5
 Q13b Time taken to solve the problem n/a 1 2 3 4 5
 Q13c The solution provided n/a 1 2 3 4 5
 Q13d The overall reliability of your PC n/a 1 2 3 4 5

Question 14

On a scale of 1-5, with 1 being 'very unlikely' and 5 being 'very likely', what is the likelihood of you...

- (Please circle)
 Q14a Repurchasing the same brand of PC in the future? n/a 1 2 3 4 5
 Q14b Recommending this brand of PC to your colleagues/friends? n/a 1 2 3 4 5

Your Notebook PC

Please **ANSWER THE QUESTIONS** for your most recent purchase

Question 15

Please specify the **MANUFACTURER** of your notebook PC. **DO NOT** list the supplier or model details

Question 16a

Please indicate your processor type.

- 1 Intel 2 AMD
 3 Cyrix 4 Other
 99 Don't know

Question 16b

What is the speed of your processor?

- 1 <200MHz 2 233-300MHz
 3 333-400MHz 4 433MHz+
 99 Don't know

Question 17

How much did your notebook PC cost?

- 1 Below £500 2 £501-£800
 3 £801-£1000 4 £1001-£1500
 5 £1501 - £2000 6 £2000+
 99 Don't know

Question 18

How long ago did you purchase your notebook PC?

- 1 Less than a month
 2 1-3 months 3 4-6 months
 4 7-12 months 5 1-2 years
 6 2+ years 99 Don't know

Question 19a

From where did you purchase your notebook PC?

- 1 Mail Order or Direct
 from the manufacturer
 2 Superstore or High Street Retailer
 3 Other
 99 Don't know

Question 19b

How did you make your purchase?

- 1 By telephone 2 By email
 3 From the web 4 In person
 5 By post 6 Other
 99 Don't know

Question 20a

For what is your notebook PC used?

(Please tick all that apply)

- 1 Games
 2 Business/office
 3 Education/reference
 4 Creative — graphics/sound/video
 5 Programming
 6 Other

Question 20b

Who uses this notebook PC?

- 1 Only myself
 2 Others — infrequently
 3 Others — frequently

Question 21

How long is the standard warranty cover for your notebook PC?

- 1 3 months 2 6 months
 3 1 year 4 2 years
 5 3+ years 99 Don't know

Question 22a

Did you purchase an extended warranty?

- 1 Yes 2 No

If 'yes', please answer Q22b-Q22d, otherwise please go to Q23

Question 22b

What extra period does this cover?

- 1 One additional year
 2 Two additional years
 3 Three or more additional years
 99 Don't know

Question 22c

How much did the extended warranty cost?

- 1 Less than £50 2 £50-£100
 3 £101-£200 4 £201+
 99 Don't know

Question 22d

What type of cover was included in the extended warranty?

(Please tick all that apply)

- 1 Parts only 2 Parts and labour
 3 24hr helpline 4 Replacement PC
 99 Don't know

Question 23

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following?

(Please circle)

Q23a Helpfulness of the sales staff n/a 1 2 3 4 5

Q23b Understanding of your needs by the sales staff n/a 1 2 3 4 5

Q23c The quality of advice you received n/a 1 2 3 4 5

Q23d System arrived on time n/a 1 2 3 4 5

Q23e Order was complete and correct n/a 1 2 3 4 5

Q23f Everything was in working order n/a 1 2 3 4 5

Question 24

Has your notebook PC ever broken down?

(Broken down = technical failure and thus no longer capable of performing required tasks.)

- 1 Yes 2 No (go to Q27d)
 99 Don't know (go to Q27d)

Question 25

How many problems have you had with your notebook PC in the past 6 months that prevented the use for which it was bought?

- 1 None (go to Q27d)
 2 1
 3 2-3
 4 4+
 99 Don't know (go to Q27d)

Question 26

Using the following comments, please classify the type of problems you experienced:

(Please tick all that apply)

- 1 'Dead on arrival'
 2 Failure due to hard drive component
 3 Failure due to floppy disk drive component
 4 Failure due to CD-ROM drive component
 5 Failure due to sound card component
 6 Failure due to video card component
 7 Display panel problem
 8 Battery or power supply failure
 9 Failure due to virus
 10 Failure due to RAM (Random Access Memory)
 11 Problems with CPU (Central Processor Unit)
 12 PC would not boot up
 13 PC freezes or hangs up for a long time
 14 Network adapter problem
 15 Problems caused by software
 16 Ports (I/O)/Connectors
 17 Casing problem (i.e. cracked case)
 18 Keyboard problem
 19 Other
 99 Don't know

Question 27

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following?

(Please circle)

Q27a Helpful manner of the support staff n/a 1 2 3 4 5

Q27b Time taken to solve the problem n/a 1 2 3 4 5

Q27c The solution provided n/a 1 2 3 4 5

Q27d The overall reliability of your notebook PC n/a 1 2 3 4 5

Question 28

On a scale of 1-5, with 1 being 'very unlikely' and 5 being 'very likely', what is the likelihood of you...

(Please circle)

Q28a Repurchasing the same brand of PC in the future? n/a 1 2 3 4 5

Q28b Recommending this brand of notebook to your colleagues/friends? n/a 1 2 3 4 5

YOUR HANDHELD COMPUTER

Please **ANSWER THE QUESTIONS** for your most recent purchase

Question 29

Please indicate the type of handheld computer you have?

Windows CE

- 1 Casio 2 Compaq
3 Everex 4 Hewlett-Packard
5 Hitachi 6 LG
7 NEC 8 Sharp

Psion

- 9 Series 3 (a/c/mx) 10 Series 5

3Com

- 11 PalmPilot 12 PalmPilot Pro
13 Palm III

- 14 Nokia 9000 15 Other
99 Don't know

Question 30

How long ago did you purchase your handheld computer?

- 1 Less than a month
2 1-3 months
3 4-6 months
4 7-12 months
5 1-2 years
6 2+ years
99 Don't know

Question 31

From where did you purchase your handheld computer?

- 1 Mail Order or Direct from manufacturer
2 Superstore or High Street Retailer
3 Other
99 Don't know

Question 32

Do you regularly connect your handheld computer to your PC?

- Q32a** For backup? 1 Yes 2 No 3 n/a
Q32b For diary synchronisation? 1 Yes 2 No 3 n/a
Q32c For file exchange? 1 Yes 2 No 3 n/a
Q32d For email or web access? 1 Yes 2 No 3 n/a

Question 33a

Did you purchase an extended warranty?

- 1 Yes 2 No
If 'yes', please answer Q33b-Q33c, otherwise please go to Q34

Question 33b

What extra period does this cover?

- 1 One additional year
2 Two additional years
3 Three or more additional years
99 Don't know

Question 33c

How much did the extended warranty cost?

- 1 Less than £50 2 £50-£100
3 £101-£200 4 £201+
99 Don't know

Question 34

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following?

(Please circle)

Q34a Helpfulness of the sales staff n/a 1 2 3 4 5

Q34b Understanding of your needs by the sales staff n/a 1 2 3 4 5

Q34c The quality of advice you received n/a 1 2 3 4 5

Q34d Everything was in working order n/a 1 2 3 4 5

Question 35

Has your handheld computer ever broken down? (Broken down = technical failure and thus no longer capable of performing required tasks.)

- 1 Yes 2 No (go to Q38d)
99 Don't know (go to Q38d)

Question 36

How many problems have you had with your handheld computer in the past 6 months that prevented the use for which it was bought?

- 1 None (go to Q38d)
2 1 3 2-3
4 4+
99 Don't know (go to Q38d)

Question 37

Using the following comments, please classify the types of problems you have experienced:

(Please tick all that apply)

- 1 Screen display problem
2 Casing problem (i.e. cracked case)
3 Battery problem
4 Keyboard problem
5 Ports or I/O
6 CPU/memory
7 Data storage device (i.e. removable flash card)
8 Other
99 Don't know

Question 38

On a scale of 1-5, with 1 being 'very dissatisfied' and 5 being 'very satisfied', how satisfied are you with the following?

(Please circle)

Q38a Helpful manner of the support staff n/a 1 2 3 4 5

Q38b Time taken to solve the problem n/a 1 2 3 4 5

Q38c The solution provided n/a 1 2 3 4 5

Q38d The overall reliability of your handheld computer n/a 1 2 3 4 5

Question 39

On a scale of 1-5, with 1 being 'very unlikely' and 5 being 'very likely', what is the likelihood of you...

(Please circle)

Q39a Repurchasing the same brand in the future? n/a 1 2 3 4 5

Q39b Recommending this brand to your colleagues/friends? n/a 1 2 3 4 5

PRIZE DRAW DETAILS

If you wish to be entered into our Prize Draw, please fill in **all** the details below:

Title Initials Surname Job Title

Address

.....

Postcode Email address

Tel Fax

From time to time you may receive communications from companies other than VNU.

Tick here if you do not wish to receive them.

PLEASE RETURN TO: Maritz Research, Freepost SCE8343, High Wycombe, HP11 1ZA

Mad scramble

THE THREAT OF **KEY ESCROW** HAS GONE AWAY — BUT IT COULD BE BACK. DANIEL SABBAGH TRACES ITS TROUBLED HISTORY AND AWAITS A GOVERNMENT/INDUSTRY-INSPIRED ALTERNATIVE.

Encryption and its regulation by the Government has become the most controversial issue in the IT industry over the past five years. It has been the subject of a sustained rebellion by big business, in an unlikely alliance with cyber-liberties groups, against politicians. It has seen one ex-government IT minister admit that his policy was wrong just a week before the current IT Minister announced a partial back-down over plans to regulate its use. And the debate has been dogged by unproven accusations that successive government policies, Tory and Labour, are just a front for the interests of intelligence agencies MI5 and GCHQ.

Yet encryption is also crucial to the future of electronic commerce. How can the stuff of spy thrillers also be the technology of SSL transactions? What on earth is going on?

This year, the Government plans to pass an e-commerce Bill — late April saw its first publication. It aims to clear up the laws governing e-commerce in a new Labour bid to make the UK 'the best environment worldwide in which to trade electronically by 2002'. It is this long-awaited Bill, that will regulate e-commerce, which has been the subject of three years of intense debate and persistent controversy since the plans to regulate e-commerce first emerged in 1996.

Caspar Bowden, director of the Foundation for Information Policy Research (FIPR), says: 'The public introduction of cryptography lit a slow-burning fuse that has created the most intractable civil liberties dilemma of the computer age and paralysed public policy on how the explosive growth of the net should be regulated.'

This March, after more than two months of waiting, the debate should have come to an end. The Government was expected to lay down the law, by publishing the principles for the e-commerce Bill which even then was only weeks

away. It failed to do so. Instead, the Government partially backed down, giving the industry just over three weeks, until 1st April, to come up with a better policy in the most controversial area of the Bill: encryption. The result is a policy which, at the time of writing, is in some disarray.

What the Government wanted to do, and had to retreat over, was find a way of controlling the use of encryption by tapping it.

Encryption is used to scramble email messages to make them unreadable to prying eyes and ensure financial transactions on the web are unhackable.

The problem is that the only encryption worth having cannot be cracked by the fastest supercomputers. That's no problem for Joe Public, but it's a big worry for governments. Their concern is the use of the internet by organised crime. How can you prove that drug money or mob messages were sent from Colombia to Manchester, or that somebody has pornography on their hard drive, when you cannot crack their code?

The Government, in short, is scared of good encryption. The development of it has, until the internet came along, always been tightly regulated. The only centres of expertise were intelligence organisations; in Britain, an arm of Cheltenham-based GCHQ, the Communications Electronics Security Group (CESG). Even when academic publication began in the seventies, encryption was tightly controlled and today encryption policy has not recovered from the grip of intelligence agencies. But the explosion of the internet in the early nineties made its impact; it made encryption necessary for e-commerce. At the same time, the internet provides an easy means to evade national jurisdiction and distribute encryption technology beyond government efforts at regulation — and it comes with a vibrant pioneering culture opposed to any government control.

The Government's plans to regulate the use of e-commerce took two forms. Firstly, it wanted to provide legal backing to a secure form of identification — digital signatures; effectively an encrypted certificate backed by a third party which proves you are who you claim to be. Secondly, the Government wanted to tap into the encryption used for scrambling messages and transactions in the same way that phone calls and post can be intercepted.

The mechanism chosen is generally called 'key escrow'. Encrypted messages are created using keys (very long numbers). Key escrow means that a third party holds a copy of your private encryption key, which it would give over to law enforcement agencies if required.

Key escrow has always been controversial. Opposition from loud-mouthed cyber libertarians would have come as no surprise to the Government and was a lobby it doubtless believed it could safely ignore. Yet the concerted opposition that followed from big business must have been surprising. Neil Barrett, a security expert with Bull Systems, said: 'The Government didn't anticipate that level of opposition. But if you look at the people who came out against key escrow, most of them are reasonable, sensible, business people.'

The plan first surfaced, bizarrely, in an independent analysis of the security needs of the network for the National Health Service, NHS net, published in April 1996. It proposed an encryption system for doctors which should support key escrow and hinted that it was likely to become a standard restriction on the use of encryption in the UK.

Early fears focused on the perceived invasion of privacy. Doctors saw encryption as a tool to secure patient data across new health networks; key escrow was a licence for the Government to hack in to medical secrets. To this day, IT-savvy GPs in the British Medical Association remain deeply opposed to key escrow.

Other arguments emerged which proved more successful. Firstly, key escrow is not technology-neutral, a point which later began to worry the banks. Secondly, the internet's global nature meant that the policy was practically unenforceable. Criminals were hardly likely to use UK-mandated key escrow if they could get away with it.

Despite the objections of the BMA, the last Conservative government bought the proposal. Just two months before 1997's general election, Ian Taylor, then IT Minister, published a plan to regulate the use of e-commerce. Rather long-windedly, it effectively insisted that virtually everybody adopted key escrow by stating that all

providers of encryption services, to be called Trusted Third Parties (TTPs), had to be licensed. A condition of licensing was key escrow.

TTPs do have some use in e-commerce. They can provide external validation for digital signatures, date- and time-stamping services, provide encryption software or even generate encryption keys for you, and can list a directory of users with a link to their encryption keys so you can send them scrambled email.

This March, the Post Office launched the UK's first major home grown service for businesses. But the licensing condition was a special extension. Its core purpose was to permit the tapping of encryption, although the DTI tried to argue that business would want a facility to recover lost or forgotten encryption keys.

Now the Government got serious. Business began to wake up and became very concerned. Objections were led by whole sections of the technology industry. But more importantly, opposition came from the banks, who were most likely to launch TTP services, led by the banks' trade body, APACS.

Steve Thomas, head of security with APACS, said: 'We accept that there is a need to meet the needs of law enforcement, but key escrow has always been the wrong way to do it.'

Banks realised that the proposals were not technology neutral and could have an impact on their existing encryption systems, many of which had been obtained under special licences. Key escrow was totally technologically unproven, costly to implement, potentially unpopular with customers, and was not proving popular in competitor economies. Countries such as Germany, Canada and Ireland were not intending to adopt key escrow, despite American pressure.

Labour appeared, in Opposition, to be against

The new policy at a glance

- **Key escrow to be dropped if industry can come up with a better alternative.**
- **Special industry/government taskforce created to consider alternatives.**
- **Emphasis on maintaining existing legal powers to intercept and access email.**
- **Digital signatures to be made legal when backed up by a licensed certification authority, or when covered by existing contract law.**
- **No escrow of digital signatures.**
- **Voluntary licensing of certification authorities.**
- **Consultation on the problems of legal liabilities in e-commerce.**
- **Consultation on the problem of spam email.**
- **No change in export controls of cryptographic products.**

the plan, stating in a pre-election policy document that was to be repeatedly quoted (and in reality taken too seriously) by anti-escrow campaigners: 'Attempts to control encryption are wrong in principle, unworkable in practice and damaging to the long-term economic value of corporate networks.'

When the Labour Party won the election, the policy was thrown into limbo. What came out the other side was another dose of key escrow. A consultation document appeared in April 1998 backing key escrow through the licensing scheme. This time, the scheme became voluntary as a concession to growing criticism. It also added a clear decision to make digital signatures legal, but then undermined this by linking this to key escrow. The Government did not want escrow — to take copies of citizens' or companies' digital signatures, which clearly would have been a very

Ministers told industry that the Government was **PREPARED TO DROP KEY ESCROW** if business could come up with a better solution

worrying development — but it did say the only legal digital signatures would be those which were validated by a licensed TTP, one that used key escrow. The Government also appeared to forget that some encryption standards, such as s/Mime used in Microsoft Outlook, generated encryption and digital signatures from the same key.

The result was an outcry which failed to go away — an alliance of civil liberties groups, banks, doctors and the IT industry. And the lobbying intensified when the Government announced last November that it was going to legislate. All eyes were on a final consultation paper which would outline the principles in the Bill, promised before or shortly after Christmas '98.

The paper was held up when Peter Mandelson, who was rumoured to want to drop key escrow, resigned as boss of the DTI. In the meantime, the final blows against the policy were struck in public hearings in Parliament, of the Commons Trade and Industry select committee. With canny timing, the select committee began the hearings into e-commerce. It heard a remarkable range of opposition to the key escrow policy, from banks to the Post Office and legal and cryptography academics. Only the police, in the form of the heavyweight National Criminal Intelligence Service, were in favour. The writing was on the wall. And finally, Ian Taylor, now an ex-minister, publicly recanted. Just a week before the final government consultation paper arrived in

March, the man who introduced the policy said: 'I'm beginning to think that I was wrong.'

When the paper came out, the Government gave in. The decision was leaked after a business breakfast held at Number 10, attended by Tony Blair, the Prime Minister, and Home Secretary Jack Straw, with Trade Secretary Stephen Byers, as well as chairmen and chief executives of IT and telecommunications companies. Over breakfast, ministers told industry that the Government was prepared to drop key escrow if business could come up with a better alternative. A special government-industry task force, called Cojet, has been set up (1st April) to find a solution. But the Government told the industry it was still concerned about the use of strong encryption by criminals, leaving a difficult balance to be struck.

In a press conference, IT Minister Michael Wills did his best to put a positive spin on the climbdown, while warning that if no better solution could be identified, then key escrow could be back. The paper also retained the idea of voluntary licensing of TTPs, to set minimum service standards, but did not link it to key escrow.

Digital signatures would be made unambiguously legal if they were validated by a licensed Third Party — a contorted process which FIPR's Bowden describes as a 'stump from the old policy which should be cut off'. But the Government also admitted that in most cases digital signatures were legal, rendering the licensing process not strictly necessary. For good measure, the Government chucked in a consultation of whether it should legislate on the growing levels of spam email and the balance of legal liabilities in electronic commerce transactions. The reaction was, in the words of APACS' Steve Thomas, 'two cheers'. Now the race is on for a compromise solution.

The preferred approach from industry is two-pronged. First, replace key escrow with a simpler and cheaper legal requirement to compel a plain text version of an encrypted document or communication from a suspect. Second, invest serious money in a public/private partnership into creating a centre of expertise in investigating crime involving computers, which could include the development of monitoring techniques which don't require the creation of a complex, costly system with no other useful purpose.

Getting the compromise right will be vital. Nicholas Lansman, secretary-general of the Internet Service Providers Association, said: 'The Government has had three years to get this right. We've got three weeks. But we've got to do it; we have to make e-commerce work for everyone.' □

● *Daniel Sabbagh is senior reporter on Computing magazine.*

PCW CONTACTS

Further information
www.starfish.com
www.imc.org/pdi
www.argosoft.com/vcard.html



Illustration by Simon Downs

Feel the



force

We pitch the solid, reliable Pentium II head to head against the exciting but unproven Pentium III, in ten systems from five manufacturers.

Intel's launch of the Pentium III placed a large question mark over the future of the Pentium II, as the natural evolutionary process dictated its demotion in the processor ranks. With the focus placed on the shiny Katmai New Instructions (KNI) sported by the Pentium III, and the Celeron firmly positioned as the budget choice, what does the Pentium II have left to offer? This is what we have asked PC vendors to consider, by inviting them to submit both a Pentium II and a Pentium III, priced at £1,500 (ex VAT) and with 128Mb system RAM and a minimum 17in monitor. We were looking for machines pitched for a business user with a stress on graphics, including 3D image rendering. This very much left the forum open to promote the trusted Pentium II machines bolstered with money not spent on the latest and greatest from Intel.

The Pentium III machines were tested blind and unoptimised initially, but we also ran optimised tests to bring out the performance benefits of KNI. With software vendors producing plug-ins or patches to upgrade their existing products in support of KNI, will these benefits really champion the Pentium III?

Contents

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PCs reviewed by Ian Robson

Ratings

- ★★★★★ Buy while stocks last
- ★★★★ Great buy
- ★★★ Good buy
- ★★ Shop around
- ★ Not recommended

Armari MBX-450e, NBX-K500

Armari has a reputation for supplying powerful PC monsters, possibly stemming from its roots as a high-end workstation and server-class system manufacturer. It deals with its on-site maintenance requirements through a contract with Computer Maintenance Direct. And although the technical support section consists of just three staff, by some mean feat Armari still manages to produce an impressive service record: it won our Editor's Choice award for technical support in our last 'blind buying' group test [December '98].

At first glance, there was little difference between the two systems supplied. Both had an excellent 56Kbps PCI modem from Diamond and a quality 17in monitor from Iiyama. However, both systems had relatively limited storage compared to other PCs in this test, each making do with a 10.1Gb EIDE hard disk. It's not necessarily the applications but their by-products and end results that dictate massive requirements and with no removable storage media, 10.1Gb will quickly fill up.

The 450MHz Pentium II machine, MBX-450e (shown above) is a little better endowed than first impressions would have you believe. Armari has had the foresight to extend its lifespan by supplying a dual processor board, opening up possibilities not just for an extra Pentium II, but, when your budget can stretch to it, a leap up to tandem Pentium III processing.

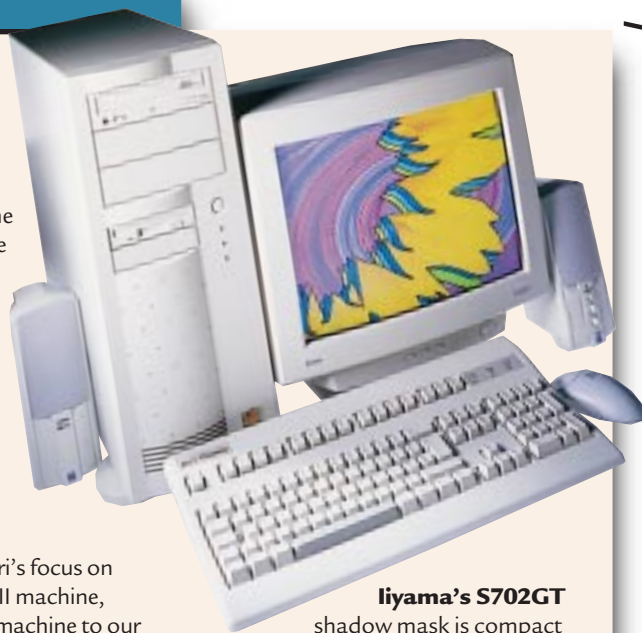
The 500MHz Pentium III machine, model NBX-K500 (below) performs quite admirably

with its 16Mb ATI Xpert 128 graphics subsystem, but Armari had a little something left in the pot to fork out for the fuller 32Mb ATI Rage Fury on the PII. This gives it the massive boost in multimedia performance that makes it one of the top PII systems and even above its own PIII counterpart.

Judging from Armari's focus on performance in the PII machine, the company built a machine to our direct specifications, which is very reassuring when you consider that other vendors tend to dictate what they think you may require. Still, a shortfall in money has left a standard CD-ROM media drive, albeit a 40X, an economy version of Creative Labs' SoundBlaster 64V PCI sound card and a pair of quite unbearably tinny speakers. All these areas would no doubt have been addressed more seriously if we had specified, but as it stands, they are not beyond an end-user's means to deal with at a later date.

There was evidently money to spare on the PIII machine after the core expenditure on Intel's latest processor. Sporting a Pioneer 6X DVD-ROM drive and with audio produced by Diamond's PCI Sonic Impact, the marginal speaker upgrade is the only let-down.

When it comes to piecing its kit together, Armari still tends to plump for older-style cases with six screws to loosen before you can admire the internal handywork. The construction is flawless, with an inspired flair here and there. All cables are unobtrusive, with ample future drive-bay additions assisted by power supply clippings in close proximity. This is not a modular design, so maintenance will take a little time, but the effort will be worth it.



Iiyama's S702GT

shadow mask is compact compared to most 17in monitors. It produces exquisitely bright and warm colours with a fully refresh-supported sharpness right up to impressive resolutions. While it saves space on your desk, it is the display controls that really shine: a few front-mounted buttons take you into graphical-level indicators for efficient user control. You can perfect your display settings within seconds.

PCW DETAILS

MBX-450e Pentium II

Price £1,761.33 (£1,499 ex VAT)

Contact Armari 0181 810 7441

www.armari.com

Good Points Future proofed: dual-processor motherboard.

Bad Points Modest hard disk. Lack of removable storage.

Conclusion Exceptionally well built and powerful machine, but lack of removable storage lets it down.

Build Quality	★★★★★
Performance	★★★★★
Value for Money	★★★★
Overall Rating	★★★★

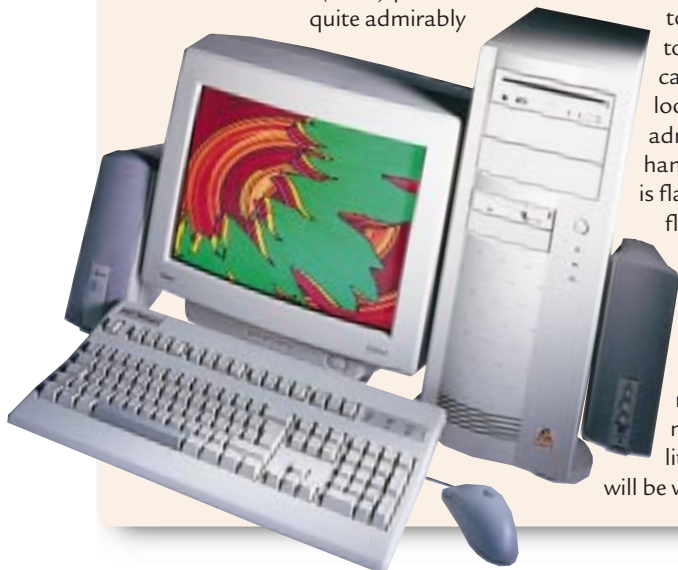
NBX-K500 Pentium III

Good Points Well balanced configuration...

Bad Points ...let down by storage.

Conclusion Optimal graphics workstation, let down by performance.

Build Quality	★★★★★
Performance	★★★
Value for Money	★★★★
Overall Rating	★★★



Dell Dimension V400, Dimension XPS T500

Dell is the largest of the five vendors invited to participate in this month's group test, in all respects. The company boasts 300 technical support staff to complement its premium service options including up to four years on-site maintenance. You'll be buying more than just a computer from Dell, and this, in part, accounts for the more modest on-paper specifications.

The Dimension V400 (*shown, right*) is based around a 400MHz Pentium II processor and, with peripherals such as an on-board local area network adapter, is pitched as an office workstation. The 500MHz Pentium III Dimension XPS T500 (*shown below*) is a far more graphically orientated workstation. Whereas the PII machine has a rather basic on-board AGP version of ATI's 8Mb Rage Pro, the PIII storms ahead, bolstered by its 16Mb STB TNT-based AGP graphics adapter. Performance is on a par with the best here.

For the PII machine, the supporting peripherals start off quite respectably, with some of the extra cash saved on the choice of processor most evidently spent on a decent Hewlett-Packard DeskJet 420C colour printer. Dell was the only vendor to opt for such an inclusion, and it will certainly be of use in any office environment. But the specific environment that we dictated might not warrant this choice over other areas, such as the graphics card and the monitor, that may have needed better attention.

Both machines have reasonable quotas of EIDE hard-disk storage with the PIII machine sporting 14.4Gb over the PII's 12.9Gb. For any large back-

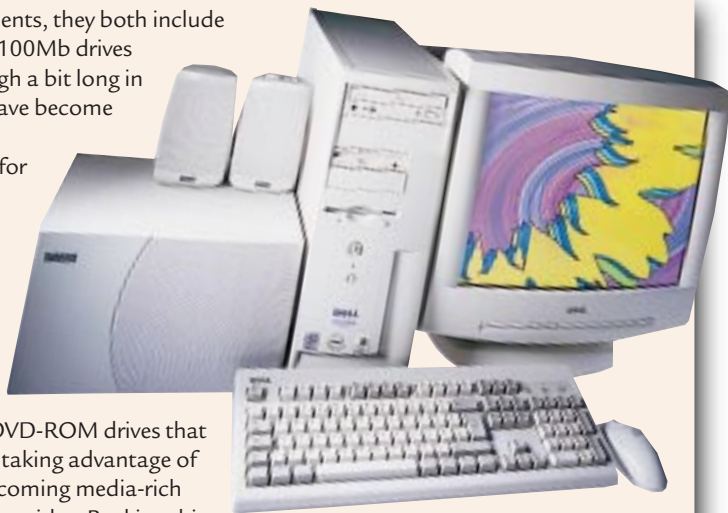
up requirements, they both include lomega Zip 100Mb drives that, although a bit long in the tooth, have become quite widespread for compatible transfers. Both machines' budgets have also managed to squeeze in Toshiba DVD-ROM drives that will soon be taking advantage of the up-and-coming media-rich large reference titles. Backing this up is a decent sound card from Turtle Beach which made it into both machines, but the PIII's money ran out when it came to speakers. Only the PII machine features the rich tones that emanate from the Altec Lansing ACS 295 set-up.

One advantage of buying from a large, respected vendor is evident in the construction of its systems. Both Dell machines are built to exacting standards, with innovative approaches drawn from all areas of the market that Dell has a hand in.

Access to the system boxes is via a simple thumbscrew, with the side-panel easing off gently. Once inside, you immediately eye the impressive but simple ducting placed over the processor, focusing airflow from the chassis fan across the CPU's ample heatsink. Its two-clip arrangement allows for a quick release should any access be required.

Other areas are equally accessible, with pinned back cables revealing space for some upgrading of peripheral cards and bay devices.

Price constraints seem to have been overlooked when it comes to the choice of monitors, with both machines displaying through 19in models. The PIII's D1626 monitor is a Philips 1200HS shadow mask, a fairly standard affair with adequate refresh support as the resolution is increased.



The colour quality is good, with a sharp, non-bloomed representation of the finest details across the whole screen. The Pentium II has the flatscreen CRT P990 monitor, a Sony Trinitron MultiScan 400PS that by virtue of its shape had a marginally better quality display than its counterpart. Both monitors had very similar OSD controls that proved responsive to our requests through the easily navigable consoles.

PCW DETAILS

Dimension V400 Pentium II

Price £1,761.33 (£1,499 ex VAT); plus £1 for PIII machine

Contact Dell 0870 152 4850
www.dell.co.uk

Good Points Air ventilation duct system. Excellent 19in monitor.

Bad Points Lack of spare PCI slots. Very poor performance.

Conclusion Perfect for your general office requirements but lacks bite.

Build Quality	★★★★
Performance	★★
Value for Money	★★★★★
Overall Rating	★★★

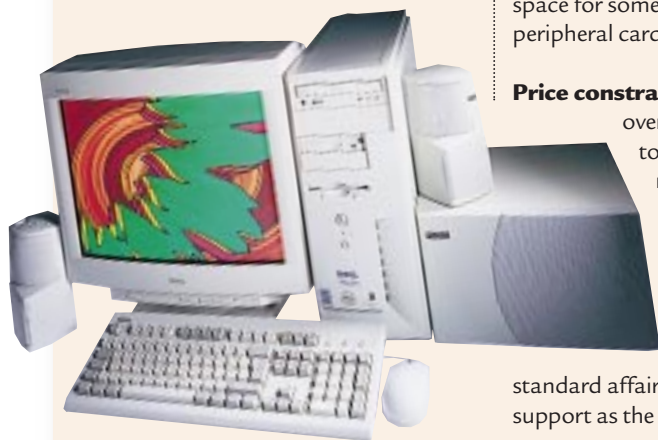
Dimension XPS T500 Pentium III

Good Points 19in monitor squeezed into this budget.

Bad Points Just lacking the venom of its contenders.

Conclusion Very impressive. A good-value package.

Build Quality	★★★★
Performance	★★★★★
Value for Money	★★★★★
Overall Rating	★★★★



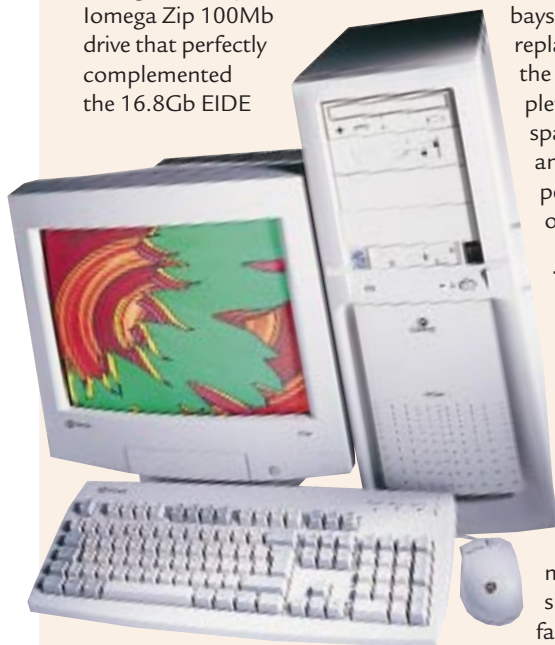
Gateway GP6-400, GP7-500

Founded in 1985, Gateway has grown into a sizeable international player currently addressing the UK market from its manufacturing facilities in Ireland. Years in the business have not left the company with a complacent view of the marketplace however, and we have consistently received eye-opening equipment. For this particular group test we weren't disappointed, as the two systems could not be more different from each other with regard to style and, more importantly, performance.

The desktop-style GP6-400 (shown, right) is built around a 400MHz Pentium II, and would be a clear winner if the criterion for this group test was to provide a desktop space-saving PC. But it wasn't, and the on-board AGP 8Mb ATi Rage Pro graphics subsystem contributed to this system providing the poorest performance results. Even the addition of a 12Mb Voodoo2 graphics accelerator couldn't bolster performance.

The tower-style GP7-500 (shown below) was built around a 500MHz Pentium III with a 16Mb TNT-based AGP graphics card from STB. The Voodoo2 in the system seemed almost redundant, as the primary display card was more than powerful enough to achieve good performance results.

Both machines had removable storage courtesy of the Iomega Zip 100Mb drive that perfectly complemented the 16.8Gb EIDE

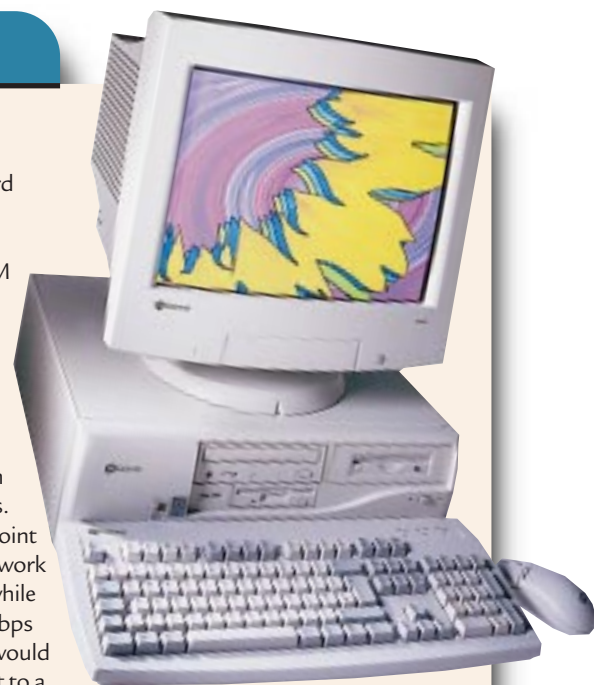


hard disk provided for the PII machine. The PIII machine just scrapes through with a 10Gb hard disk, so the Zip in this case was a real necessity.

A standard 32-speed CD-ROM drive is present in each system, with Creative Labs providing its economy PCI sound card. However, there was enough money in the pot only for the PII machine to pump out the volume through the gloriously rich Boston Acoustics Media Theatre speakers. Another concession to the price point was the lack of any internet or network connectivity in the PIII machine, while the PII managed to provide a 56Kbps GVC Winmodem. Although you would expect any business PC to connect to a Local Area Network or at least to the internet through a modem, this is an area where the end-user's specific circumstances and resources is very difficult to predict, so the exclusion of internet and network connectivity in some cases may be appropriate.

The Goliath-sized case for the Pentium III system is impressive to the point of scary. Expansion is via masses of drive bays and peripheral card slots in its innards, or indeed, have a few friends round to play Boggle inside. It's a beast. The PII machine, on the other hand, is an impressively compact desktop that unfortunately suffers at its own hands. There are no bays available for extra devices, and replacing components is hindered by the reduced access through a plethora of cabling thrusting for space. The board has an impressive amount of slots available for peripheral cards, though, with no obtrusions.

The final angle with which to present an enticing PII package is by spending all available saved cash on the best possible monitor. This obviously was not an option for Gateway, as both machines came with a rebadged 17in EV700 shadow mask monitor from LG Electronics. This monitor was the only one supplied in this group test that failed to support resolutions as



high as 1,600 x 1,200, with poor refresh at lower resolutions. When set at its recommended viewing mode, however, the monitor does stand its own ground, with a sharp, stable image right up to the bezel. Colours were not as bright as those presented by its competitors, but it did have the champion of OSD controls in the form of a one-finger press dial.

PCW DETAILS

GP6-400 Pentium II

Price £1,756.62 (£1,495 ex VAT)

Contact Gateway 0800 552000

www.gateway.com/uk

Good Points Space-saving desktop design. Excellent monitor dial controls.

Bad Points Very poor performance. Constrictive upgrade paths.

Conclusion Poor configuration for the price.

Build Quality	★★★
Performance	★★
Value for Money	★★★
Overall Rating	★★★

GP7-500 Pentium III

Good Points Excellent monitor dial controls. Many upgrade paths.

Bad Points Disappointing KNI-optimised performance.

Conclusion Good system let down by KNI performance.

Build Quality	★★★★★
Performance	★★★★
Value for Money	★★★★
Overall Rating	★★★

Mesh Pegasus 450CDR, Pegasus 500XL



Mesh has a keen eye for selecting components at the forefront of the industry, always striving to provide innovative approaches to its systems. From its beginnings in 1987, the company has grown steadily, accommodating 12 staff in technical support and eight in customer services. With control over its own production facility, Mesh has the perfect opportunity to provide quality kit and back it up with experienced service facilities.

The 450MHz Pentium II machine (shown, right) was supplied under the guise of model name Pegasus 450CDR. Perhaps it should have been called Pegasus 450CDRW because one of the first striking features to jump out from the system box was the fabulous Philips rewritable CD-ROM drive. Able to read all standard forms of CD media, it provides the end-user with the means to supply finished work on a rapid data transfer medium — ideal if the workstation is to be graphically orientated, resulting either in larger files or final CD-ROM products. In addition, this inclusion has not been at the expense of a 40X CD-ROM drive providing direct CD copying facilities. This feature succumbed to the extra premium required for the 500MHz PIII machine.

A 10Gb EIDE hard disk will prove adequate for the PII system as larger backups could easily be carted off on a rewritable CD-ROM. The PIII system, the Pegasus 500XL, (shown, below)

compensates for its lack of removable storage by including a

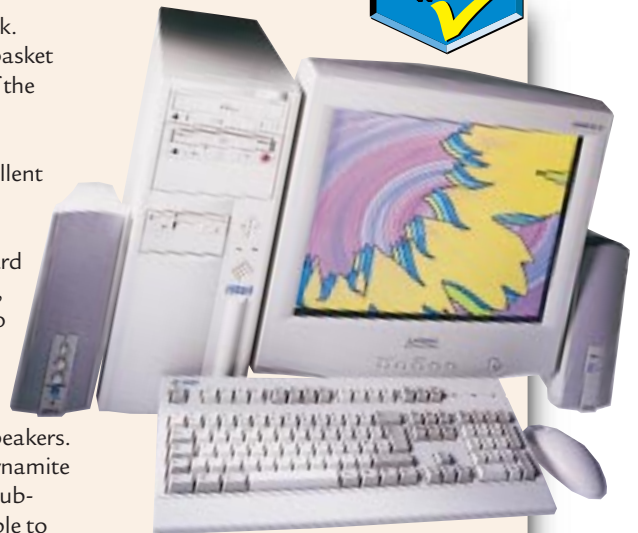
stonking 25Gb EIDE hard disk. Keeping all your eggs in one basket could prove costly, though, if the larger drive failed.

Both systems had the excellent 56Kbps PCI modem from Diamond and the very reasonable PCI 64V sound card from Creative Labs. However, where the PIII machine had to economise with the standard bundled Yamaha speakers, the PII machine sported some excellent Philips USB speakers.

A 16Mb AGP Hercules Dynamite was chosen for the graphics subsystems in both machines. Able to support full 32-bit colour right up to 1,920 x 1,080 resolutions, the nVidia Riva TNT-based card is perfect for graphics work with its bright vibrant colours but only with the full co-operation of its display monitor. This is where a major distinction between the two systems was drawn.

For the PIII machine, a 17in ADI GT56 monitor (which has a Trinitron tube) was provided. Although of a high standard in its own right it had a tough contender in the form of its PII counterpart. Although able to match the refresh rates of the 19in Mitsubishi Diamondtron provided with the PII machine, the sharpness just wasn't apparent at the higher resolutions. The rich colours of the Mitsubishi monitor shamed the ADI and it had the added bonus of its less reflective flat face. The ADI proved to have a more manageable OSD, though.

Construction of both machines was equally impressive, with no obtrusive cabling should you venture into the box for maintenance. If upgrading was your aim then this is open to both systems also with room for extra bay devices and peripheral cards. It must also be pointed out that if your budget dictates choosing the enhanced package afforded to the PII machine you'll still be able to splash out later for a PIII. The most important components are effectively the same, with performance



gains down to the processors. The unoptimised testing showed an increase in performance by the PIII machine in line with its extra 50MHz processor clock speed over its counterpart. Against other vendors' systems the PII machine performed admirably while the PIII machine was out in front. With KNI optimisation, the PIII machine decidedly put its foot down on the accelerator and leapt even further ahead of the competition.

PCW DETAILS

Pegasus 450CDR Pentium II

Price £1,761.33 (£1,1,499 ex VAT)

Contact Mesh 0181 208 4706

www.meshplc.com

Good Points Excellent monitor. Re-writable CD-ROM drive.

Bad Points Left behind when the PIII system put its KNI skates on.

Conclusion An inspired package that oozes quality.

Build Quality	★★★★★
Performance	★★★★★
Value for Money	★★★★★
Overall Rating	★★★★★

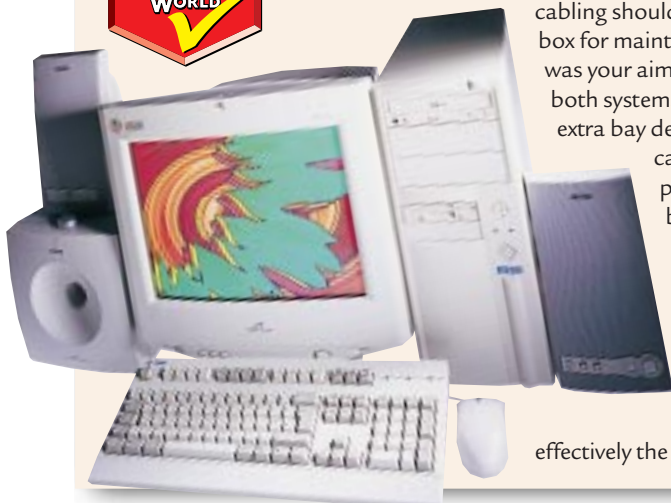
Pegasus 500XL Pentium III

Good Points Massive hard disk. Storming performer.

Bad Points Lack of removable storage.

Conclusion Too beefy to argue with.

Build Quality	★★★★★
Performance	★★★★★
Value for Money	★★★★★
Overall Rating	★★★★★



Viglen C2-450GS, C3-500XS

Viglen is one of the few PC vendors who can claim to have been around since the beginning of the digital age. Since 1975, it has grown to become one of the largest and most successful UK direct PC manufacturers. Based in West London, Viglen currently employs 350 staff, 75 of whom are dedicated-customer technical support staff and engineers. One of the more stylish vendors, Viglen takes the approach that a system is a complete package and subsequently pays attention to every little detail.

The 450MHz Pentium II machine, model C2-450GS (*shown, right*), is clothed in the same sleek casing as its counterpart the 500MHz Pentium III model C3-500XS (*pictured below*). Initial impressions suggest that both systems were built alongside each other, wherever possible duplicating the components until the price forced the PIII machine to finally give up the race. However it comes as a pleasant surprise to discover that the PIII machine only makes minor concessions to its higher processor premium.

Both machines have excellent graphics sub-systems courtesy of STB's 16Mb TNT-based AGP card. And where other vendors have opted for the same basic card, Viglen upped the ante by selecting a TV-out version, thus offering a versatile presentation facility.

Full connectivity is catered for equally by both systems with the inclusion of a 56Kbps PCI modem and a 100Mbps network interface card. And, apart from the monitor, the final identical components are the sound system with Labway's

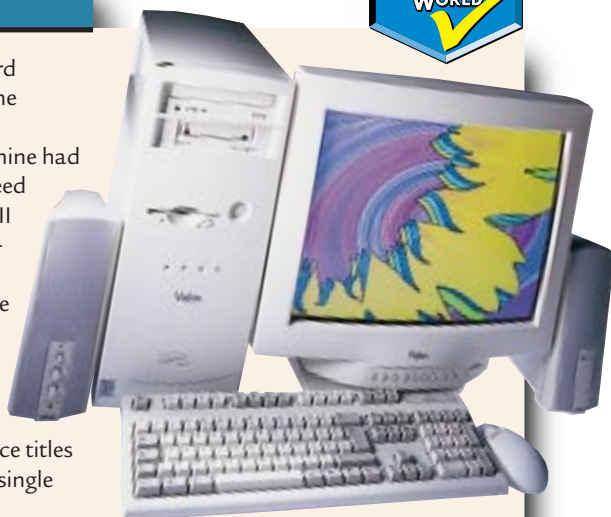
PCI 3D Yamaha XG sound card pounding forlornly through the bundled Yamaha speakers.

At this point, the PIII machine had to concede a standard 32-speed CD-ROM drive whereas the PII machine proudly displays a 4-speed DVD-ROM drive in its top bay. When the DVD movie revolution finally stops overwhelming this versatile medium, the PC industry will begin to lock on to the huge benefits of media-rich reference titles which can be contained on a single DVD ROM disc.

The differences in storage were a tad more harsh, with the PII machine tucking in a healthy 16.9Gb EIDE hard disk and backing this up with a massive 8Gb HP Colorado tape drive. The PIII machine is more reserved with its 12.7Gb hard-disk and adequately caters for removable storage with an LS-120 drive. Much criticism falls on the 120Mb SuperDisk drive for its sluggish data transfers compared to the likes of Iomega's Zip 100 but as it is standard floppy compatible you do save on a bay and it's fine as a personal backup facility.

The case design suggested that your toolkit would be gathering dust as you set to work with just your nimble fingers. However, the plastic bolted side panel refused to come off without the removal of the system's top plate which required the loosening of just one screw. Then, remarkably, the side panel requires sliding downwards, meaning that you would have to tip the system over slightly to facilitate this manoeuvre or dangle your PC over the side of your desk. You're then able to see the fixing more clearly. When returning the panel, the top plate could in fact stay in its position. It was just all a bit stiff.

Once this challenge was over, one of the more innovative case designs was truly marvellous. The drive bays were modular and required the removal of just one screw before they could be levered out for maintenance or upgrading. The remainder of the internal construction was delightfully airy and invitations for hands-on



activities were being cordially issued.

A pleasing feature of both systems was the inclusion of a 19in CTX Invar shadow mask model. It's certainly able to hold its own with the best of the rest, with extremely high refresh-supported resolutions. They even glow with warm colours and a clarity not lost upon highly-detailed characters. The no-nonsense front-mounted buttons provided perfect response to our user-defined settings via a perfectly negotiable OSD.

PCW DETAILS

C2-450GS Pentium II Machine

Price £1,761.33 (£1,499 ex VAT)

Contact Viglen 0181 758 7000

www.viglen.co.uk

Good Points Excellent modular construction. Huge backup device.

Bad Points Case entry is tricky.

Conclusion Well-balanced specification with attention to detail.

Build Quality	★★★★
Performance	★★★★
Value for Money	★★★★★
Overall Rating	★★★★

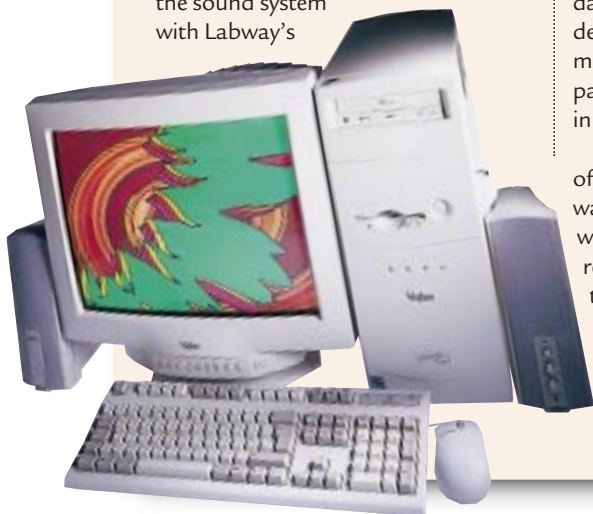
C3-500XS Pentium III Machine

Good Points Good performer. An excellent 19in monitor.

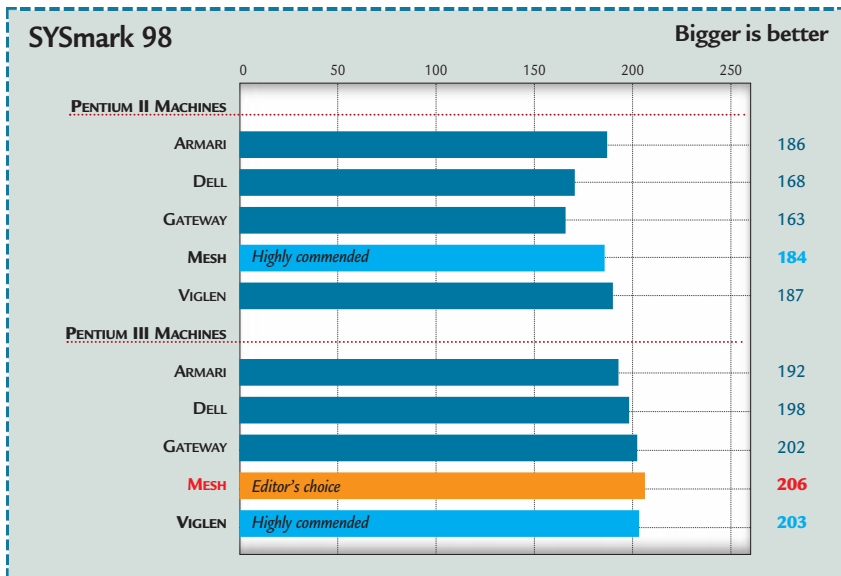
Bad Points Case entry is tricky.

Conclusion The price premium for the PIII is only marginally evident.

Build Quality	★★★★
Performance	★★★★
Value for Money	★★★★★
Overall Rating	★★★★★

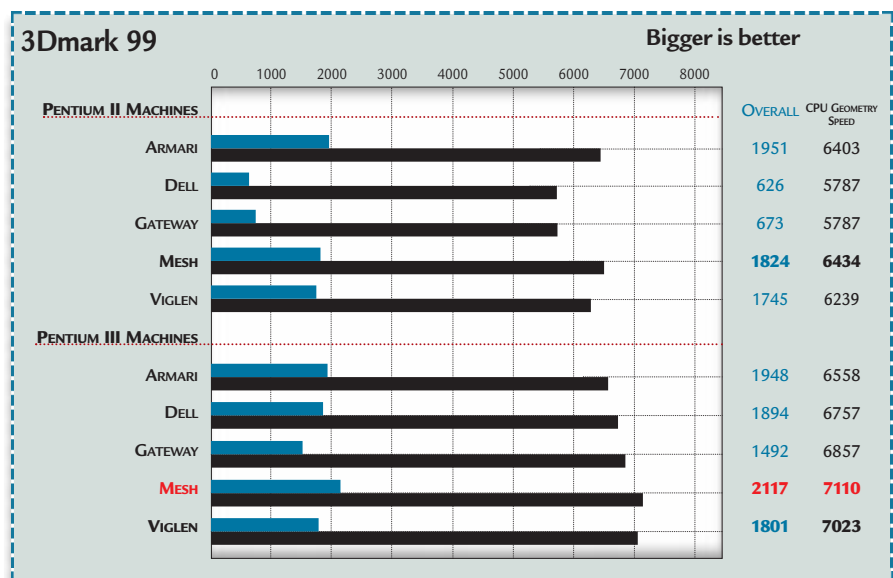


PCW Labs Report



As all the other hardware conditions were fairly constant, all the results seemed to be directly related to the graphics sub-systems adopted by each machine. The low performance of the Pentium II machines offered by Gateway and Dell is mostly as a result of the reduced 8Mb video memory, with a small contribution from the fact that they contained the slowest processors in this group test. For Gateway's part, the inclusion of a Voodoo2-based card did little to help its performance. Of the Pentium III machines, the Armari suffered a low score as a consequence of being the only one not to sport a TNT-based card. While the remaining vendors opted for STB's TNT-based graphics adapter, Mesh preferred Hercules and stood head and shoulders above the rest of the entrants with its storming performance.

The reasons behind these 3Dmark 99 results were similar to those detailed (above) for SYSmark98, although the Voodoo2 3D accelerators included with the two Gateway machines gave them a bit of a boost in this area — less so for Gateway's Pentium III system as the majority of 3D will be dealt with quite adequately by the TNT-based primary display adapter. Although Mesh retained its performance crown for the Pentium III machines, Armari was no longer slouching. The overall 3D performance of ATI's Xpert 128 managed to push Armari up to a respectable second place.



How we did the tests



We ran two sets of tests on the PCs:

➤ **The SYSmark test** measures the speed of the PC running 14 common office and content creation applications and the time it takes to perform a variety of tasks in each application.

Each test is run three times to ensure consistent results. The applications are divided into two categories.

Office productivity: CorelDraw 8, Excel 97, Dragon Systems NaturallySpeaking 2.02, Netscape Communicator 4.05 Standard edition, Caere OmniPage Pro 8.0, Corel Paradox 8, PowerPoint 97 and Word 97.

Content creation: MetaCreations Bryce 2, Avid Elastic Reality 3.1, Macromedia Extreme 3D 2, Photoshop 4.01, Premiere 4.2, and Xing Technology XingMPEG Encoder 2.1.

Performance depends on processor speed, RAM, graphics card and disk I/O.

➤ **3DMark99** from Futuremark Corporation is a suite of tests designed to examine the 3D performance of your PC. Designed by the 3D community, it uses a Real World DirectX6 3D game engine (MAX-FX) from Remedy Entertainment and 3D Realms. It produces one result from a balanced testing methodology which includes image quality, rendering speed and CPU capability. All 3Dmark99 bench tests are performed at a resolution of 1,024 x 768 in 16-bit colour depth with the test suites set to loop three times. The higher the score, the better the result.

➤ **You can get a taster** by downloading 3DMark99 Lite from www.3dmark.com.

KNI results

Instruction sets were in their infancy when Intel introduced MMX to its Pentium-class processors. An extra logic chip with 57 instructions was incorporated into the core architecture to make light work of complex but repetitive processor requests to perform multimedia-related tasks.

The principal of operation takes advantage of the CPU's tendency to process instructions sequentially, repeatedly applying the same instruction to similar data types, via Single Instruction Multiple Data-streams (SIMD).

The 70 Katmai New Instructions (KNI) advances upon MMX with their ability to process more complex floating-point numbers, augment media functions through enhanced integer calculations, and improve data cacheing.

Recognising the significance of improved floating-point performance to geometry calculations was the first step in improving multimedia related performance. However, MMX was using the same registers (or number holding areas) as the floating-point unit of the CPU, causing losses in clock cycles as it switched between the two. Subsequently, Intel's Pentium III has addressed this with the addition of eight 128-bit wide registers to enable KNI and the floating-point units to function in parallel.

Multimedia improvements will be apparent in applications performing

video/audio compression and 3D graphical rendering. Less obvious are those that will benefit through methods of functionality which address the same improved resources. These areas include speech recognition, scientific visualisation through vast maths libraries (finite element analysis is a good example of this) and signal processing for geophysical analysis (for instance, the measurement of seismic activities or atmospheric pressures).

One major hurdle faced by Intel when implementing a new instruction set is to gain the support of the software industry. This is not egotistical but purely a functional relationship, because applications have to be specifically written or modified to take advantage of KNI. The software industry tends to comply quite peacefully, and mostly at its own expense. No company wants to be left out when providing opportunities for its customers to improve upon its existing products.

Known KNI-optimised titles, at the time of writing, included: Adobe PhotoShop, IBM ViaVoice, Activision Battlezone2, Lotus SmartSuite Millennium Edition, Microsoft Office 2000, and Rage's Expendable.

When it came to testing the machines, we began by benchmarking in the traditional manner with 'blind' unoptimised software. These results show no potential performance improvements sported by the Pentium III machines. We would have liked to use some optimised 'real-world' applications such as Adobe's PhotoShop but at the time of testing there was no UK availability — not even for journalists!

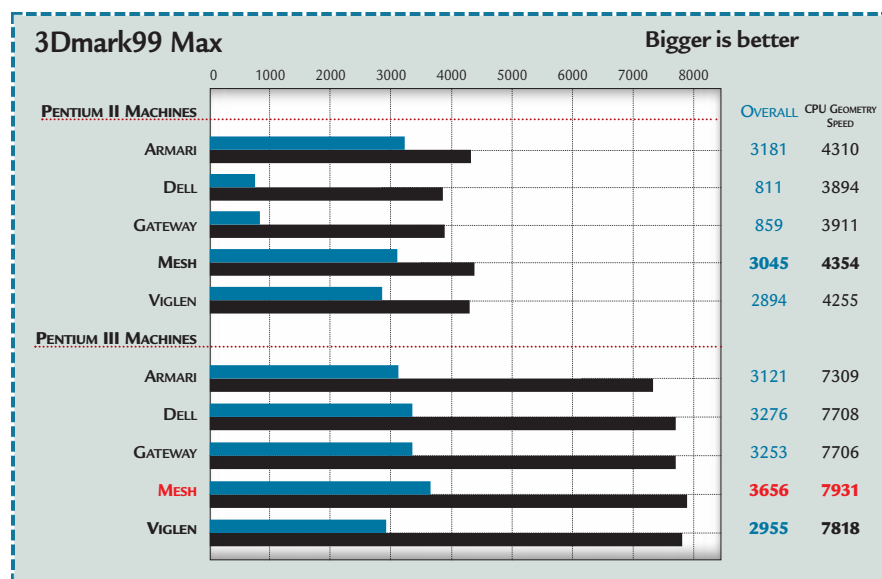
Thankfully, though, FutureMark anticipated the significance of KNI and produced an optimised version of 3DMark99, the Max version. The original

Applications have to be specifically written or modified to take advantage of KNI

3DMark99 suite of tests was also amended to include embossed bump-mapping, a texturing technique that

enhances the visual realism of textures and objects in a 3D environment by giving the illusion of depth variation. Unfortunately, due to the implementation of instruction set optimisation no comparison can be made between the results from the original 3DMark99 and the Max version.

➔ **More details** on 3DMark99 Max and the original un-optimised version can be found at www.3dmark.com along with downloadable lite versions of both.



The comparison between Pentium II and Pentium III PCs with unoptimised benchmarks such as SYSmark98 was disappointing. Performance gains were mostly due to the increased CPU clock frequencies of the PIII machines. The KNI-enabled 3DMark99 Max gave an entirely different picture. Even when the Pentium III machines had to economise on their graphics subsystems, when KNI kicked in the systems kicked butt. Most impressive of all were the results achieved by the Mesh system which had a different flavour of TNT adapter than that favoured by most others. This is evidence of a graphics card manufacturer which had truly spent time and effort to optimise the driver files specific to its hardware.

Memory & performance

It was not long ago that the statement 'minimum system memory requirements' detailed actual bare minimums to perceive full functionality of your chosen application. Memory prices have dropped so far that we are now seeing systems shipped with memory quotas far in excess of what was once regarded as the minimum — it is a welcome result of the economics of mass production. But how far can you take this luxury? How much memory do you need to achieve optimum performance and are there upper limits that would adversely affect performance? The answers will vary, depending on your chosen operating system and/or the application being run at the time.

We asked Microsoft if there were actual limits to fully-supported memory quotas across their operating systems and whether amounts in excess of these limits would incur adverse effects? The

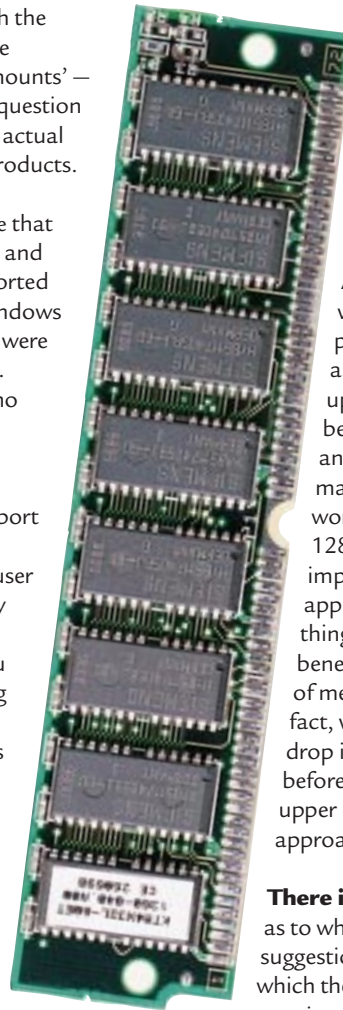
answers were returned with the statement 'Note...these are theoretical MAXIMUM amounts' — possibly a reaction to our question suggesting that there were actual limitations to Microsoft products.

The values returned were that Windows 95 OSR1, OSR2 and Windows 98 all fully supported up to 512Mb and that Windows NT4 service packs 3 and 4 were able to support up to 4Gb. Unfortunately there were no figures quoted for the anticipated versions of Windows 2000, although presumably increased support will be planned.

For the average home user running standard but fairly demanding current office applications or games, you may possibly view anything above 128Mb as a tad excessive. To be fair, unless you're rendering asteroids at film resolution under NT, this is likely to be true.

We ran performance tests under Windows 98 using SYSmark98 (see *How we did the tests*, p144 for workload description) increasing the memory after each run.

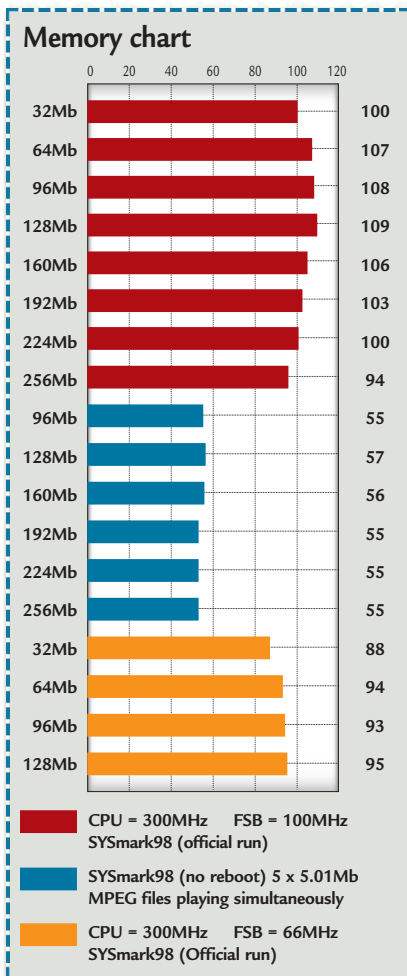
Further to these tests we increased the strain on the system resources by looping five 5Mb MPEG files simultaneously with SYSmark98.



The results were fairly conclusive and supported vendors in their decision to generally supply Windows 98 systems with a maximum of 128Mb system memory. Although under certain workloads the performance increases, as you approach this upper limit the increases become less apparent and the current prices still make any added RAM worthwhile. Above 128Mb, no performance improvements were apparent. Support is one thing but gaining any benefit out of an allocation of memory is another. In fact, we perceived an actual drop in performance well before the Windows 98 upper limit was even approached.

There is no definitive answer as to why these limits exist. As a suggestion, the method by which the operating system perceives memory through

logical mapping may be most efficiently optimised for 128Mb or below and mapping for greater amounts may resource new instructions, dipping the performance slightly as a consequence.



FUTURE MEMORY

Advances in memory technology are just around the corner, with the main focus on the system bus speeds to which the modules will be connected. The first to emerge is likely to be the PC133 standard that, as the name suggests, will up the front-side bus speed support to 133MHz. There have

already been announcements from major core logic manufacturers who will be implementing the technology capable of supporting the increased speeds. Look out for VIA's Apollo Pro133 chipset that will be the first in a generation with fully-integrated functions to smooth the migration

of all connected peripherals to the new standard.

Towards the end of this year, we will see the introduction of AMD's Slot A processor with its Alpha EV6 based bus design likely to push the clocks through the 200MHz barrier. Of course memory will have to follow suit.

Table of features



MANUFACTURER	ARMARI	DELL	GATEWAY	MESH	VIGLEN
MODEL NAME	MBX-450E	DIMENSION V400	GP6-400	PEGASUS 450CDR	C2-450GS
Price (ex VAT)	£1,499	£1,499 ex delivery	£1,495	£1,499	£1,499
Price (inc VAT)	£1,761.33	£1,802.45 incl delivery	£1,756.62	£1,761.33	£1,761.33
Telephone	0181 810 7441	0870 1524850	0800 552000	0181 208 4706	0181 758 7000
Fax	0181 810 8846	01344 723695	00353 1 8482022	0181 208 0966	0181 758 7080
Web address	www.armari.com	www.dell.co.uk	www.gateway.com/uk	www.meshplc.com	www.viglen.co.uk
HARDWARE SPECS					
Processor	Intel 450MHz Pentium II	Intel 400MHz Pentium II	Intel 400MHz Pentium II	Intel 450MHz Pentium II	Intel 450MHz Pentium II
RAM/Type	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM
Occupied / Spare RAM slots	1/3	1/2	1/1	1/2	1/2
Hard Disk	IBM DeskstarGXP	Maxtor Diamondmax	IBM Deskstar	IBM DTTA-371010	Fujitsu MPD3173AT
HD Size/Interface	10.1Gb/EIDE	12.9Gb/EIDE	16.8Gb UDMA	10.1Gb/EIDE	16.9Gb/EIDE
Storage Drive	None supplied	lomega Zip	lomega Zip	Philips PCA362RW	HP Colorado Tape Drive
Size of storage drive media	n/a	100Mb	100Mb	Re-Writable 650Mb CD-ROM	8Gb
Storage drive interface	n/a	EIDE	EIDE	EIDE	EIDE
Motherboard	ASUS P2B-D	Dell/Intel E139761	Intel Tolstoy	ASUS P2B	Viglen 69M
Chipset	Intel 440BX	Intel440BX	Intel440BX	Intel 440BX	Intel 440BX
EXPANSION					
No of 3.5/5.25in bays	4/3	5/2	1/2	4/3	4/3
No of free 3.5/5.25in bays	2/2	2/1	0/0	2/1	2/1
No of PCI/ISA/shared slots	4/2/0	2/1/1	5/1/1	3/2/1	3/2/1
No of free PCI/ISA/shared slots	2/2/0	0/0/1	3/1/1	1/2/1	1/2/0
No of USB/Serial/Parallel/PS2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
MULTIMEDIA					
CD-ROM	ASUS CD-S400	Toshiba SD-M1202 DVD	Mitsumi FX320s	Mida LTN-382	Hitachi GD-2500
CD-ROM Speed/Interface	40x/EIDE	4.8xDVD/ATAPI	32x/EIDE	40x/EIDE	4xDVD/24xCD/EIDE
Sound card	Creative Labs SB 64V PCI	Turtle Beach Montego II	Creative Labs Audio PCI 64D	Creative Labs PCI 64V	Labway PCI 3D Yamaha XG
Speakers	Yamaha YST-M8	Altec Lansing ACS 295	Boston Acoustics Media Theatre	Yamaha YST-M20DSP	Yamaha YST-M15
Graphics card	ATI Rage Fury	ATI Rage Pro	STB Velocity 128	Hercules TNT Dynamite	STB Vel. 4400 TNT w/TV-out
RAM/Max RAM and type	32Mb/32Mb/SDRAM	8Mb/8Mb/SDRAM	8Mb / 8Mb SGRAM	16Mb/16Mb/SDRAM	16Mb/16Mb/SDRAM
Graphics card interface	AGP	On-board AGP	On-board AGP	AGP	AGP
Monitor	Iiyama S702GT	Sony Ultrascan P990	LG EV700	Mitsubishi Diamond Pro 900u	CTX 19D
Monitor size/Max viewable diag	17in/15.7in	19in/18in	17in/15.9in	19in/18in	19in/18in
Max refresh rate at 1,024 x 768	100Hz	85Hz	85Hz	100Hz	100Hz
Max refresh rate at 1,280 x 1,024	85Hz	85Hz	60Hz	85Hz	85Hz
Max refresh rate at 1,600 x 1,200	75Hz	60Hz	n/a	75Hz	75Hz
OTHER INFORMATION					
Modem	Diamond SupraExpress 56I Pro PCI	USR V.90 Global	GVC Winmodem	Diamond SupraExpress 56I Pro PCI	CIS PCI
Highest supported standard	56K ITU (V.90) + K56 flex	V.90	56K ITU (V.90) + K56 flex	56K ITU (V.90) + K56 flex	56K ITU (V.90) + K56 flex
Misc Hardware	n/a	Intel 82558 Fast Ethernet on-board, HP Deskjet 420C Printer	STB Black Magic Voodoo2 12Mb	n/a	Intel Pro LAN Card 100Mbps
Bundled software		MS Office SBE 97 v2.0	MS Essentials for Business, Business Showcase	Lotus SmartSuite Millenium	MS Office SBE 97 v2.0 STB/Quadrant DVD Player
Sales and Support:					
Standard Warranty	1 yr RTB	3 yrs (yr 1 on-site)	1st yr on-site, next 2 yrs RTB	Yr 1 on-site, next 2 yrs RTB lab.	1 year collect and return
Warranty Options	3 yrs on-site	up to 4 yrs on-site	3yrs onsite @ £149 (ex VAT)	up to 5 yrs on-site	Up to 4-hr response OSM

Table of features



MANUFACTURER	ARMARI	DELL	GATEWAY	MESH	VIGLEN
MODEL NAME	NBX-K500	DIMENSION XPS T500	GP7-500	PEGASUS 500XL	C3-500XS
Price (ex VAT)	£1,499	£1,500 ex delivery	£1,538	£1,499	£1,499
Price (inc VAT)	£1,761.33	£1,803.62 incl delivery	£1,807.15	£1,761.33	£1,761.33
Telephone	0181 810 7441	0870 1524850	0800 552000	0181 208 4706	0181 758 7000
Fax	0181 810 8846	01344 723695	00353 1 8482022	0181 208 0966	0181 758 7080
Web address	www.armari.com	www.dell.co.uk	www.gateway.com/uk	www.meshplc.com	www.viglen.co.uk
HARDWARE SPECS					
Processor	Intel 500MHz Pentium III	Intel 500MHz Pentium III	Intel 500MHz Pentium III	Intel 500MHz Pentium III	Intel 500MHz Pentium III
RAM/Type	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM	128Mb/PC100 SDRAM
Occupied / Spare RAM slots	1/2	1/2	1/2	1/2	1/2
Hard Disk	IBM DeskstarGXP	IBM Deskstar	Quantum Fireball	IBM DJNA-352500	Western Digital Caviar 313000
HD Size/Interface	10.1Gb/EIDE	14.4Gb/EIDE	10Gb/EIDE	25Gb/EIDE	12.7Gb/EIDE
Storage Drive	None supplied	lomega Zip	lomega Zip	None supplied	Matsushita LS-120 ver 4 07
Size of storage drive media	n/a	100Mb	100Mb	n/a	120Mb
Storage drive interface	n/a	EIDE	EIDE	n/a	EIDE
Motherboard	SuperMicro P6-SBA	Dell/Intel E139761	Intel Tabor II	ASUS P2B	Viglen 69M
Chipset	Intel 440BX	Intel440BX	Intel440BX	Intel440BX	Intel 440BX
EXPANSION					
No of 3.5/5.25in bays	4/3	5/2	6/4	4/3	4/3
No of free 3.5/5.25in bays	2/2	2/1	4/2	2/2	2/2
No of PCI/ISA/shared slots	2/3/1	4/0/1	5/1/1	3/2/1	3/2/1
No of free PCI/ISA/shared slots	1/2/1	2/0/1	3/1/1	1/2/1	1/1/0
No of USB/Serial/Parallel/PS2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
MULTIMEDIA					
CD-ROM	Pioneer DVD-103	Toshiba SD-M1202 DVD	Mitsumi FX320s	Mida LTN-382	Samsung SCR3231
CD-ROM Speed/Interface	6xDVD/32xCD/EIDE	4.8x DVD / ATAPI	32x/EIDE	40x/EIDE	32x/EIDE
Sound card	Diamond Sonic Impact S90 (PCI)	Turtle Beach Montego II	Creative Labs Audio PCI 64D	Creative Labs PCI 64V	Labway PCI 3D Yamaha XG
Speakers	Yamaha YST-M20DSP	None supplied	None supplied	Philips DSS350 USB	Yamaha YST-M15
Graphics card	ATI Xpert 128	STB Velocity 4400	STB Velocity 4400	Hercules TNT Dynamite	STB Velocity 4400 TNT w/TV-out
RAM/Max RAM and type	16Mb/16Mb/SDRAM	16Mb/16Mb SGRAM	16Mb/16Mb SGRAM	16Mb/16Mb/SDRAM	16Mb/16Mb/SDRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP
Monitor	Iiyama S702GT	Philips 1200HS	LG EV700	ADI GT56	CTX 19D
Monitor size/Max viewable diag	17in/15.7in	19in/18in	17in/15.7in	17in/15.8in	19in/18in
Max refresh rate at 1,024 x 768	100Hz	85Hz	85Hz	100Hz	100Hz
Max refresh rate at 1,280 x 1,024	85Hz	85Hz	60Hz	85Hz	85Hz
Max refresh rate at 1,600 x 1,200	75Hz	75Hz	n/a	75Hz	75Hz
OTHER INFORMATION					
Modem	Diamond SupraExpress 561 Pro PCI	USR V.90 Global	None supplied	Diamond SupraExpress 561 Pro PCI	CIS PCI
Highest supported standard	56K ITU (V.90) + K56 flex	V.90	n/a	56K ITU (V.90) + K56 flex	56K ITU (V.90) + K56 flex
Misc Hardware	n/a		STB Black Magic Voodoo2 12Mb		Intel Pro LAN Card 100Mbps
Bundled software		MS Office SBE 97 v2.0	MS Office97 SBE v2.0, Business Showcase	Lotus SmartSuite Millenium	MS Office SBE 97 v2.0 Cheyenne Bitware
Sales and Support:					
Standard Warranty	1 yr RTB	3 yrs (yr 1 on-site)	1st yr on-site, next 2yrs RTB	Yr 1 on-site, next 2 yrs RTB lab.	1 yr collect and return
Warranty Options	3 yrs on-site	up to 4 yrs on-site	3yrs onsite @ £149 (ex VAT)	up to 5 yrs on-site	Up to 4hr response OSM

Editor's Choice

When it came to dishing out the awards, a number of issues were considered beyond the basic specifications and performance results. Each of the vendors is asking around £1,499 (ex VAT) for their systems – no small amount of money – so, along with good quality construction you would expect to receive good quality service. But this is less easy to judge, so we have tried to offer you some insight on this occasion so that you can draw your own opinions based on our views and the facts before you.

Reasons for choosing a system built around a Pentium III will obviously be dependent on you receiving any real benefits from the Katmai New Instructions. The processor alone provides very little in the way of improved performance over its predecessor so you must research the applications you will be running to ensure that they will be optimised for KNI.

Of course, the now-budget Pentium II systems can offer you a more complete package so you may be tempted to invest initially in a Pentium II before you venture into upgrading the machine yourself to a Pentium III standard.



➤ **The criteria of this group test** did stipulate that a serious business user would need to be

Exceptional performance from a quality package

catered for but we also emphasised that a focus on graphics, and particularly 3D images, would also be considered.

For this reason our **Editor's Choice** for the overall best possible machine goes to **Mesh's Pentium III-based Pegasus 500XL** (shown, right). It did lack any removable storage device but it had a huge

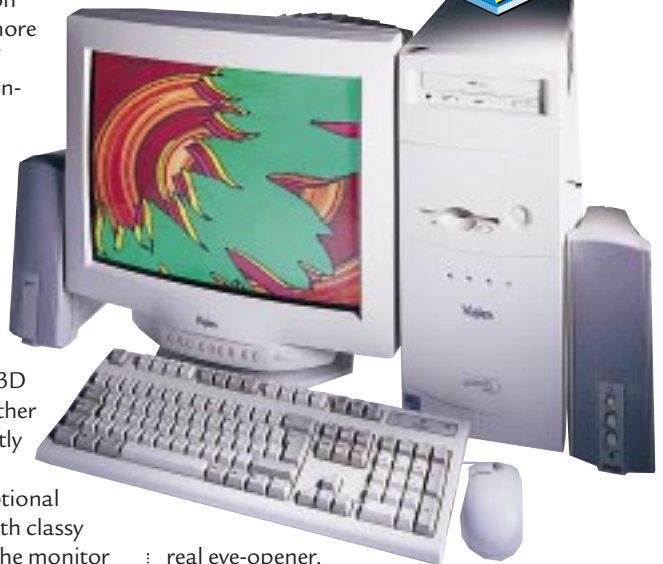
hard disk. The ADI 56GT monitor was not as impressive as the Mitsubishi Diamond Pro 900u on offer with Mesh's Pentium II counterpart, but to be fair the ADI monitor is in fact perfectly acceptable, it's just that by comparison the monitor provided with Mesh's Pentium II machine is just stunning. The main criteria have been excelled in all other areas with exceptional performance from a quality package. The only suggestion would be to fork out a bit more cash and take advantage of Mesh's optional five years on-site maintenance.

➤ **Viglen's Pentium III-based C3-500XS** (pictured, right) picks up our first **Highly Commended** award. Although it stumbles slightly with its specific 3D results, all the other areas are perfectly balanced in providing exceptional build quality with classy components. The monitor alone is enough to make this product stand out from its competitors and for this reason alone its Pentium II machine is worth a look.

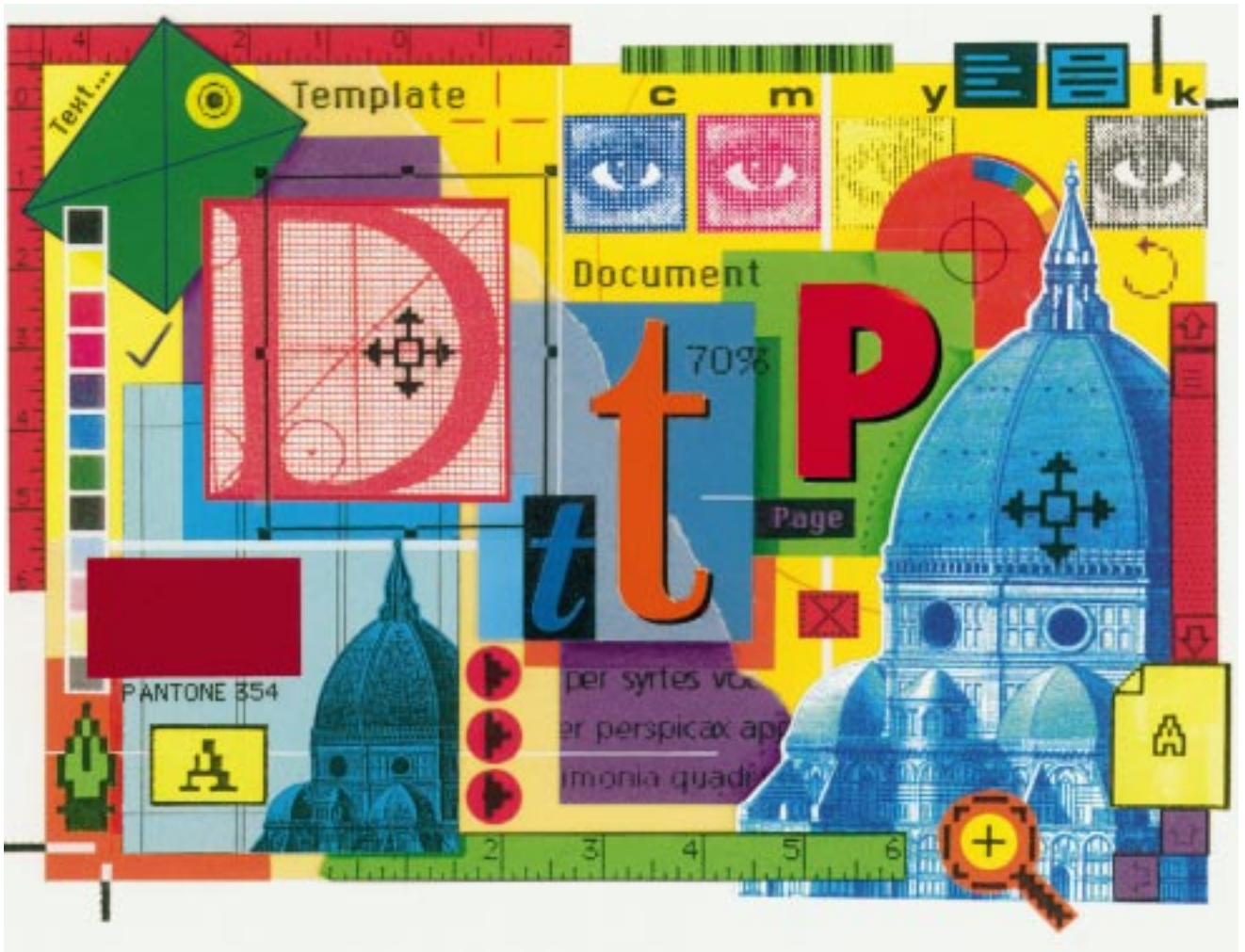
➤ **There will be smiles** all round at Mesh. We were particularly impressed by the **Mesh Pentium II-based Pegasus 450CDR** (pictured below, left) which receives our second **Highly Commended** award. As previously mentioned, the impressive quality of the Mitsubishi 19in monitor provided was a



real eye-opener. The end user would also derive benefit from the added kudos of being able to use re-writable CD media as a backup medium, or for presenting finished work to their clients.



Desk top gear



Which **DTP package** is best for your needs? Ken McMahon assesses a range of software for professional and home use.

Illustration by Paul Bateman

The world of desktop publishing has polarised and software vendors are concentrating their efforts on capturing two key markets: the professional publishing industry and the small and home office, or domestic, user.

Professional DTP for the most part involves the production of commercial magazines. The kind of tools required to produce *GQ*, or *PCW*, are very different from what you need to put together the quarterly newsletter of the PTA or local Labour Party. Precise typographic control, trapping, foreign language spell checking, version control and automatic

indexing are valuable tools for professional publishers. But those of us producing occasional four-page publications are more in need of an unimposing workspace, easy-to-use intuitive tools and some design guidance.

Accordingly, in this group test, we first look at those packages designed for professional work and rate their suitability for a typical job — magazine production. In the second part, we take a look at what are often called 'budget packages' and assess them for a typical home user task — the production of a four-page newsletter.

Contents

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- 155** Adobe InDesign
- 155** QuarkXPress 4.04
- 156** Corel Ventura 8.0
- 158** Newsletter production
- 158** Microsoft Publisher 98
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Magazine publishing

Producing magazines is a high-pressure, deadline-sensitive business. Publishers look for software that simplifies the process of getting the words and pictures onto the page and which can undertake time-consuming reprographic tasks, such as the production of film separations.

Designers are more interested in the creative possibilities opened up by new technologies. Special text and photo effects which now define the way many publications look would have been impossible to achieve as few as two or three years ago.

Most packages have gone as far as they can with the basic functions of magazine production and latest developments have tended to focus on introducing features which previously had to be carried out in Draw or image editing applications. This not only makes the production of creative content simpler but not having to switch between packages simplifies and speeds up the workflow, making deadlines more manageable, reducing production costs and increasing profits.



Adobe InDesign

The release of Adobe InDesign marks the beginning of a big shake-up in commercial publishing. Currently, Quark XPress is king of the hill but InDesign has come along and now looks set to topple that reign.

Beta copies are not yet available for full review, but PCW was given a demonstration and it looks as if Adobe's product outclasses Quark's in almost every respect. It looks, feels and works just like Adobe's two industry-leading design tools, Photoshop and Illustrator. A keyboard shortcut editor lets you

modify the default settings and smoothes the transition from Quark.

InDesign ships with Quark-compatible shortcuts so you can open XPress files (versions 3.3 to 4.0) and retain all the formatting. Adobe claims InDesign protects text attributes where possible and maintains colour management settings. How successful this is in practice remains to be seen. Inevitably, there will be a certain amount of tidying necessary, especially with Xtension-heavy versions.

You can import native Illustrator, Photoshop and pdf files. Illustrator files remain editable, so it will no longer be necessary to switch back and forth between packages to carry out minor editing of graphics. But production managers are going to have to think carefully about the implications of this kind of tampering.

InDesign text and graphics are frame based but there's little of the constraint you would expect from dealing with elements in boxed containers. Any object can be a frame: rectangles, ovals, hand drawn shapes and converted text. You can paste frames within frames to create nested objects, each of which is editable.

InDesign's architecture is modular and extensible. Essentially, it's all plug-ins, so features can be added without waiting for an upgrade. Functionality can be simultaneously developed for all products and, as a consequence, InDesign offers a respectable subset of Illustrator's Bezier features. The pen tool can be used to create new artwork or modify Illustrator artwork and the scissors tool used to split paths. You can create compound paths with transparent holes, convert text to paths and use it as a frame for pictures, graphics or text.

The layers palette works exactly as Illustrator and Photoshop's so you can turn layers on and off, re-order, lock, colour code and print or suppress them. InDesign recognises clipping paths in Photoshop eps files and converts them to an editable frame. Alternatively you can create an InDesign clipping path from scratch.

If Quark introduced precise typographic control to desktop publishing, InDesign takes it to new

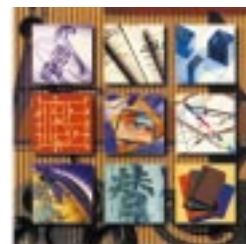
levels. Most values can be specified to a one thousandth of a unit and positioning is accurate to a millionth of a point. Minimum page size is one pica square and the maximum is 18sq ft. With spreads up to ten pages wide, this makes InDesign good for everything from postage stamps to banners.

You'll probably need to make plenty of use of the five to 4,000 percent zoom and customisable view thresholds. This allows you to define what appears at specific screen magnifications, so you could make the baseline grid appear only at actual size or bigger, rather than at smaller magnifications when it can become distracting.

InDesign's multi-line composition engine delivers big improvements on the kind of word and character spacing we've been used to. The multi-line composer considers several lines at once when deciding where to break lines in order to achieve the best visual result and produces more evenly balanced lines with no ugly spaces or breaks.

For those used to printing PostScript files and distilling them as a means of electronic proofing, InDesign will do all this directly.

Quark XPress 4.04

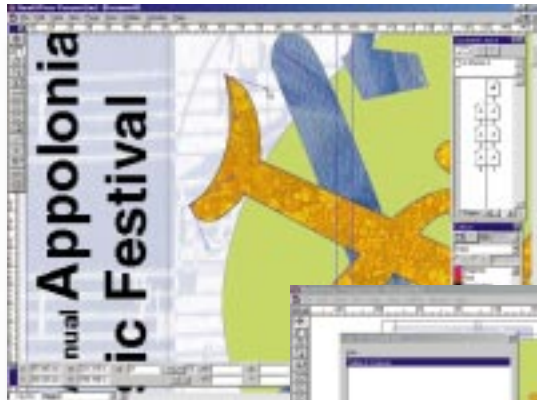


QuarkXPress



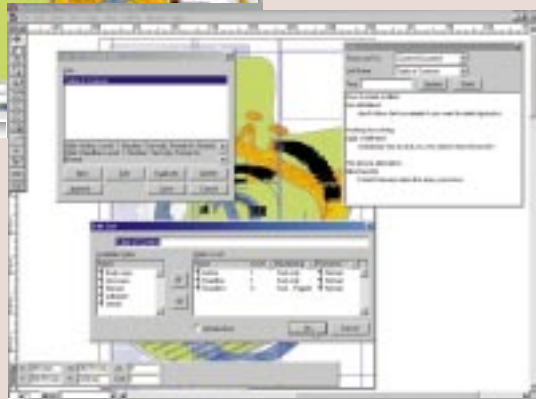
For magazine production, XPress is the

package you use because it has consistently delivered the kind of features, control and flexibility that the job requires. From precision typography to colour reproduction, XPress provides more control than its competitors. Where other packages gave you 'loose' and 'tight' tracking, XPress provided tracking and pair kerning in one thousandth em increments. Others let you place colour pictures on the page but XPress lets you specify screen frequency and angles.



◀ **XPRESS 4.0'S BÉZIER FEATURES OFTEN SAVE YOU THE BOTHER OF USING A VECTOR DRAWING PACKAGE. NODE EDITING OF PICTURE BOXES IS CARRIED OUT USING THE MOVE TOOL**

▶ **PRODUCING A TABLE OF CONTENTS USING A LIST COMPRISING ARTICLE HEADLINES, AUTHOR AND STANDFIRST STYLE SHEETS. XPRESS' EDIT LIST LETS YOU ASSIGN PAGE NUMBERS, INDENTS AND STYLE FOR THE TOC ENTRY**



Of course, if XPress does not do what you want, there is a multitude of third-party plug-ins or Xtensions that most likely will. The Xtensions provide additional features, from imposition managers, which produce multi-page layouts in the precise format required for commercial printing, to special effects filters providing drop shadows and other text effects.

The package has changed little in the past two years but version 4.0's big thing is Bézier curves. Previously the preserve of vector illustration packages, they have been introduced into just about every aspect of XPress' functioning.

Bézier features are accessed via pop-out additions to the toolbox. The textbox tool now has six variations, including two Bézier tools: a freehand drag and draw tool and a conventional point-and-click Bézier pen tool. You get the same Bézier options for the picture box tool and there's an all-new line text path tool with which you can create curved paths along which text can flow.

The introduction of Bézier curves makes for greater flexibility. You can convert freely between text and picture boxes, convert display type to Bézier boxes and use Boolean operations to combine and create new objects from existing ones. It is a straightforward operation, for instance, to create letter-shaped picture boxes using the text to box command. Individual letters or entire words can be made to accommodate single images.

Automatic creation of clipping paths is yet another application of the Bézier function. Of course, the path is application-specific rather than image-specific but it's a lifesaver for quick cut-outs.

Support for large documents has been introduced, including indexing and table of contents generation, but XPress could benefit from more flexible master page options along the lines of Ventura's. And the ability to define baseline grids on a master page, rather than document-wide basis would also be helpful.

Corel Ventura 8.0



Since Corel acquired Ventura in 1993 it has undergone several revisions to integrate it with other Corel

applications, to add the kinds of features found in more mainstream layout packages and to shake off the 'specialist long document' moniker, although this is still seen to be Ventura's main strength.

Version 8 benefits from the introduction of Dockable palettes, or Dockers for the Navigator and Tag window, which makes for a more manageable workspace.

Although ease of use isn't high on the list of Ventura's features, its tag system of

applying style attributes to everything from text to rules must rate as one of the easiest, most direct and consistent methods around. Tags can be applied to pages, paragraphs, frames, characters and rules. Page tags replace version 7's master pages, so once tags have been defined you can drag and drop them from the tags palette onto their target.

Page tags offer flexible control over master page items. The page tag properties dialogue allows you to independently set columns for the left and right master pages and the columns needn't all be the same width. 'So what?' you may think but often a magazine layout requires a narrow outer column for pictures, pull quotes or just white space, and two equal inner columns. Ventura lets you define individual column and gutter widths as well as inter-column rules. You can enter the details numerically, or drag the gutters into position, or there are a number of presets from which to choose.



▲ **VENTURA'S PAGE PROPERTIES ALLOW FLEXIBLE INDEPENDENT ADJUSTMENT OF PAGE GUIDES FOR LEFT AND RIGHT PAGES, DIFFERENT COLUMN WIDTHS AND RULE STYLES**

Setting up a baseline grid proved a bit tortuous. Unlike Quark's baseline grid, which can be used to ensure that text locks to a horizontal grid and is aligned across columns, Ventura offers a horizontal and vertical grid system which apparently has no typographical purpose. You can align virtually anything to it apart from lines of type.

As you would expect for a book publishing application, there's good support for importing lots of text into a predefined layout and you can determine how Ventura flows-in copy and how it runs around pictures. Ventura also supports embedding paragraph style 'tags' in copy. Sub editors denote text style by preceding it with the paragraph style and Ventura automatically assigns the correct style when text is imported.

Newsletter production

Our three 'Newsletter' applications here all cost less than £100. But while price is obviously important, recent developments have encompassed suitability and ease of use. You might find some of the features present in the professional packages, such as precision typesetting, support for colour separation, style sheets, colour libraries and so on, but they are often tucked away. Up front, you'll find plenty of help and step-by-step guidance through a range of home publishing projects from party invitations to small newsletters.

Three things are necessary for this approach to succeed. Firstly, the wizard (MS and Serif favour wizards, GSP prefers pilots) must offer the user an intelligent set of questions that expands the options available from the starting template selection. Secondly, once the guidance stops, it should carry on — not leave you high and dry with a pretty-looking template and no idea what to do with it.

Thirdly, the tools should be there to knock your publication into shape using your own content without having to resort to the manual every five minutes and risking the user giving up in frustration.

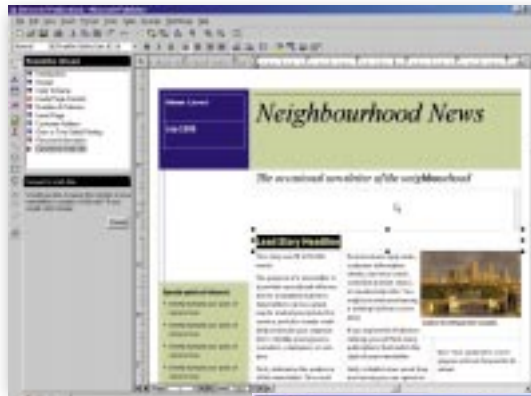
Microsoft Publisher 98



Publisher kicks off with a tabbed palette from which you can choose to start a wizard,

pick a template, open a pre-formatted (but blank) publication, or view existing ones. There are 28 newsletters from which to choose and all, judging by the thumbnails, are quite acceptable.

The nice thing about Microsoft's wizards is that unlike Serif's they reside in a panel at the side of the screen so you can see what you're doing while you are benefiting from the wizard's advice. They



▲ **PUBLISHER 98'S WIZARD PANEL ALLOWS YOU TO GO BACK AND CHANGE ANYTHING AT ANY TIME AND GUIDES YOU THROUGH OTHER ACTIVITIES SUCH AS CONVERTING PAGES FOR THE WEB**

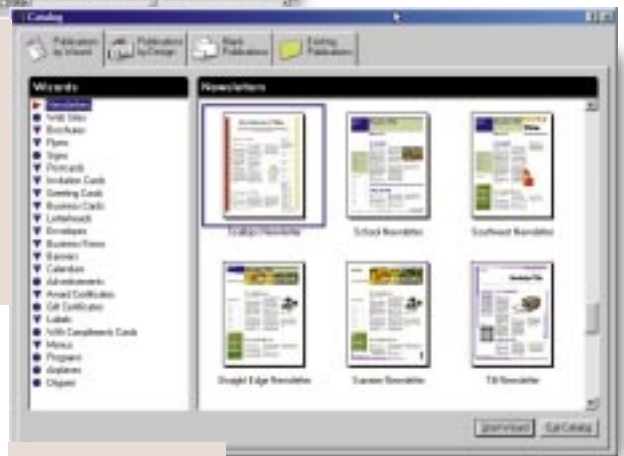
also provide plenty of ancillary information so it feels more like a tutorial than merely a form-filling exercise.

First you choose a colour scheme — a palette on which all the colours and tints in the document are based. Next, choose a one-, two-, or three-column grid and preview the result before confirming. Decide whether you want company details on the back page and single- or double-sided printing. When you've finished, each stage in the process is displayed in the top half of the wizard window so you can go back and change it at any time. Clicking on the relevant stage redisplay the options in the bottom half of the pane. And, if you no longer need the wizard, a toggle button makes the panel disappear, freeing-up valuable screen space for the edit window.

A unique feature of Publisher, and one that's so good it's surprising it hasn't been reproduced in rival packages, is the group button. When you shift-click to select multiple objects a group button appears below the multiple selection and

you just click on it to group the objects. When you select a group, clicking the same button ungroups everything.

Importing pictures and text to replace the template holders is quick and easy. Double clicking on pictures launches the clipart Gallery 4.0 — a tabbed palette which provides access to



▲ **PUBLISHER 98 WIZARDS PRODUCE WELL-DESIGNED COLOUR CO-ORDINATED TEMPLATES WITH EVERYTHING YOU NEED ALREADY IN POSITION**

lots of stuff categorised by media type and content. First you select from clipart, images, sounds and motion clips (these last two options are only applicable to internet publication) then select from a wide range of subject categories including everything from academia and animals, to web backgrounds, banners buttons, banners and dividers.

The combination of well designed templates and intelligent wizards means that there's much less work to do than with either of the other budget packages. Our front page included a lead story with captioned picture, secondary story, points of interest tinted panel box and a 'what's inside' contents panel. The inside pages were displayed as a spread with three stories per page, captioned pictures and pull quotes positioned in an outside margin. All of this made for a very pleasing, uncluttered and well-balanced layout with plenty of white space. The domestic user will be able to produce a polished publication, quite simply.

GSP Power Publisher



Since our previous DTP group test, GSP Pressworks 2.5 has undergone a major revision and

Pressworks 3 is now part of the Power Publisher suite which includes Designworks 3.5, a photo editor and 20,000 image library.

GSP has done an excellent job of improving the interface and providing guidance for specific projects and the result is that beginners will be able to spend more time thinking about what they are going to produce rather than how they are going to achieve it.

In keeping with the current trend for guided projects, Pressworks has 13 PagePilots (what Microsoft calls wizards) which provide personalised templates on the basis of answers to a number of questions regarding content. Typically, you can firstly choose from a variety of style templates and then add personal details before finalising the design. There is a good range of useful templates, including Avery labels, home and office documents. A context-sensitive help assistant window gives additional advice about the task in hand.

There is a choice of four newsletter template styles. Having selected one, the PagePilot takes you through the process of choosing colour schemes, headline and body fonts and graphics frames.

Users of Pressworks 2.5 will raise a cheer at the scrapping of work modes. To edit text you had to be in text mode and if you then wanted to change frame properties you first had to switch to frame mode. Suffice to say, no one will lament its passing. Not only can you now switch tasks without having to switch mode but frames themselves are modeless and can contain pictures, text, tables or all three. The range of frame shapes has also been expanded, from the purely rectangular, to include rounded boxes, ellipses and stars, all of which may be manually edited to produce any customised shape you want, although the process involves a lot of point dragging.

The powertext special text effects editor has undergone major surgery, with



▲ **GSP POWER PUBLISHER'S PAGEPILOTS, ALTHOUGH NOT AS VERSATILE AS PUBLISHER 98'S WIZARDS, OFFER PLENTY OF SCOPE FOR VARIED LAYOUTS**

new controls and a bigger preview window. There are more than 40 editable effects including drop shadows, outline and fill style. The new 3-D powertext effect allows you to add depth, alter the viewing angle and adjust the colour and position of lighting controls, and includes a library of presets.

Serif PagePlus



You could call Page Plus 5.0 the budget application with professional aspirations. At £99 the professional

edition includes support for spot and process colour separations, trapping and table and logo applications. For the novice newsletter designer there are 300 templates which can be used conventionally, or as the starting point for producing a wizard-guided publication. Additional material includes 17,500 pieces of clipart, a reasonable clipart browser with which to view them, and 400 fonts.

When starting PagePlus you are given the option of using a page wizard or going it alone, although the wizard process is a little perfunctory. Choosing one of the newsletter templates you are asked to enter the publication's title and your name and the issue number. These details are then substituted into the template. You get four pages of

layout into which you can substitute your own words and pictures— although the templates and wizards seem somewhat 'knocked together'.

It would have been useful to have the option to specify facing pages and choose a colour scheme, headline and body copy fonts. Initially, we were pleased to see that the wizard had created a four-page template for our newsletter, but were later disappointed to discover that each page had exactly the same, poor layout. The 300 templates include a

good selection of newsletters and other materials for clubs, schools and the like, but little usable business material.

Things improve once you get to the document. The interface provides all the information you need to perform the layout basics. The top toolbar is context-sensitive and a status window and hint panels give further clues to the function of the various buttons. PagePlus has good facilities for linking text frames.

Importing pictures is a simple wizard-driven process and the clipart browser allows you to drag-and-drop artwork directly onto the page. One excellent feature is the logo designer applet, Logo Plus, which provides all the tools you need to create logo artwork. It uses tabbed layers to build up a design with



▲ **SERIF'S CONTEXT-SENSITIVE CHANGE BAR LETS YOU ADJUST VALUES NUMERICALLY OR BY USING SLIDERS**

an extensive collection of versatile shape-forming tools and a library of top-notch text effects.

Another plus is what you might call post production checking facilities, which include wizards for spellchecking, proof-reading and layout checking.

Electronic Publishing

Every package we've looked at, without exception, provides a means of producing electronic publications.

There are three approaches.

The easiest, and often least satisfactory, involves converting a paper publication to HTML via an export filter.

Alternatively, you tell the software at the outset that you want to create web, not paper, pages and it provides the appropriate page format and tools. The page is exported to HTML using a filter but given the appropriate design format and inclusion of web-specific features, the chances of success are greatly increased.

Then there is the portable electronic document, where pages originally intended for printing are converted into a proprietary file format which maintains all their layout formatting and can be viewed on any platform using free viewing software. Adobe's Acrobat pdf (portable document format) has emerged as the standard and you can get the Acrobat reader from www.adobe.com.

There are many problems with the first approach. A4 portrait pages do not translate well to the screen and anything other than a very basic layout, say with multiple columns and text running around pictures, is likely to cause headaches.

On the other hand, if you start out with the intention of making web pages, most of these packages make good editors, although none offers the sophisticated web tools of a true web authoring package.

■ Supporting HTML

Each of the high-end magazine and book publishing packages takes a different approach. Of the three, **Corel Ventura** offers the most conventional route, supporting HTML features. The 'publish to HTML'

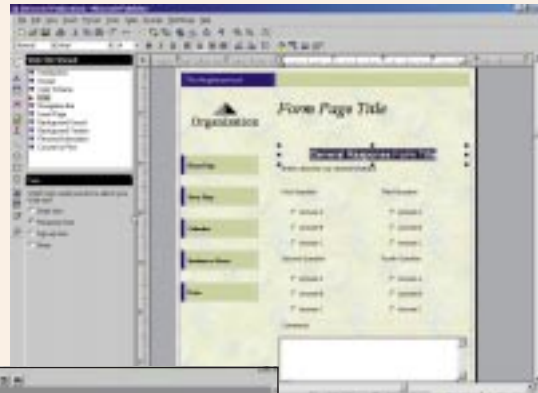
command generates web pages with support for frames, image maps, cascading style sheets, hyperlinks to chapters and files, ftp, news and mailto protocols.

There are some thoughtful additional touches. Typeset equations are converted to bitmaps and index entries are automatically linked to occurrences within the document. Using Corel Barista you can produce Java-based sites.

You can get a beta version of **Quark's HTML** export filter at www.quark.co.uk. More useful, and a great deal more expensive, is **Quark Immedia**, a multimedia add-on to XPress which lets you create web and CD projects complete with animation, sound, rollover buttons and hypertext linking and which has good testing and debugging features.

You can freely distribute the reader which runs under MacOS, Win95/8 and NT, making it a good choice for CD production but less so for web work where the format has failed to make an impact.

Adobe InDesign allows creation of Acrobat pdf files directly from within the application. Normally the



▲ **PUBLISHER'S WEB WIZARD IS THE BEST, WITH TEMPLATES FOR FORMS, CALENDARS, EVENTS, PRICE LISTS, AND MORE**
◀ **WITH ADOBE INDESIGN, YOU CAN CREATE ADOBE PDF FILES**

process involves first saving a PostScript file to disk then running it through Acrobat Distiller which creates the compressed pdf file before carrying out final editing in Acrobat Exchange.

■ Web wizards

The three newsletter packages all offer a similar wizard-guided approach to web page creation.

MS Publisher 98's wizards are the most comprehensive. It's no exaggeration to say that you could easily produce a template for a relatively sophisticated six-page site within a few minutes. There are 39 web templates and the wizard provides the opportunity to add specific pages for things such as events and price lists.

Other options include a variety of forms pages, navigation bars, sound and background tile textures. When you have finished you will be able to preview your pages in Internet Explorer before saving the HTML.

PagePlus' web page wizards are less flexible and

varied than Publisher's. But the basic template selection is good, with 17 options. However, Serif's wizard approach lets it down. PagePlus previews your site using your installed browser. Editing tools include a hyperlink manager and you can insert scrolling banners and animated gifs, created using the excellent application provided.

Pressworks' web pilot divides templates into business and leisure formats. The latter has four attractive layout styles and the pilot process allows a fair degree of customisation including additional pages for news, special deals, events and links to other sites.

Editing is not so straightforward. To create links to areas within the document, whether they are pages, text or frames, you first have to create a bookmark. You then position the cursor at the jump-off point and select the relevant bookmark as the target. For all but the simplest of home pages it becomes too complicated to be worth bothering with. Netscape Navigator 4.0 is supplied on the CD.

Book Publishing

Book publishing presents its own set of problems, mostly to do with keeping track of content across a long publication that may consist of many hundreds or thousands of pages. Automation can save hundreds of hours of tedious, painstaking work involved in creating a table of contents and an index. Cross-document style sheets ensure that each chapter of a publication will look exactly the same.

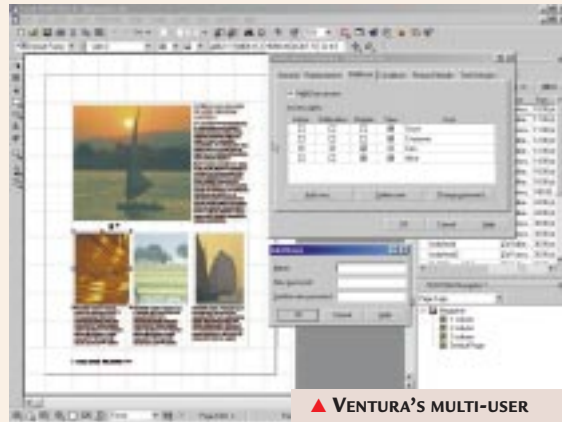
Two features which make **Ventura** the obvious choice for lengthy, group-authored publications are its version control and automated indexing facilities. Ventura automates the creation and

maintenance of indexes, tables of contents, cross-references and footnotes.

Tables of contents are generated from paragraph tags, and indexes from text files containing the words marked as indexed entries.

Ventura's navigator panel displays icons to indicate the current status of multi-user publications. So, if someone else is currently working on the document a checked-out icon appears and the document can be only accessed by other users on a read-only basis.

Corel Ventura provides basic archiving and retrieval functions including a facility to compare two versions of a publication to see the text differences between them.



▲ **VENTURA'S MULTI-USER FEATURES LET SEVERAL AUTHORS CO-OPERATE ON A PUBLICATION WHILE THE ADMINISTRATOR IS RESPONSIBLE FOR THE STYLE SHEET AND USER ACCESS**

Quark incorporated similar book publishing features into version 4.0 of **XPress**, which allows you to create a book file — a collection of XPress documents which share the same style sheets, colours, hyphenation and justification (H&Js), lists, dashes and stripes. There is also a useful facility to control page numbering across multiple

documents. Quark automatically generates a table of contents (TOC) using a list — a group of paragraph style sheets — and this list is used to regenerate the text to which the styles apply.

Table of features



PRODUCT	QUARK XPRESS 4.0	COREL VENTURA 8.0	ADOBE INDESIGN	MS PUBLISHER 98	SERIF PAGEPLUS 5	POWER PUBLISHER
TEL No	01483 445566	00161 37280826	0131 4516888	0345 002200	01625 539494	01480 496666
URL	www.quark.co.uk	www.corel.com	www.adobe.com	www.microsoft.com	www.serif.com	www.gspitd.com
Platforms	Win95/98/NT, MacOS	Win95/98/NT	Win95/98/NT, MacOS	Win95/98/NT	Win95/98/NT	Win95/98/NT
Street price inc/ex VAT	£816.62 / £695	£339.57 / £289	not yet announced	£78.72 / £67	£48.52 / £39	£49.95 / £42.50
	Passport £1,032.83 / £879					
Stylesheets	✓	✓	✓	✓	✓	✓
Multilingual	Passport	✓	✓	X	X	✓
Colour management	✓	✓	✓	✓	X	X
Plug-ins	✓	Quark Xtensions	✓	X	X	X
Colour separation	✓	✓	✓	X	✓	✓
Scripting	X	✓	✓	X	X	X
Bézier tools	✓	✓	✓	X	X	X
Clipping paths	✓	X	✓	X	X	X
Text on a path	✓	✓	✓	X	X	X
Text to path	✓	✓	✓	X	X	X
Auto TOC	✓	✓	X	X	✓	X
Auto indexing	✓	✓	X	X	✓	X
Multiple users	✓	✓	X	X	X	X
Tables	X	✓	✓	✓	✓	✓
Web features	Immedia	HTML export	pdf creation	web wizard	web wizard	web pilot
	HTML export filter	image maps		HTML export	scrolling banners	HTML export
		Java		animation & sound clips	animated gifs	

Editor's Choice

By default, our **Editor's Choice** for magazine publishing goes to **Quark XPress**, the winner of last year's award. Even though Adobe InDesign beats Quark hands down in every department, it is as yet untried and untested in the field. XPress has been the software of choice for the magazine publishing industry for almost a decade now and with good reason.

For one thing, there are economic reasons. Quark XPress is used to produce just about every magazine in print. There are many well trained, highly experienced designers and operators who know the package inside out. There is a huge installed base and support network of output bureaux staffed by knowledgeable professionals whose waking hours are mainly concerned with pre-press configuration and output of Quark XPress documents. Given all that, it takes a brave production manager to move to a brand new, untried, unsupported application, regardless of its apparent advantages.

You also have to ask yourself, what would I like that Quark doesn't provide?

The improvements introduced last year with version 4.0, particularly the Bézier functions,

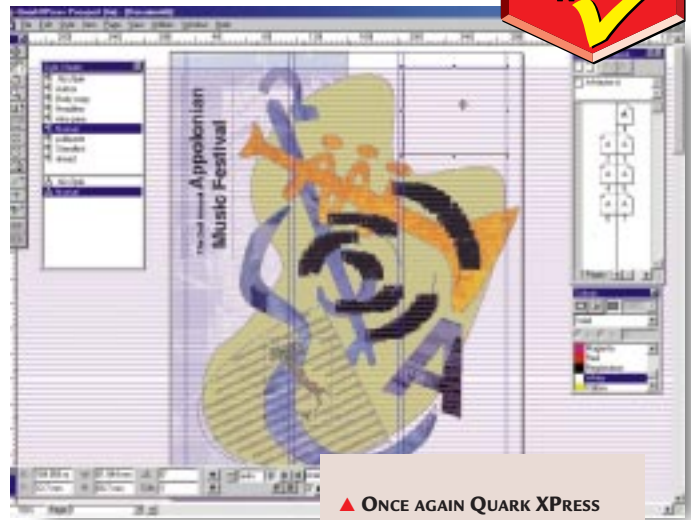
improved text handling and book publishing features, have kept Quark well ahead of the competition and given users pretty much everything for which they have asked.

Nothing will tempt XPress users away from a product they understand and trust — at least, nothing short of the radical

advances in the way we use applications to create and display content on

the web or printed page, as promised by InDesign. Our bet is that by this time next year, Adobe's pretender to the professional DTP throne will be well on the way to usurping the title.

Although it provides strong book publishing features, good Bézier support and tight integration with other Corel products, Ventura now lacks any distinguishing feature to make it an



▲ **ONCE AGAIN QUARK XPRESS WINS OUR EDITOR'S CHOICE FOR BUSINESS USE — BUT ADOBE IS CLOSING IN**

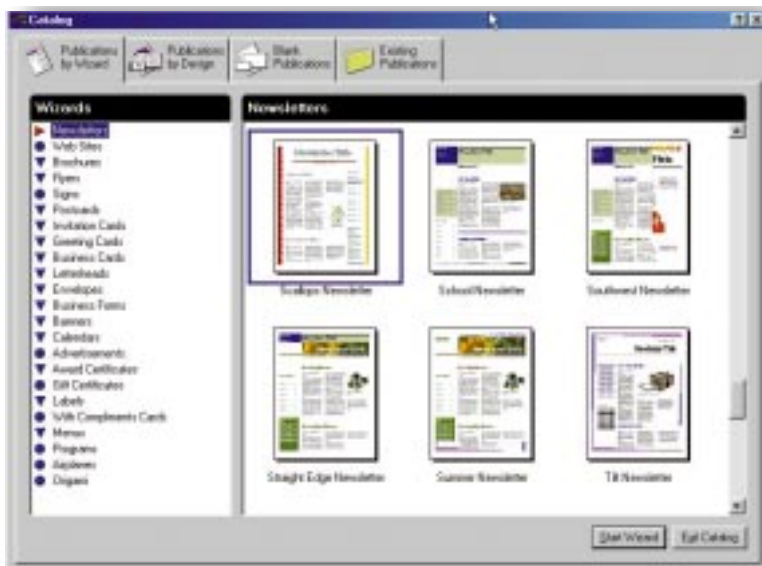
attractive proposition for those not already committed to Corel.

◀ **For home** newsletter production, our **Editor's Choice is Microsoft Publisher 98**. The company everyone loves to hate has got it absolutely right with this one. Its templates are the best designed, most attractive and most appropriate of anything we've seen. The business templates look, well, businesslike and the plethora of cheesy clipart which normally populates pages intended for home and hobby use is mercifully absent.

From a good start, Publisher 98 expands its lead with a wizard process which asks intelligent questions and produces a wide variety of possible outcomes on the basis of your answers.

For similar reasons, **GSP Pressworks 3 is Highly Commended**, namely for its good range of templates and page pilots which do more than overwrite your name and address. Like Microsoft Publisher 98, Pressworks follows through with continued onscreen help and advice for those who need it.

Finally, Serif PagePlus deserves a mention for its proofing capabilities and for its excellent web support, even though judged on our chosen criterion of newsletter publishing it fell some way behind the other two products. □



◀ **MICROSOFT'S PUBLISHER 98 HAS GREAT WIZARDS AND SOME OF THE BEST TEMPLATES WE HAVE SEEN**



Illustration by Kevin O'Keefe

Storage depot

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- 170 Hard drives**
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Reviewed by Dave Mitchell and Ajith Ram

Floppies all full up? Hard disk had enough? Here's where we look at **what's hot in storage and backup.**

Some things in life seem to stay the same while all around them changes. And so it is with PC storage. Since their introduction, floppy disks have been a standard feature in our PCs, providing an easy way of storing and backing-up data. But times change and the floppy's 1.44Mb capacity is now woefully inadequate, leaving users needing a faster and larger-capacity means of backing up their ever-growing data files. In this group test, we have

benchmarked eight of the most likely candidates for backing up your data.

Similarly, hard disks have relied on the same basic technology for many years although improved interfaces, speeds and capacities have meant that they have kept pace with current needs. With cost per megabyte being at an all-time low, we look at eight hard drives with various capacities and interfaces to find the best and fastest choice of permanent storage.

Removable storage

The floppy disk drive should have become extinct years ago and yet it is still an essential part of your PC. Data files and applications are growing at an alarming rate and if you want to liberate hard disk space or transfer files across PCs you need something with far more capacity and speed. Here, we look at some removable storage alternatives.

Less than a year ago you would have been spoilt for choice both in storage capacities and technologies. Since then, lomega has bought up French company Nomai and stopped production of its hard disk-based products. Even more significant is lomega's recent buy-out of troubled SyQuest, halting development of the highly respected SparQ, SyJet and Ezflyer drives, leaving lomega's own JAZ hard disk-based products with literally no competition. In an interesting move, Sony has also put a hold on releasing its new HiFD drives.

▶ **THE PANASONIC SUPERDISK 10X**



The one area of technology that lomega has left well alone is magneto-optical drives — and quite rightly as it would be going up against some big names.

Zip 100 & SuperDisk 120

Your choice of removable storage device will be driven by four main factors: capacity, speed, interface and price. If you need around 100Mb on a single disk then you really have only two choices — lomega's ZIP 100 and the SuperDisk 120, available from a number of manufacturers.

The **SuperDisk 120** offers up to 120Mb on a single disk the same size as a floppy and is fully backward compatible with 1.44Mb disks. With BIOS and operating system support



▶ **IOMEGA'S USB VERSION ZIP 100**

it can also be used as a bootable drive. Windows 95 OSR2 and Windows 98 fully support the SuperDisk and it will automatically assign it with the next available drive letter.

Iomega's ZIP 100 has the widest range of interface options.

We looked at the external parallel port and USB versions but there's also SCSI and internal IDE models.

Choosing SCSI will only be viable price-wise if your system already has a suitable host adapter card installed. The USB model stands out thanks to its see-through plastic shell and it's easier to install because you load the software and drivers first and then connect it to a USB port with the supplied cable.

▶ **IOMEGA'S NEW ZIP 250**



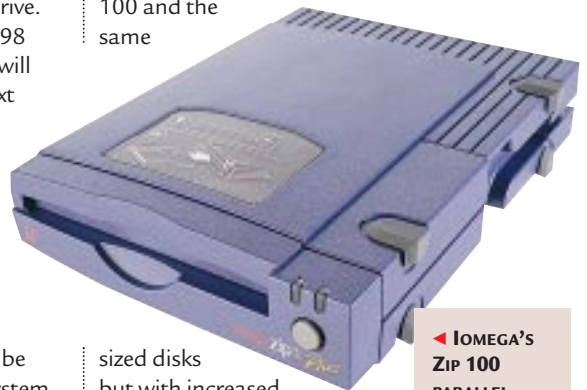
However, if you're still using Windows 95 you must be running OSR2.1 and also have the USB supplement installed.

The USB ZIP 100 out-distances the opposition at this level and delivers good backup and restore speeds across the board. If you're storing clipart or photographs, the USB drive will also be a better bet as it completed the thumbnail browsing and slideshow tests substantially faster.

Clearly, the SuperDisk is no speed merchant but it's the cheapest drive on test. Media costs are lower and it can completely replace the floppy disk drive. In pence per megabyte, the ZIP 100 disks are one of the most expensive on the market.

Zip 250 & PowerMO

Moving up in capacity brings us to lomega's new **ZIP 250** which uses the same recording technology as the ZIP 100 and the same



◀ **IOMEGA'S ZIP 100 PARALLEL PORT VERSION**

sized disks but with increased capacity. SCSI and parallel interfaces are on offer and the drive accepts 100Mb ZIP disks. The SCSI drive has a 25-pin D-Sub connector although it offers optional cable converters.

We tested both drives and found the SCSI interface to be substantially faster. Media costs are noticeably lower than the 100Mb disks. We were not overly impressed with build quality though, as the internal mechanisms are not held securely inside the chassis.

▶ THE OLYMPUS
PowerMO



At this storage level, there is competition from magneto-optical (MO) drives. Olympus' **PowerMO** uses 230Mb MO disks with SCSI and parallel interfaces. The drive is small but feels more solid than the ZIP 250. If you have a SCSI adapter card, installation is simple although it uses Mac-style 25-pin D-Sub connectors so you will probably need a converter cable. Olympus includes a parallel port cable that has a pass-through socket allowing a printer to be attached.

Overall performance for the PowerMO is uninspiring and will get even worse if you use the parallel port. Backup times are lengthy as the drive performs verification when writing data to the disk. Read operations are more impressive and the drive performed particularly well in the slideshow and browser tests showing Olympus' target market of users, who wish to store and view photo images, to be spot on.

The initial outlay for the PowerMO is comparatively high although overall

storage costs are around half that of the ZIP 250. The media is more robust as a laser is used to write data so nothing comes even close to contacting the disk's surface. MO is an ideal medium for archiving data and storing it over long periods because the disks have a guaranteed life of 30 years.

MO640 & LF-1500

If you need more storage and some radical drive design then the **LaCie MO640** should fit the bill. It comes with Centronics and 25-pin D-Sub SCSI connectors so it will work with either a PC or a Mac. The MO640 performs better when reading data as it also carries out write verification.

Overall though, it turned in some good times, particularly in the image-based tests.

Panasonic's LF-1500 stands out from the crowd as a combined PD and eight-speed CD-ROM drive. The large cartridges offer 650Mb of storage and recording is carried out using a unique phase change method where a laser is used to modify the structure of the recording surface. When the LF-1500 is installed, it is assigned separate drive letters for the PD and CD-ROM

functions. The drive is solidly built with a small LCD display panel on the front showing the type of media loaded, or track details if a music CD is being

played. It uses a parallel port connection only and this resulted in a lacklustre performance.

The bundled parallel cable has a pass-through port. But do bear in mind that

you cannot use both drive and printer simultaneously and will have to swap between the two using the supplied PD-Printer Switch software utility.

JAZ 2Gb drive

If you need a removable drive that offers performance close to hard disk speed then the only options are the 1Gb or 2Gb versions of the **lomega JAZ** drive. Both are available as internal and



◀ THE IOMEGA
JAZ 2Gb DRIVE

external drives but only with a SCSI interface.

Performance is excellent with the JAZ 2Gb drive taking podium position in every test and by a huge margin. This makes it ideal for a wide range of applications such as audio and video presentations that can be easily transported across different PCs. The JAZ media feels more solid than most and uses a dust-flap to protect its innards when not in use. The JAZ 2Gb is fully compatible with 1Gb cartridges. At £254, the JAZ 2Gb represents good value for the large storage capacity.

■ Bundled software

That's the hardware side, so what about the bundled software?

◀ **lomega** offers the best package with lomegaWare, an updated version of lomega Tools. A backup utility is standard while Symantec's Norton Zip Rescue creates a boot disk combination of floppy and ZIP disk to get your system running in the event of hard disk problems.

◀ **Panasonic** doesn't provide anything with its SuperDisk 10X but includes a single-user copy of Seagate's Backup Exec backup software with the LF-1500.

◀ **LaCie** provides 'Here and Now' which allows MO disks to be transferred between Mac and PC systems. You also get Formatter One Pro for partitioning and testing MO disks.

◀ **Olympus** includes basic backup with NovaDisk SE while PhotoAlbum provides picture archiving and viewing facilities.

DAVE MITCHELL



◀ THE PANASONIC
LF-1500 PD CD

Editor's Choice

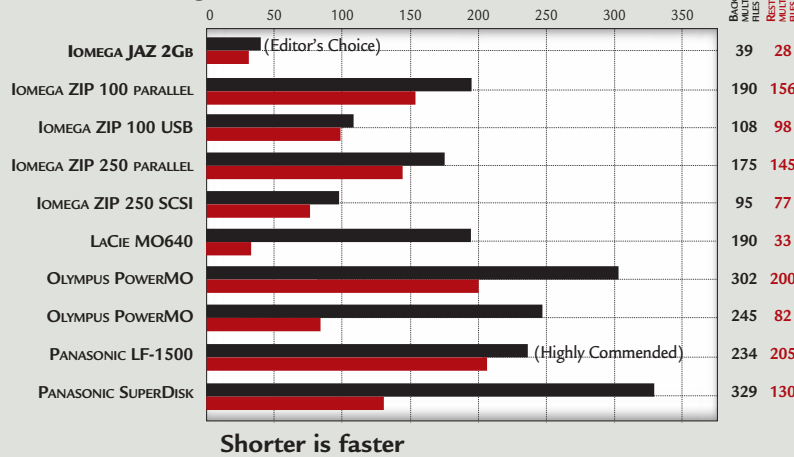
Although lomega seems to be tying up the loose ends in the removable storage market it's good to see that there are other options available. MO drives represent a viable and ultimately more reliable means of removable data storage while the SuperDisk 10X is the only true floppy disk replacement. **Panasonic's LF-1500** may not be fast

but could prove to be useful as it adds CD-ROM capabilities that may appeal particularly to laptop users who want both features while on the move, so this is **Highly Commended**. However, if you need top performance and storage capacity then **lomega's 2Gb JAZ** drive is the only one to go for and so this is our **Editor's Choice**.

PCW Labs Report



Removable storage benchtest results



We have shown the scores, in seconds, for multiple file backup and restore as this is how most people will be using the drives. These results show the strength of the Iomega drives in terms of speed. Interface makes a great difference to the speed, with both SCSI and USB showing marked improvements over parallel drives. The single file backup and restore tests ranked the drives in the same order as shown here. The ACDSee32 tests showed the LaCie drive to be the second fastest, after the JAZ, with the two Panasonic drives again being very slow. More than anything else, these tests showed the need for a fast interface. The four fastest drives all had SCSI interfaces, with the USB ZIP as the next fastest contender.

How we did the tests



We used a PII 266MHz PC with 64Mb of memory, running Windows 98. We used 83.6Mb of Word documents, PowerPoint presentations and Excel spreadsheets. To test sustained transfer rates we also used a 73Mb video clip. First the data was copied to the test drive and then restored back to the hard disk.

Removable storage is increasingly being used to store large photo images so we devised two tests to see how well

each handled these types of files. We used ACD Systems' ACDSee32, designed to view images by creating a display of small thumbnail pictures. A directory containing 35 2.6Mb bitmaps was copied to the test drive and ACDSee32 was asked to automatically display thumbnails. You may also wish to store multimedia presentations for display so we tested this using its SlideShow feature. Using the same bitmaps, it was configured to display each picture sequentially at full screen size with no delay between loading each one.

Table of features

PRODUCT	IOMEGA JAZ	IOMEGA ZIP 100	IOMEGA ZIP 100	IOMEGA ZIP 250
Phone	0800 973194	0800 973194	0800 973194	0800 973194
URL	www.iomega.com	www.iomega.com	www.iomega.com	www.iomega.com
Price ex VAT / inc VAT	£254 / £299	£75 / £89	£84 / £99	£144 / £169
Interface	SCSI	Parallel	USB	Parallel
Other interfaces?	No	SCSI, IDE/ATAPI	See parallel version	SCSI
Storage technology	Hard disk	Floppy disk	Floppy disk	Floppy disk
Unformatted media size	2Gb	100Mb	100Mb	250Mb
Media price (ex. VAT)	£67.23	£7.66	£7.66	£12.77
Cost per Mb	3.28p	7.66p	7.66p	5.11p
Compatible media	1Gb JAZ	None	None	ZIP 100
PRODUCT	LACIE MO640	OLYMPUS POWERMO	PANASONIC LF-1500	PANASONIC SUPERDISK 10X
Phone	0171 872 8000	0800 0720070	0800 444220	0800 444220
URL	www.lacie.com	www.olympus.com	www.panasonic.co.uk	www.panasonic.co.uk
Price ex VAT / inc VAT	£279 / £328	£178 / £209	£299 / £351	£59 / £69
Interface	SCSI	SCSI/Parallel	Parallel	IDE/ATAPI
Other interfaces?	No	No	No	No
Storage technology	Magneto optical	Magneto optical	Phase change	Floppy disk
Unformatted media size	640Mb	230Mb	650Mb	120Mb
Media price (ex VAT)	£7.99	£5.95	£19.95	£7.50
Cost per Mb	1.24p	2.58p	3.07p	6.25p
Compatible media	540Mb MO	128Mb MO	CD-ROM	1.44Mb/720Kb

Hard drives



While CPU and graphics technologies are most commonly credited with deciding the speed of your PC, there is another component that deserves just as much credit. Without the spectacular advances in hard drive technologies, affordable modern computing would have been impossible. With the impending introduction of new technologies, hard drives are poised to become faster and more reliable. The most significant of these technologies is Ultra DMA66, otherwise called Ultra ATA66.

When Intel introduced the TX chipset in early 1997, one of its new features was support for Ultra DMA33. Theoretically at least, this protocol promised twice the

performance of its predecessor. The story is the same this time around.

Ultra DMA66 promises a maximum burst throughput of 66.6Mb/sec; twice that of Ultra DMA33. The new protocol also implements enhanced CRC (Cyclical Redundancy Check) for ensuring better data integrity. Despite its promise, though, Ultra DMA66 suffers from many of the handicaps of its predecessor. The 66.6Mb throughput is the absolute theoretical maximum which can be achieved, so this is the maximum burst throughput. In other words, it is the maximum throughput from the data buffer on the hard drive. Sustained throughput between the hard drive and memory will be much less.

To get the full benefit of Ultra DMA66, the motherboard chipset as well as the hard drive must support it. At present there are no motherboards which support the new protocol. However, upcoming chipsets such as Intel's Camino will support it. People using older motherboards will see little or no benefit.

Ultra DMA66 also requires a new type of cable. This cable uses 80 conductors; twice as many as those used by Ultra DMA33 devices. However, despite the increase in conductors, there are only 40 connecting pins. This makes the new protocol backward compatible with its predecessor.

Also coming up soon are much larger hard drives. Maxtor has a 50Gb UltraDMA66 hard drive, while Seagate has a 50.1Gb version, with either an Ultra2 SCSI or fibrechannel interface.

There are two main ways to format your hard drive. Low-level formatting is performed by the BIOS. As this is a procedure which can damage the drive, it is usually performed only by the manufacturer.

High-level formatting is required for installing an operating system such as Windows 98. Before formatting, you have to decide how many partitions the drive should have.

Early versions of Windows 95 use the FAT16 file system. FAT16 limits hard disk sizes to 2.1Gb so any larger drives will have to be partitioned and addressed as separate logical drives. FAT32, however, works more efficiently on larger drives and there is no need to partition any of the drives currently available using this file allocation system.

If you intend to use multiple OSes from the same hard drive, a dedicated partition has to be made available for each. As not all OSes use the same file system, separate partitions will need to be formatted in different ways. There are several utilities available to help you do this, such as Partition Magic from Powerquest (contact Pow 01202 716726, www.powerquest.com) and System Commander Deluxe from V-com (contact MediaGold 0171 419 9861, www.v-com.com).

Editor's Choice

The proponents of Ultra DMA have long claimed that the standard offers almost the same speed as SCSI. On the other hand, supporters of SCSI pointed out the interface's better overall throughput, low CPU usage and ability to handle multiple devices.

Maximum throughput of Ultra DMA66 is almost on par with SCSI2. This is quite evident from our test results. The 7,200rpm Maxtor

DiamondMax Plus 5120, is almost as fast as the 10,000rpm IBM DRVS-U SCSI drive. Moreover, it is cheaper than SCSI drives of the same size.

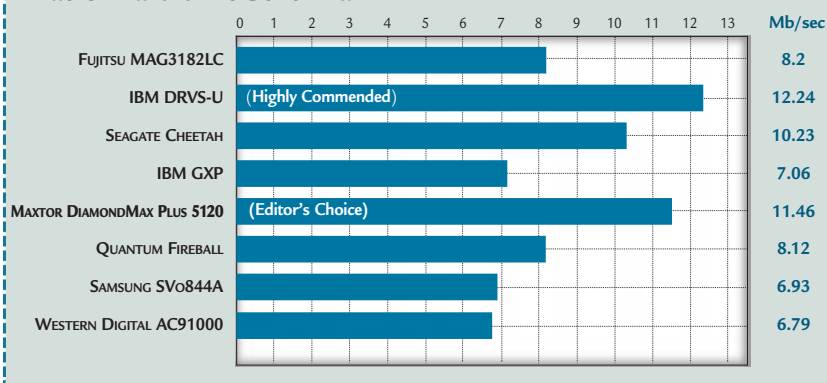
Our **Editor's Choice** is the **Maxtor** drive for its good performance at an affordable price per megabyte. And, the fastest drive in the test, **IBM's DRVS-U**, deserves our **Highly Commended** award for its outstanding performance results.

AJITH RAM

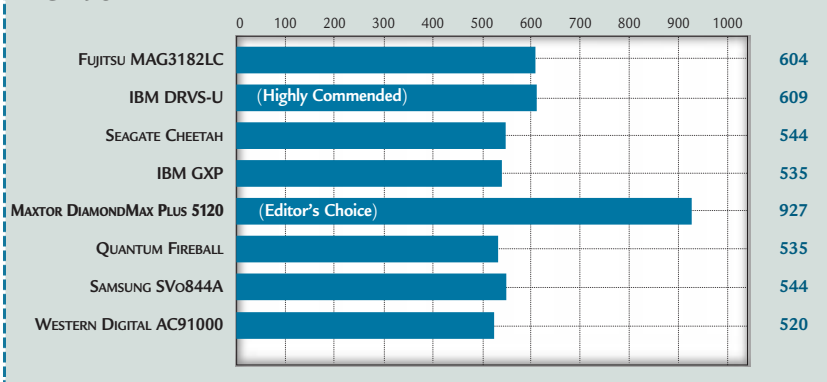
PCW Labs Report



Matrox hard drive benchmark



ECP 98



How we did the tests



At present, there are no motherboards available with

chipset-level support for Ultra DMA66. Therefore, tests of all IDE drives were conducted on a PC with an Abit BX6 motherboard, Pentium III 500 and 128Mb of RAM.

➤ We tested the hard drives using two benchmark suites. The Matrox Hard Drive Benchmark is used by Matrox Corporation to test the capabilities of the drives in their high-end video editing suites. The final result is the average of the hard drive's read/write speeds. Our labs test, ECP 98, reads and writes file sizes varying from 4Kb to 16Mb. It also measures data throughput to and from the hard drive buffer.

Table of features

MANUFACTURER	FUJITSU	IBM	SEAGATE	IBM
MODEL	MAG3182LC	DRVS-U 9LZX	ST318203LW	GXP DJNA-372200
Interface	SCSI2 LVD	SCSI2 LVD	SCSI2 LVD	Ultra DMA66
Capacity	18.2Gb	9.1Gb	18.2Gb	22.0Gb
Nominal speed	10,000rpm	10,000rpm	10,000rpm	7,200rpm
Size of data buffer	2Mb	2Mb	2Mb	1Mb
Tel no	01264 336991	01705 568525	01628 890366	01705 568525
URL	www.fujitsu.com	www.ibm.com	www.seagate.com	www.ibm.com
Price ex VAT	£620	£395	£630	£395
Price inc VAT	£728.50	£464.13	£740.25	£464.13
MANUFACTURER	MAXTOR	QUANTUM	SAMSUNG	WESTERN DIGITAL
MODEL	DIAMOND MAX PLUS 5120	QM313000CR-A	SV0844A	AC29100
Interface	Ultra DMA66	Ultra DMA66	Ultra DMA66	Ultra DMA66
Capacity	20Gb	13Gb	8.4Gb	9.1Gb
Nominal speed	7,200rpm	7,200rpm	7,200rpm	7,200rpm
Size of data buffer	1Mb	1Mb	1Mb	1Mb
Tel no	01923 712448	00 353 42 93 55 100	0181 391 8299	0113 2444958
URL	www.maxtor.com	www.quantum.com	www.samsung.com	www.westerndigital.com
Price ex VAT	£315	£190	£135	£155
Price inc VAT	£369	£223.25	£158.75	£182.13



In the fast lane

They're off! We catch up with twelve **graphics cards** making their mark in a fast-moving market.

There's no denying that computer technology moves fast, with new components making the latest equipment look dated in a matter of weeks. Perhaps the fastest-moving market is graphics cards. Here, product life-spans are measured in mere months, and with so many players competing, prices are low and choice is wide.

Since our last graphics card group test in the November '98 issue, a host of new technologies and chipsets have hit the market. Already, last year's award winners are beginning to look jaded compared to the new entrants. The TNT chipset has made its mark, and 3Dfx has just released the Voodoo3.

Illustration by Dave Wood

For this group test, the emphasis is not on brute speed alone. To judge the winners, we considered factors like image quality, ease of installation, advanced feature set (e.g. 32-bit rendering, stencil buffer, DVD support) and price. Overall, we were trying to find the best graphics card for a general-purpose multimedia PC.

Ratings

- ★★★★★ Highly recommended
- ★★★★ Great buy
- ★★★ Good buy
- ★★ Shop around
- ★ Not recommended

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Tested and reviewed by Ajith Ram

3DFX Voodoo3 3000

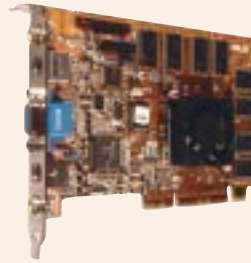


The Voodoo3 3000, unlike its predecessor, is aimed at the OEM market. It has 16Mb of memory which cannot be upgraded. Despite being 3Dfx's latest chipset, the Voodoo3 suffers from many of the limitations of the Banshee. It does not support 32-bit rendering, anisotropic filtering or motion

compensation for DVD playback, and it lacks a stencil buffer. Neither does the chipset support AGP texturing during 3D rendering. However, the Voodoo3 3000 is extremely fast: the 3DMark99 score of 2798 demonstrates its extremely high fill rate and triangle throughput. But its lack of advanced features make it a less complete mainstream solution.



ASUS V3300

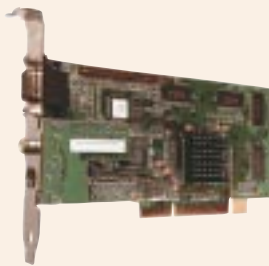


Asus is better known for motherboards than graphics cards. Built around the TNT chipset, in terms of sheer size, the V3300 is probably the largest card on the market. It has a huge fan, not just a heatsink. In addition to standard monitor and TV-out, the V3300 can capture video, although this is heavily

dependent on the CPU. The Asus driver utilities are also quite impressive. As in the Hercules drivers, there are advanced settings for Direct3D and OpenGL. This card supports full 32-bit colour, anisotropic filtering and 16Mb of memory, but its Direct3D performance is not impressive.



ATI Rage Fury

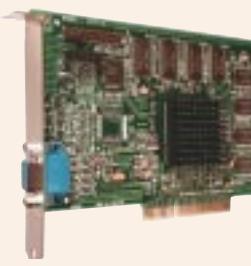


The Rage Fury, built around the Rage 128 chipset, is the successor to the highly successful ATI Xpert@Play. Like the Riva TNT chipset, the Rage 128 supports full 32-bit colour and a complete OpenGL ICD. To aid DVD playback, ATI has added IDCT (Inverse Discrete Cosine Transform) support in

addition to motion compensation. This results in flawless MPEG-2 playback. As befitting a gamer's card, the Fury has a TV-out and a whopping 32Mb of memory. Its 3D speed, although well below the Voodoo3, is more than adequate for upcoming games. 2D performance is also very impressive.



C. LABS Graphics Blaster Riva TNT



The name of the card says it all. This was one of the first graphics cards with the Riva TNT chipset to ship last year. Like the Viper V550, the Graphics Blaster Riva has 16Mb of SDRAM which is not upgradeable. The Riva TNT was designed to be fully compatible with

DirectX 6, and this is evident in its impressive benchmark results. It also boasts a high-quality OpenGL ICD. Overall image quality is excellent. The Riva TNT has a stencil buffer, a feature used by Creative Labs to produce some nice shadow effects in one of the popular games. However, performance of this card lags behind many others.



Table of features

MANUFACTURER	3DFX	ASUS	ATI	CREATIVE LABS
MODEL	VOODOO3 3000	V3300	RAGE FURY	GRAPHICS BLASTER RIVA TNT
Supplier	3Dfx	Dabs Direct	ATI	Creative Labs
Telephone	0171 546 8621	0870 129 3000	01628 533115	01245 265265
URL	www.3dfx.com	www.asustek.tw	www.atitech.ca	www.creaf.com
Price (ex VAT)	£120	£87	£120	£87
Price (inc VAT)	£141	£102.23	£141	£102.23
Interface	AGP	AGP	AGP	AGP
RAM/Max RAM	16Mb/16Mb	16Mb/16Mb	32Mb/32Mb	16Mb/16Mb
Chipset	Voodoo3	Riva TNT	Rage 128	Riva TNT
Ramdac	350Hz	250Hz	270Hz	250Hz
TV-out	✓	✓	✓	x
Max resolution/colours	2054x1534/32-bit	1920x1200/32-bit	1920x1200/32-bit	1920x1200/32-bit
Max refresh (at max res)	60Hz	75Hz	85Hz	75Hz
Windows drivers	95, 98, NT	95, 98, NT	95, 98, NT	95, 98, NT

DIAMOND Monster Fusion



Like the Maxi Gamer Phoenix [below], the Monster Fusion uses the Banshee chipset from 3Dfx. It therefore shares most of the limitations of the former. The Fusion has 16Mb of SDRAM but no TV-out. Interestingly, this card boasts a heatsink as well as a fan, which is useful, as the Banshee chipset tends to run very hot.

Despite being almost a year old, the Banshee still doesn't have a full OpenGL ICD, but it does use a MiniGL driver. Its DirectX support is quite solid. The high fill rate of the Banshee produces some very impressive benchmark results, but image quality is not the best.



DIAMOND Stealth 3



The Stealth 3 is built around the new Savage4 chipset from S3. This pre-production version has only 16Mb of RAM: the retail version will have twice that. The Stealth 3 also has a high Ramdac of 300Hz, and TV-out. The Savage4 supports 32-bit rendering, single-pass multitexturing and motion compensation for DVD playback. It's also the first AGP 4X chipset. Advanced features include an 8-bit stencil buffer, anisotropic filtering and bump mapping. Despite only beta drivers being available at the time of testing, stability was not a problem. Image quality is on a par with the Revolution IV and TNT. The Stealth 3 also has a digital flatpanel connector.



DIAMOND Viper V550

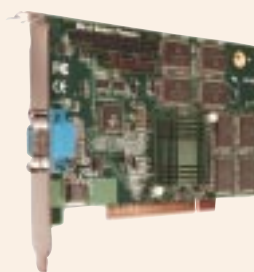


Diamond Multimedia is one of the best known names in the graphics card market. Its Viper V550, based on the Riva TNT chipset, won our Editor's Choice award last year. And despite the emergence of new contenders, the Viper V550 is no pushover. The card has

16Mb of SDRAM but no TV-out. The TNT supports full 32-bit colour and an 8-bit stencil buffer, and both DirectX and OpenGL. Image quality is excellent at all colour depths. The Viper V550 is the fastest TNT-based card in our group test. However, there is no motion compensation support for DVD playback.



GUILLEMOT MaxiGamer Phoenix



The not-so-enigmatic Phoenix from Guillemot uses the Banshee chipset from 3Dfx. Unlike all the other cards in this test, the Phoenix is strictly PCI. It doesn't support 32-bit colour, either. The Phoenix has 16Mb of SDRAM but the Banshee chipset has no OpenGL ICD;

it makes do with a MiniGL driver used only by games. As with all cards using the Banshee chipset, this driver limits the functionality of the Phoenix. The Banshee does not support single-pass multitexturing, so there's a significant performance hit in games using this technique. The chipset does not support hardware DVD playback.



Table of features

MANUFACTURER	DIAMOND	DIAMOND	DIAMOND	GUILLEMOT
MODEL	MONSTER FUSION	STEALTH 3	VIPER V550	MAXIGAMER PHOENIX
Supplier	Diamond Multimedia	Diamond Multimedia	Diamond Multimedia	Guillemot
URL	01189 444400	01189 444400	01189 444400	0181 944 1940
Web address	www.diamondmm.co.uk	www.diamondmm.co.uk	www.diamondmm.co.uk	www.guillemot.com
Price (ex VAT)	£75	£99	£87	£75
Price (inc VAT)	£88.13	£116.32	£102.23	£88.13
Interface	AGP	AGP	AGP	PCI
RAM/Max RAM	16Mb/16Mb	32Mb/32Mb	16Mb/16Mb	16Mb/16Mb
Chipset	Banshee	Savage4	Riva TNT	Banshee
Ramdac	250Hz	300Hz	250Hz	250Hz
TV-out	x	✓	x	x
Max resolution/colours	1920x1200/32-bit	1920x1600/32-bit	1920x1200/32-bit	1920x1200/32-bit
Max refresh (at max res)	75Hz	75Hz	75Hz	75Hz
Windows drivers	95, 98, NT	95, 98, NT	95, 98, NT	95, 98, NT

HERCULES Dynamite TNT



Hercules' Dynamite was one of many TNT cards to be released last year, but its drivers set it apart from the crowd. The Hercules display panel provides access to advanced settings for both Direct3D and OpenGL: users can increase performance at

the cost of overall image quality, or get a blend of both. You can even overclock the chipset and memory beyond its standard settings. The chipset is cooled by a fan rather than a heatsink. Like other TNT cards, the 16Mb of memory is not upgradeable. Image quality is excellent and performance is quite acceptable.

★★★★★

HERCULES Supercharger



The Hercules Supercharger is actually a revised version of the original Terminator Beast graphics card. It has 8Mb of SGRAM which is not upgradeable. Despite being effectively almost a year old, this card is an impressive performer. Like the Riva TNT and the Rage 128, the Savage

3D supports full 32-bit colour. Both 2D and 3D image quality is on par with the best. The Supercharger has TV-out but no stencil buffer. Unlike the Banshee, the Savage 3D has a full OpenGL ICD. The chipset also supports motion compensation for flawless DVD playback.

★★★★

NUMBER 9 Revolution IV



The Number 9 brand is well known for producing a wide variety of graphics cards, for the home and the workstation market. Like the TNT and Rage 128 chipsets, the Revolution IV supports full 32-bit colour and has a 250Hz Ramdac. The card supports resolutions

as high as 1920x1200 and a whopping 32Mb of RAM. The HawkEye display utility provides powerful features such as multiple virtual desktops, colour exchange, hardware magnification and panning – very useful in desktop imaging environments. The Revolution IV is not a high-performance Direct3D or OpenGL gamer's card, but if you crave excellent image quality, you can't go wrong.

★★★★

PACE 3D Edge



Despite its lack of advanced features like 32-bit rendering and stencil buffer, 3Dfx's Banshee has proved to be popular among board manufacturers. Pace's 3D Edge Banshee with 16Mb of memory has a TV-out port, and the memory is the superior SGRAM variety.

Unlike the Rage 128 and the Riva TNT, the Banshee does not support single-pass multitexturing so there's a performance hit in some games. The Banshee also lacks a full OpenGL ICD and hardware DVD support. Like many other Banshee cards, image quality is good, but not the best. The game Wargasm is included.

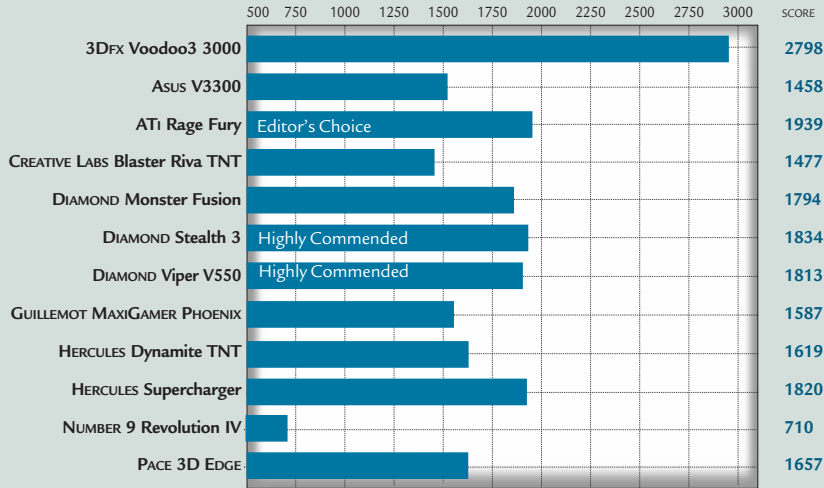
★★★★

Table of features

MANUFACTURER	HERCULES	HERCULES	NUMBER 9	PACE
MODEL	DYNAMITE TNT	SUPERCHARGER	REVOLUTION IV	3D EDGE
Supplier	Acal	Acal	Tai Computer Systems	Pace Communications
Telephone	01243 513434	01243 513434	0181 963 2900	01274 534333
URL	www.hercules.com	www.hercules.com	www.nine.com	www.pacecom.co.uk
Price (ex VAT)	£87	£75	£119	£85
Price (inc VAT)	£102.23	£88.13	£139.83	£99.88
Interface	AGP	AGP	AGP	AGP
RAM/Max RAM	16Mb/16Mb	8Mb/8Mb	32Mb/32Mb	16Mb/16Mb
Chipset	Riva TNT	Savage 3D	Revolution IV	Banshee
Ramdac	250Hz	250Hz	250Hz	250Hz
TV-out	x	✓	✓	✓
Max resolution/colours	1920x1200/32-bit	1600x1200/32-bit	2054x1534/32-bit	1920x1200/32-bit
Max refresh (at max res)	75Hz	75Hz	60Hz	75Hz
Windows drivers	95, 98, NT	95, 98, NT	95, 98, NT	95, 98, NT



3Dmark99 Results



How we did the tests

All three tests — Final Reality, 3Dmark99 and Quake2 — were run on a Pentium III 500MHz system with 128Mb RAM and a 7200rpm Maxtor hard drive. Some chipsets, like the Banshee, do not support 32-bit rendering. Therefore, in order to be fair to all, the tests were run at a resolution of 1024 x 768 at a colour depth of 16 bits. After the testing of each card, its drivers were removed before the next set of tests were run. All graphics cards were tested using the latest drivers available on their web sites.

3Dmark99

This benchmark is fully DirectX 6 compatible and tests advanced 3D features like trilinear filtering, anisotropic filtering and multitexturing. In general, graphics cards with high fill rate and single-pass multitexturing show better results. For instance, the high score of the Voodoo3 3000 reflects its high fill rate and triangle throughput. On the other hand, the original Savage 3D used on the Hercules Supercharger is not quite as powerful. This is reflected in its lower score. This benchmark also provides a reference image which can be used for judging the image quality of various cards. [For more on 3Dmark99, see this month's PC Group Test, p128.]

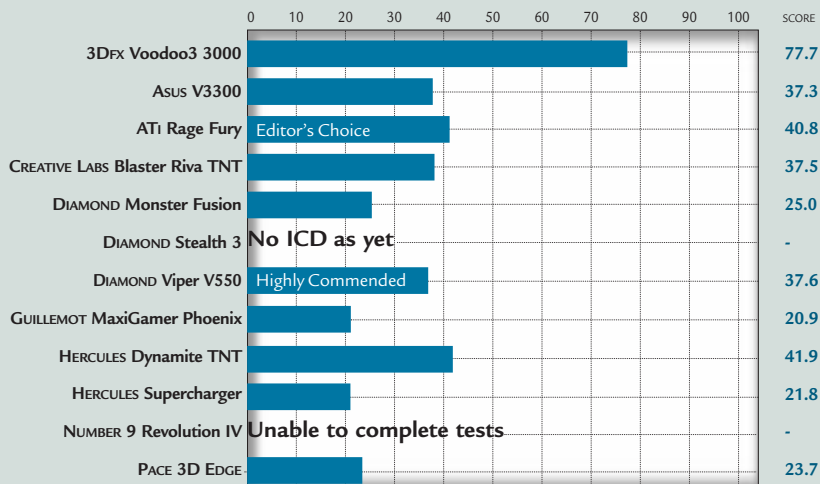
Quake2

Since its release, Id Software's Quake2 has become the industry standard benchmark for a real-world OpenGL application. In general, the Quake2 benchmarks go alongside the 3Dmark99 results. However, some of the results should be treated with caution: this is particularly true of graphics cards using 3Dfx chipsets. Instead of a full OpenGL ICD, 3Dfx chipsets like the Banshee and the Voodoo3 use a MiniGL driver. A subset of a full ICD, the MiniGL driver is highly optimised for Quake2, so those cards with this driver will run faster than those with a full ICD. The Diamond Stealth 3, as a beta card, did not yet have an OpenGL ICD, so could not run this test. The Number 9 Revolution IV also had problems, although this card is intended as a workstation card and is not meant to run games.

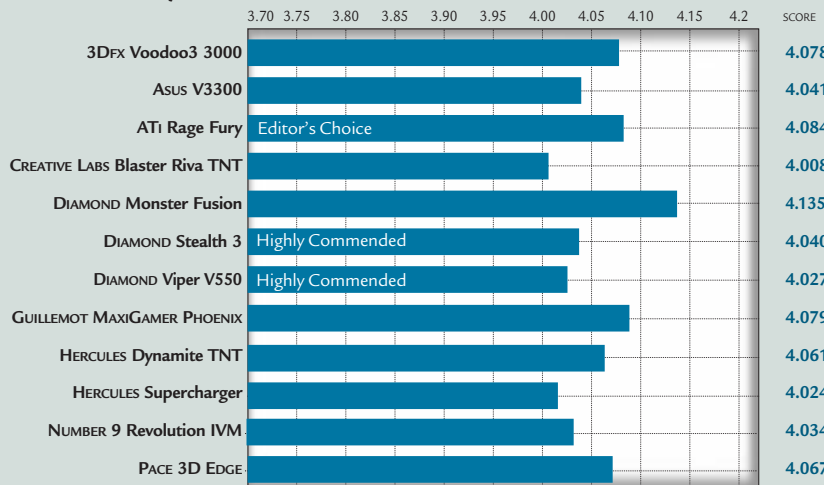
Final Reality

The 2D scores in this test reflect the card's ability to use DirectDraw, a part of Microsoft's DirectX API. As is evident from our results, all the graphics cards in this test are powerful enough to produce decent 2D performance, with minimal differences in the scores. A Ramdac above 230Hz, will provide a good flicker-free display at high resolutions — important in environments like desktop publishing where large monitors are often used.

Quake2 Results



Final Reality 2D Results



Editor's Choice



Speed has been the main focus of the graphics card industry for some time, sometimes at the expense of other features. While cards such as the Voodoo2 from 3Dfx were fast, 3D image quality suffered. But things have moved on. Newer chipsets like the Riva TNT and the Savage 3D introduced fast performance with excellent image quality, while the new TNT2 chipset previewed at Cebit (see our *News* section) combines great speed with outstanding quality.

DVD support has also emerged as a feature no self-respecting graphics card can do without. Without graphics card support, MPEG-2 and Dolby Digital decoding can bring even the most powerful CPU to its knees. The motion compensation support provided by the Savage4 on the Diamond Stealth 3, and the Rage 128 on the ATi Rage Fury, lead to flawless performance. Both cards ship with their own DVD utilities to support on-board hardware MPEG decoding.

For all-round performance and features, the **ATi Rage Fury** fully deserves our **Editor's Choice** award. It supports full 32-bit colour, has a complete OpenGL ICD, and sports TV-out to complement the DVD playback. With a whopping

32Mb of memory, both 2D and 3D performance is excellent without compromising image quality.

The pre-production model of the **Diamond Stealth 3** in our group test had a chipset clock speed of 100MHz — considerably slower than its 125MHz shipping speed. Yet, the Stealth 3's DirectX performance is better than all the TNT cards and only slightly slower than the ATi Rage Fury. With its impressive 3Dmark99 performance and low price, the Diamond Stealth 3 is the card to watch. So, for an outstanding performance achieved by a beta card, it wins a **Highly Commended** award.

The TNT-based **Diamond Viper V550**, despite being a generation older than the Rage Fury and the Stealth 3, is no slouch. For good performance and

excellent image quality it, too, is **Highly Commended**.

But what of the Voodoo3? Despite its blistering performance and high fill rate, it has a 16-bit rather than a full 32-bit Z-buffer, so on games with large open spaces like mountains and valleys, it might display some annoying visual glitches. It might also create ugly banding at high resolutions. The 3Dfx card also lacks DVD motion compensation support and has no TV-out — both features that most users would want to see on their graphics card. With upcoming TNT2-based cards, such as the VideoLogic Neon250, producing even higher speeds, the Voodoo3 doesn't cut the mustard.

Bump mapping: a straight answer

Every once in a while, a certain concept, accompanied by a buzzword, captures the imagination of the graphics-card market. Last year, to a large extent, this was epitomised by the debate over different forms of multitexturing. The familiar cycle is now repeating itself with another vaguely defined concept — that of bump mapping.

Bump mapping is a technique which enhances the visual realism of textures or objects in a three-dimensional environment. A bump map provides the illusion of depth on an otherwise bland surface. For instance, without bump mapping, a mountain within a 3D environment would look something like a series of interconnected pyramids, but a bump-mapped mountain can have realistic ledges and protrusions.

The concept of bump mapping itself is not new: high-end 3D animation packages such as Lightwave 3D and SoftImage have long included it as a standard feature. What's new is the inclusion of this feature in Microsoft's DirectX API.

The inclusion of bump mapping in DirectX 6 meant that the large community of games developers could take advantage of it. This in turn put pressure on graphics chipset manufacturers to support this feature.

DirectX 6 supports various forms of bump mapping, one of which is a specialised form of multitexturing, or embossing. Some graphics chipsets, like the Rage 128 from ATi, use this method.

This embossing method has a few disadvantages. One of the problems is that it is a form of software bump mapping;

in other words, it's extremely CPU intensive. True bump mapping is dependent on the source, or sources, of light. Software bump mapping doesn't take any light source into consideration, which often leads to some very unrealistic results. Software bump mapping also requires the programmer to manipulate each effect individually, which is extremely time consuming.

Hardware bump mapping in DirectX 6 is often called environment mapping. Because it is handled by the graphics chipset, hardware bump mapping is much less CPU intensive.

Buyers who are on the lookout for new graphics cards would do well to look for chipsets which support true hardware bump mapping. The G400 chipset from Matrox and the Permedia 3 from 3D Labs are good examples. □

MIT is hooked on the **fish interface** and Toby Howard foresees the end of the mouse.

Gone fishing

Love it or loathe it, the WIMP — Windows, Icons, Mouse and Pointer — interface is universal and has changed little since its inception. But soon you may be putting your mouse to one side, and reaching instead for a 'fish'.

The ideal human-computer interface, according to a group of researchers at the Massachusetts Institute of Technology (MIT), is to have no apparent interface at all. The conventional mouse is an encumbrance with its desk-bound wheel and restrictive cabling. It's easy to deal with the cabling, and switching to a wireless mouse which uses digital radio to communicate with the PC can be a liberating experience. But what about doing away with the mouse altogether?

Various strategies have been tried for creating a 'device-less' interface, based on interpreting the user's hand positions and gestures. Approaches like infra-red beams and ultrasound have the drawback of suffering interference and cannot reliably provide accurate measurements. Multi-camera video



▲ GUESS WHAT THE NEW MOUSE IS? IT'S A FISH...

Many species of fish use electric fields for sensing their environment and **UNLIKE A MOUSE, A FISH CAN MOVE** around effortlessly in three dimensions

systems can capture 3D information, but the images require an enormous amount of computation to extract the data, making full, real-time interaction difficult to achieve.

The problem is that there's simply too much information in video. To track the movement of a hand, say, many systems use edge detection algorithms to find the outline of the hand in the video image. Compared to the whole picture, this is a tiny amount of information, but extracting it is a real headache.

One technology looks promising, though. It's called 'electric field sensing'. Leon Theremin used it in 1919 to control one of the first electronic musical instruments; the Theremin <www.nashville.net/~theremin>. Everything about this instrument is strange, from its eerie, plaintive tone to its 'user interface'. It is possibly the only musical instrument you never actually touch. There are two antennae: one controls the pitch of the sound, the other its volume. As the

player's hands move in front of the antennae, the capacitance of the system changes, which in turn alters the pitch and volume of a beat-frequency oscillator.

Now, the MIT team has taken the hands-off idea and applied it to the human-computer interface. They call their system a 'fish', since many species of electric fish use electric fields for sensing their environment, and, unlike a mouse, a fish can move around effortlessly in three dimensions.

The user sits in a chair which conceals a low-power, low-frequency radio transmitter. Around the monitor are small receivers which track the user's gestures in the space around and above the desktop. The accuracy of the gesture recognition can be increased by adding more sensors to form what the researchers call a 'school of fish'.

The 'fish' has already been successfully used in a touring multimedia art exhibit called the Brain Opera <brainop.media.mit.edu>. One part of the exhibit is the Gesture Wall. The participant stands on a metal transmitter pad, in front of a large back-projection screen. The graphics on the screen and accompanying music change in response to the way the player's body and hands move.

For conventional screen-based applications like word processing and email, the WIMP probably has a guaranteed future. But for sophisticated 3D applications like navigating virtual environments and VR gaming, the future might well be fishy. Watch this pliace. □

hands on

contents

As Douglas Adams stated: 'At least they knew the century was going to end!' He was referring to the Mac developers who advertised their already **Year 2000** compliant systems while sneering at the PC industry during a US SuperBowl break. Part three of our series on Y2K issues sees Cliff Joseph relishing this foresight although he does reluctantly admit to some potential problems. And, Nik Rawlinson bids farewell to *Hands-On* with the concluding episode of his **Web Site** workshop. A measure of self-promotion was required to demonstrate some issues (!) but I fully recommend you take a peek. There's a hard-core **programming** feel to some of our other columns, including UNIX and PDAs. Don't be put off, though, as the way these guys write you won't just be pleasantly entertained, you may even find yourself dabbling. There's scope for **developing applications** within these pages, including perhaps the beginnings of 3D games. Let me know about this and suggestions for the *Hands On* section via email at the address below.

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PCW Hands On section on CD-ROM

Now it's easy to find that *Hands On* tip, trick, advice or review again — there's a whole year's worth of columns on our monthly PCW CD-ROM. So if that handy hint is on the tip of your tongue, don't sit and sweat; the answer is at your fingertips.



Picture plus

Using PhotoDeluxe, Ken McMahon shows how easy it is to make more of your photos.

PhotoDeluxe 2.0, free on our cover CD this month, is perfect for photo projects. It has a great range of easy, guided activities for the beginner while the advanced mode offers some of the powerful tools found in Adobe Photoshop. Even if you want to dive straight in at the deep end, the guided activities are a great source of ideas for everything from cards and calendars to photomontages.

In this workshop, we're going to take an unimposing holiday snap, improve the quality so that it's bright and punchy, cut out the main subject from the background and add a more interesting backdrop. Finally, we'll add some text so that it's ready for printing onto anything from a greetings card to a T-shirt.

A quick piece of advice though: when performing any kind of photo manipulation it's always a good idea to make a copy of your original image. This way you'll feel free to play around to your heart's content, while retaining an unaltered version should things not go entirely to plan.



↪ **Fig 1** Here you need to adjust the brightness and contrast until you see some improvement in the image. If you've scanned from a print you'll probably need to increase the contrast a little. If you're using a digital camera you may need to decrease it. But don't overdo it. Even if your photo is very flat and washed out you should only make minor adjustments with these settings. If you need to adjust a scanned photo by

more than 50 percent you should consider rescanning with different settings. You can do quick before and after comparisons by checking and unchecking the preview box.

↪ **Fig 2** Next is colour balancing, which can be a tricky business. If you're interested, you can experiment with the sliders to see the effect of adding red, green or blue – adding all three has no effect and adding any two is the same as removing the third.



↪ **Fig 3** If your picture has a strong colour cast, you can remove it by using the colour balance but if this is too confusing click 'done' and go to 'fix colour' on the touch-up tab. The variations button shows you the effect of adding more red blue and green to the image.

↪ **Fig 4** There is one last thing to do before we move on to cutting out the background but you won't find it on any of the tabs so you will have to turn on one of PhotoDeluxe's advanced features; long menus. These give you access to all the tools and commands from the menu bar. Go to the file menu and select 'preferences, long menus' and the menu bar will expand to offer you more options. Then, from the quality menu select 'sharpen', or use the [ctr-1] keyboard shortcut. Now this is where the real fun begins:

• Click the special effects button and



from the collage tab select the 'change backgrounds' button.

• Click the 'smartselect' button on the select tab and position the crosshair cursor somewhere on the edge of the image you want to cut from the background. As carefully as you can, trace around the outline of your cut-out image and you will see the 'smartselect' marquee follow the edges.

↪ **Fig 5** The 'smartselect' tool works by identifying contrasting edges so, to make things easier to begin with, pick an area where the edge of your subject contrasts strongly with the background. If the 'smartselect' tool runs into trouble getting the right bits where there isn't so much of a contrast, put down frequent



anchor points by clicking with the left mouse button. Try to select more of the image than you need. In other words, rather than cut bits of your subject off, include some of the unwanted background as you can always get rid of it later with the eraser tool.

↪ **Fig 6** When you get back to where you started cutting, the 'OK' cursor will appear; click to complete the selection and then press the 'delete background'



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button. You should now have a reasonably accurate cut-out but there will be a few remaining nooks and crannies that you may not have been able to reach. To remove these, click on the erase button and select one of the brushes from the palette. The size will depend on how much extraneous background still remains but in any case make sure to select one of the soft-edged brushes to avoid nasty jagged edges.

- You may now discover that your cut-out has a fringe around it where there is still some unwanted background. You can clean up, as before, by using the eraser which you'll find in the tools menu.

➔ **Fig 8** You can add as many backgrounds as you like. Each one is treated as a separate layer and can be turned on, or off, rearranged and edited independently of the main subject, which remains on the topmost layer.

- First, turn on the layers palette by selecting 'show layers' from the 'view' menu. You will see three layers: a topmost, empty, text layer; then the layer with your cut-out subject; and your background picture.

- To add further layers, just drag an image from the Easyphoto browser onto the PhotoDeluxe 2 edit window, resize and position it and then press return. Now, if all you can see is the new image, don't worry, it hasn't obliterated everything. As you can see from the layers palette, your previous image is still there, beneath the new picture.

- Now position the new picture layer at the bottom of the stack by clicking on its layer at the top of the layers

palette and dragging it to the bottom.

➔ **Fig 9** Now it has disappeared because it is obscured by your original background on the layer above. To turn this layer off, click on the eye icon next to it and the new layer below will be revealed.

You can experiment by adding as many new background layers as you like and switching them on and off to create new compositions. By double-clicking on a layer in the palette you will be able to change its opacity and its

blend mode. Now we are going to add some drop shadow text.

- Click on the text tool — the T on the menu bar at the top of the edit window — to open the text dialogue box. Type in your text and select a font from the pulldown menu, and a colour. Pick something that contrasts well with the background.

- Drag the handles to size and position the text. Make sure the 'eye' icon is present on the top text layer in the layers palette or you won't be able to see it.

- Once the text is in position, select 'duplicate' from the edit menu, then



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double-click on the duplicate text and change the colour to a suitably dark drop shadow hue.

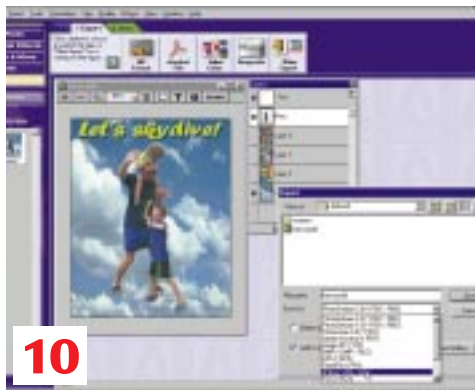
- Finally, click on the 'object order' menu — the one next to the text button that looks like two sheets of paper — and choose 'send to back'. If you have difficulty selecting the text, turn the other layers off to get a clearer view.



7

➔ **Fig 7** You're now ready to add the background. Click on the 'add background' tab, then, unless you plan to use your own background image, click on the 'sample photo' button. This will open the Easyphoto browser. There are plenty of background images from which to choose but if you can't find what you're looking for in the background category, try 'scenes':

- Double-click your chosen background to place it behind your subject. Click the 'resize' tab, drag and reposition your subject if needs be and click the 'done' tab.



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➔ **Fig 10** Finally, click the 'send' button to save your image. There are plenty of options. You can save it as a gif or jpeg for inclusion on a web page, create an HTML web page, an Acrobat pdf, a screensaver, wallpaper or embed it in an email. When saved, the image is flattened using only the visible layers. So, you can quickly save several different versions simply by turning off one background layer, turning on another and re-saving.



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Quick bucks

Alex Singleton shows how **Quicken SE 6** handles reciprocation and VAT returns.

Last month, we provided a free copy of Quicken SE 6 on our cover CD. In the second part of our *Hands On Workshop*, amongst other things we're looking at two types of reciprocation from Quicken: how to print reports and charts; and, for small business users, how to get Quicken to prepare your VAT return form.

On report

Let's start with creating a report or graph. On Quicken's Activity Bar, there is an icon labelled 'Reports'. Move the pointer over this and a menu will appear, offering three options.

The first, 'Show me a Graph or Report of my Finances', offers the basics. On the left of the window that appears [Fig 1] all you do is choose one of the questions, type in the details on the right and select Show Report or Show Graph.

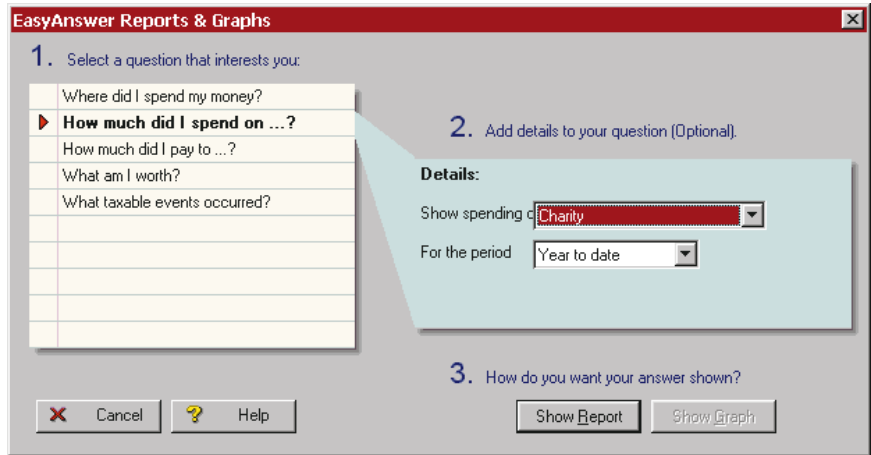
Back in the 'Reports' menu, the remaining two options allow the creation

The great thing about Quicken's reports and graphs is that they are updated automatically

of more complex reports and graphs. These include the VAT return reports, which we will look at later.

The great thing about Quicken's reports and graphs is that they are updated automatically so you can go back into the Register, enter some more transactions and, when you later look back, it will have been updated with the latest figures.

Each Quicken report or graph you produce is displayed in its own window, represented by a tab down the right-hand side of the screen, along with other Quicken windows such as Registers.



▲ Fig 1 REPORTING, THE EASY WAY

VAT matters

VAT-registered businesses have to charge VAT on their sales, which is then given to Customs and Excise minus the VAT paid on purchases. So how can Quicken be made to look after this?

When you create a new 'bank account', one of the questions you are asked is whether you want Quicken to 'track VAT' on the account.

Don't worry if you have already created an account

but only now wish to turn on VAT tracking. Move the mouse over 'My Accounts' on the Activity Bar and choose 'View All of My Accounts'. Now select the account and click on 'Edit' — this is not the Edit menu but a button below it — and choose 'Track VAT'. When you enter transactions into

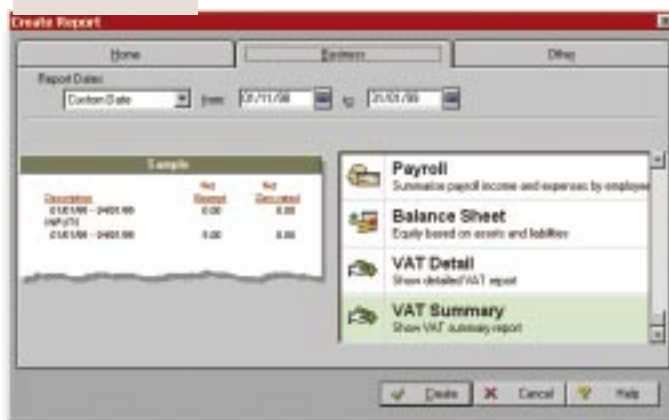
your bank account Register, Quicken works out the VAT.

Let's say you have just placed an advertisement at £1,000 inc VAT. Enter the transaction as normal. You will find that once it has been entered, the category shows it to have been split. What Quicken does is to split the purchase into two parts: the net amount under a normal category of your choice, and the VAT element. Additionally, Quicken will allow you to alter the VAT amount manually. And it also remembers whether a particular company, from which you have bought goods or services, charges VAT on its products.

A complication arises if you do not use what is called a 'VAT cash accounting' scheme. This scheme works on the basis that VAT is due when money itself passes hands — so tracking VAT with an ordinary bank account is perfect. However, most businesses use the 'accrual accounting' system, where VAT is due when an invoice is issued or received. Under this system, the transaction date you use in Quicken should not be the date on your bank statement but the date on the invoices you have issued or received.

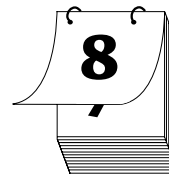
For accrual accounting users, Intuit recommends that you do not enter transactions into an ordinary bank account

▼ Fig 2 CREATING A VAT SUMMARY REPORT





Smug as a bug



The millennium should hold **no fears** for Mac users says Cliff Joseph.

The good news for Mac users is that the millennium bug is not really a problem. On Apple's web site there's a quote from writer Douglas Adams (a well-known Mac fan): 'We may not have got everything right, but at least we knew the century was going to end'.

Apple decided not to use the two-digit date format, the cause of the Y2K problem, when it introduced the first Mac back in 1984. All Macs store the year number using four figures so even the oldest Macs should tick over to 1st January 2000 without any problems.

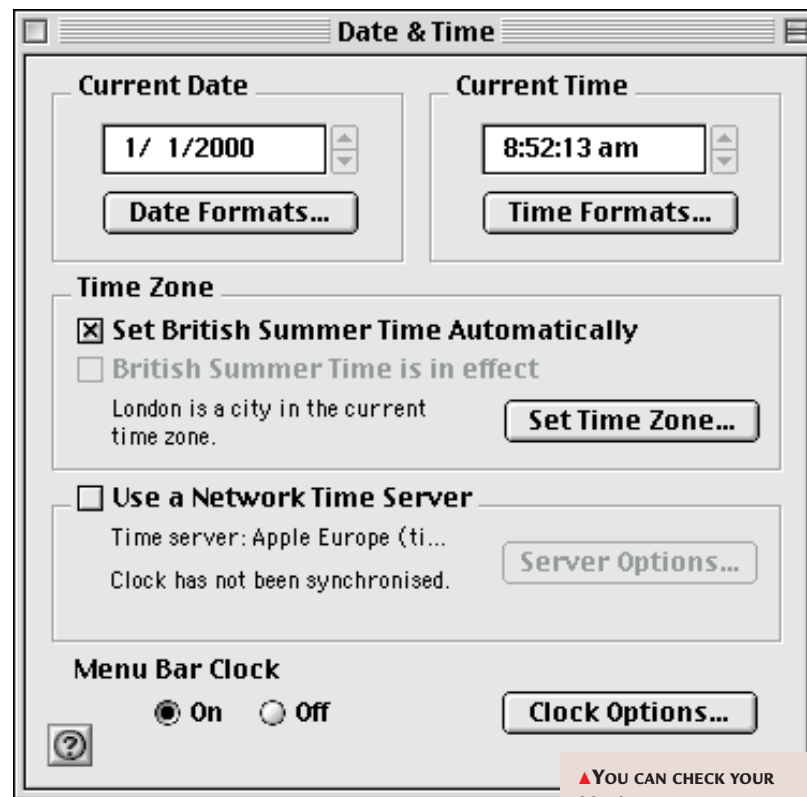
In fact, Apple recently bought one of the most expensive advertising slots on US TV, slap in the middle of the Super Bowl championship, to boast about the Mac's invulnerability to the millennium bug. The ad is unlikely to be used in the UK but it's quite good fun. Take a look at the version at www.apple.com.

Just to make extra sure, Apple has conducted additional tests on all versions of the Mac OS since 7.5.5 and confirms that these are all compliant. Apple's official advice, therefore, is that to avoid any problems you should only use one of the versions of the OS which is specifically listed as Y2K compliant.

For more details about which Mac hardware and software products are compliant, check out Apple's Year 2000 web site at: www.apple.com/about/year2000/. This site also includes Y2K information relating to peripherals as well as applications like ClarisWorks and FileMaker which have been developed by Apple subsidiaries.

➔ **There is a glitch** of some sort in the Date and Time control panel which means it can only store dates up to December 31, 2019. However, the problem only affects this particular control panel and the underlying operating system is still Y2K compliant, so as long as Apple revises the Date and Time control panel before the year 2020 we should be OK.

...at least we knew the century was going to end



▲ YOU CAN CHECK YOUR MAC'S SUPPORT FOR FOUR-FIGURE DATES IN THE DATE AND TIME CONTROL PANEL

➔ **The only recent** Apple products that might be affected by the Y2K bug are the PC-compatible models which have a PC-card built into them. Apple has not tested these for compliance so there is a possibility that PC applications running on one of these systems could be affected.

➔ **The only other** possible source of trouble comes from third-party software which you run on your Mac. It is possible that some applications have been programmed to use dates in a way that makes them vulnerable to the millennium bug. However, any program that follows Apple's standard programming guidelines should be

unaffected and we've not heard of any Mac applications which have a problem with the year 2000.

If you want to reassure yourself about your Mac's year 2000 compliance, just

open the Date and Time control panel which can be found in the Control Panels section of the main Apple Menu. Underneath the date listing is a button labelled 'Date Formats'. Pressing this button opens a dialogue box where you can select a variety of formats for displaying the date.

Select the 'Show Century' option and your Mac will then display the date using the full four-figure year format (i.e. 1999, rather than 99). Close this dialogue box to go back to the Date and Time control panel and then just change the time to 11:59pm on 31st December 1999. Leave the Mac for a couple of minutes and it should happily tick over to 1st January 2000 without a hiccup.

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Table manners

Forms and tables **add versatility** to your web page. Nik Rawlinson shows how.

Cast your mind back to our March issue, to the first part of this workshop, in which we constructed the bare bones of our site; those frames which now host the rapidly growing collection of pages that we have seen fit to inflict upon the browsing public. The structure has been maintained throughout, giving our pages a unified look and feel even though we may have used a variety of styles.

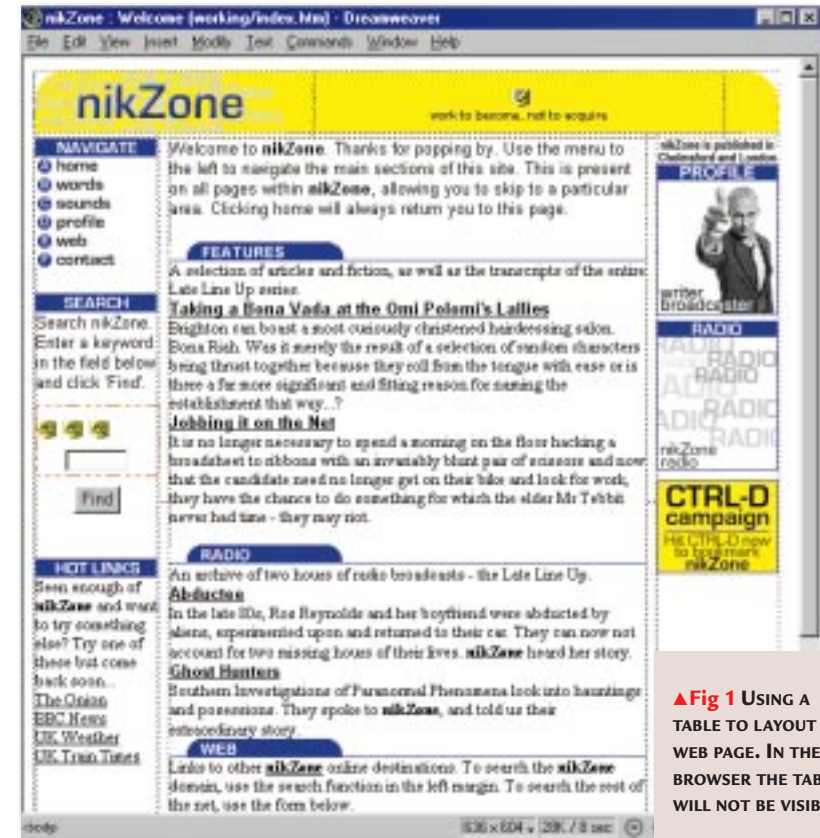
This gives us the freedom to express ourselves in as many different ways as we like without having to worry that the pages we create may have no common theme. This is because the theme is contained within the unchanging menu and header frames. It also dramatically reduces the amount of time we have to spend working on our pages as most of the work need be done only once, referred to in the initial file (usually index.htm). The second workshop in this series took a look at the most basic page elements: text, images and hyperlinks.

In this last part of the series, we'll look at tables and forms. Although neither are a necessary component of a successful site they do provide some useful facilities.

Tables are purely and simply a layout tool. Many professional authoring packages allow the user to drag and drop data from applications such as Excel or 1-2-3, dropping it onto the page as a table. But tables are far more versatile than this: they can incorporate frames, the borders of each cell can be set to a specified width, individual cells can be merged horizontally or vertically and background colours can be specified to match a corporate colour scheme.

Let's take the fairly extreme example of table use in Fig 1. I've loaded the index.htm page from my personal site at www.nikzone.com into Macromedia Dreamweaver 2. Feel free to visit the site to see how the rest of it works and the fact that it looks as though there are no tables on the page.

Tables and forms provide a number of useful facilities



▲ Fig 1 USING A TABLE TO LAYOUT A WEB PAGE. IN THE BROWSER THE TABLE WILL NOT BE VISIBLE

Now look at Fig 1. As you'll see, the whole page is laid out within a very extensive table with a variety of cell sizes, and many cells merge allowing the contents to spill across from one cell to the next.

The reason that the cell boundaries are visible within Dreamweaver yet invisible in the browser is that they have

been set to a width of zero. Although it may not be immediately evident, this function presents us with a useful facility, namely

image slicing, enabling variable compression across a large graphic.

Many graphics packages can slice graphics in a way that will separate areas of consistent colour from details. This allows the solid colours to be more tightly compressed as they will not suffer quite so badly from loss of quality. Lower compression, meanwhile, will be applied to detailed areas to maintain a level of

quality. A table with borders set to a width of zero will then be used to position the sliced sections next to each other to resemble the original image. The net benefit? Significantly faster download times because of an increased average level of compression that it would have been unwise to use on an 'unsliced' image.

■ **Let's create our first table**

We'll use it to act as a menu for the pages that would eventually form the contents of the 'words' section of the site we have been building at <http://i.am/pcw/>.

As it will consist of a list of pages on the left and a brief description of the content of each page on the right, we shall make a two-column table with a new row for each corresponding page. It's a small site and thankfully it is only two rows, which makes the code somewhat easier to examine. See Fig 2.

As you will see, the table is enclosed by <table> and </table> tags. With many

[FIG2]

Making a two-column table

```
<table width="400" border="0" cellspacing="0"
cellpadding="0">
  <tr>
    <td align="left"
    valign="top"><font
    face="Arial, Helvetica, sans-
    serif" size="-1"><a
    href="polari.htm">Polari</a><
    /font></td>
    <td>Polari is an all but forgotten language, but in the
    fifties and sixties it was used extensively and even made
    regular appearances on radio.</td>
  </tr>
  <tr>
    <td align="left"
    valign="top"
    width="100"><font
    face="Arial, Helvetica, sans-
    serif" size="-1"><a
    href="jobbing.htm">Jobbing</a
    ></font></td>
    <td>Looking for a job? Tried all the usual avenues? But
    have you tried the net? More and more companies are
    advertising their jobs online. We find out more...</td>
  </tr>
</table>
```

tags, positioning the closing tag can result in nothing more serious than an extended stretch of formatting; extra bold or underlined words, for example. Incorrect positioning of the closing </table> tag, however, can see your table not just extended but also falling in some rather strange locations on your page, most often at the very top or very foot of the page.

In this example [Fig 2] the <table> tags also tell the browser that the table is to be 400 pixels wide and have invisible borders (**border=0**) that do not interfere with the placement of the text (**cellpadding="0" cellspacing="0"**).

Each row is enclosed within <tr> and </tr>. Once again, it is important to remember to close each row at the end to avoid confusion. Not closing it will cause the browser to append the first cell of the next row to the previous row, extending that row by one cell and creating a ragged right-hand margin where not all rows conclude at the same point.

The cells themselves, in each row, are defined using the <td> and </td> tags. These are very versatile tags which can

contain a number of parameters to define the appearance and behaviour of each cell. For example <td colspan="2"> would, not surprisingly, tell the browser to make this cell two columns wide, which is an easy way of appending a title bar or section break to your table. It can also contain a colour definition. For instance, <td bgcolor="#0000ff"> will generate a dark blue cell using the hexadecimal code for dark blue (see the March issue workshop for a better explanation of colours). This is also the place to detail the alignment of the cell contents. The default positioning for cell contents is to be aligned to the left and positioned exactly half way between the top and bottom borders.

In Fig 2 we have set the vertical alignment of the cells in the left-hand column to the top of the cell using the command **valign="top"** and the horizontal alignment to the left.

The cells of the right-hand column contain more text than those on the left and so the alignment of their contents will not be at the mercy of those to the left. In other words, they will fill all of the space they have been allocated and

therefore it is safe for us to leave their alignment and vertical positioning at the default setting.

Creating a table by hand is often a time consuming and laborious task as at the end of the day the browser is pretty thick when it comes to handling data in this way. You cannot tell it to make all cells in the left-hand column blue, for instance, without telling it that on a cell-by-cell basis. Likewise, you cannot tell it to use a particular font or font size throughout. Again, this must be done on a cell-by-cell basis, hence the level of repetition in Fig 2. Let's simplify matters. Although our table is only two cells wide by two cells deep, the above structure may seem a little confusing. So, ignore everything in the cells above and look at the bare bones structure of the table, which goes something like that shown in Fig 3.

And the moral of the above story? Define your rows, then your columns. Got that? Good. Now let's take a look at forms.

■ **What is a form?**

Doubtless you've visited a web site and been asked to fill in a number of boxes and click 'Submit' to send the details to the owner of the site. What you filled in there was a form.

A form has two main functions: either, as in the above example, for collecting data to be sent back to the site administrator, or for interrogating a database even if that database contains only usernames and passwords so that you can gain access to a particular site.

[FIG3]

The bare bones

```
<table>
  <tr>
    <td>This is row 1,
    column1</td>
    <td>This is row 1, column
    2</td>
  </tr>
  <tr>
    <td>This is row 2, column
    1</td>
    <td>This is
    row 2, column
    2</td>
  </tr>
</table>
```



It would be possible to write a whole chapter on forms but due to space constraints I'm going to have to condense it. As with almost everything

to do with web design, the easiest way to learn is to look at what other people have done and see how the basic principles of their creations can be applied to your own site. To avoid infringing copyright, I'll direct you to my own site at www.nikzone.com (see Fig 4). Click on 'contact' for an example of a very simple



▲ Fig 4 YOU CAN USE SIMPLE FORMS TO GATHER DATA

form. Now view the source code using the option on the 'Edit' or 'View' menu of your browser. You'll be able to spot where the form begins and ends as it is defined by the `<form>` and `</form>` tags. The first of these tags also defines how the browser should handle the data it collects. In this instance, it is using a small Perl application — you'll be able to identify it by the `.pl` extension in the `<form>` definition — to 'POST' the data back to the site administrator's email address. Exactly how you do this will depend on your choice of ISP. Each differs in the way it likes its users to handle forms but most will have comprehensive instructions on the

central web site, or be able to offer advice over the phone.

A form is a collection of elements ranging from text boxes to drop-down lists and radio buttons. Every form, though, has at least one element in common; the 'Submit' button. Many

also host a 'Reset' button that will clear the form should the user make a mistake. The two lines of text in Fig 5 define the submit and reset buttons. As you can see, they require no complex coding because when they are encountered by the browser it merely skips back to the opening `<form>` tag that defined how the form should be handled (in the case of the nikZone site, POSTed) to execute that command.

■ Adding elements

Let's add some more elements to our form. First, we want to know who is sending the data. As this is a general contact form we want to be able to reply to the emails it generates. To capture this data we'll insert a text box for the user to complete.

In the line of code in Fig 6 we define the form element as a text field (`type="text"`) and name it "email". This name could be anything you like as it is merely a way of helping you identify what that line of data means when it arrives in your inbox. On screen, the box will be just 30 characters long (`size="30"`) but it will allow the user to enter up to 75 characters by scrolling horizontally (`maxlength="75"`). All fine and well but what about the message itself? We don't

want our visitors to have to enter this as one long line in a scrolling bar, so instead of using the 'text' input type we opt for the 'textarea' [Fig 7].

Following the logic of the 'text' input type, the 'textarea' line of code should be relatively easy to interpret. A number of subtle changes have occurred, however. 'Size' has become 'cols' and now we have a 'rows' parameter. Together they define this text box to be 45 characters wide and five rows deep. There will therefore be no horizontal scrolling, just vertical movement when the user reaches the bottom of the box. Wrapping has been set to 'VIRTUAL', so as the user reaches the right-hand margin the browser inserts a soft paragraph return which is stripped out before the data is returned to the site administrator. Setting this to 'PHYSICAL' would have put a hard return at the end of each line, and as the lines would never exceed 45 characters in length this would soon become tedious.

Now you have all the elements of your contact form it is a simple matter to arrange them in the order you feel most appropriate for your site. Normal convention is to have the email address first, the text area below it and the submit and reset buttons at the foot, but HTML allows you the freedom to work the way that suits you best.

So that concludes our quick look at web authoring by hand. In the three parts of this series we have only had a chance to look at the very basics of design and implementation. HTML is a simple, powerful and versatile language which because of its plain English format is easy to learn. If you have been following this series and it has inspired you to create a site of your own, do let me know and I'll have a peep. My contact details are below.

[FIG 6]

```
Email address <input type="text" name="email" size="30" maxlength="75">
```

[FIG 7]

```
<textarea name="textfield" cols="45" rows="5" wrap="VIRTUAL"></textarea>
```

[FIG 5]

Submit and reset buttons

```
<input type="submit" name="Submit" value="Submit">
<input type="reset" name="Reset" value="Reset">
```

PCW CONTACTS

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Walk like an encryption

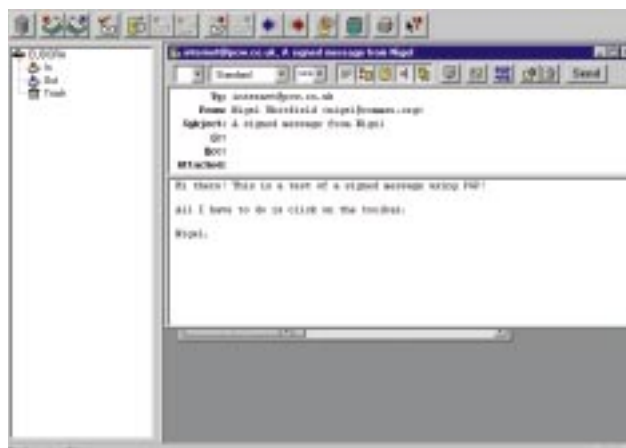
Preserve your **privacy on the net**. Nigel Whitfield shows you how PGP encryption works.

Do you have anything to hide? Of course not, you're innocent. And innocent people never have secrets... or so some would have us believe when it comes to wanting to protect our privacy on the internet. There are plenty of reasons, though, for ordinary people to desire privacy. Survivors of abuse might want to discuss things without fear of being identified, some people may want to share details of their finances with a specific person but not with any 'passerby' who happens to see a message. Others might be planning a surprise, or a change of job.

One of the key tools which can be used to enhance your privacy is encryption; turning information into a scrambled form that needs a password or 'key' to unlock it.

With the usual slightly wonky logic of the lawmakers, though, proposals emanating from the Government had until recently suggested that we would have to put up with a system of 'key escrow'. What that would have meant is that you would have been allowed to use encryption to keep information private but you would have to lodge the encryption key with a trusted agency, who would have been able to hand it over to the police if a court deemed it necessary. It would have been rather like giving a security firm a copy of your house keys in case you might one day be suspected of having committed a crime.

Anyway, good sense now appears to have prevailed partly because of the realisation that real criminals would be unlikely to hand over their keys and also due to pressure from businesses which feared that not being able to encrypt data would make e-commerce slow to take off. Even France, which had banned the personal use of encryption, has now



◀ **Fig 1** PGP PLUGS INTO POPULAR EMAIL PROGRAMS LIKE EUDORA AND OUTLOOK, GIVING YOU BETTER SECURITY

The best place to start with PGP is the documentation that comes with it. But if

relented. So, if the way ahead is clear legally, what does it mean to you?

What can you do with encryption? The first thing to do is visit the PGP International home page at www.pgpi.com, where you'll find links that allow you to download the latest version of Pretty Good Privacy which is one of the most widely-used encryption programs. It uses a system called 'public key cryptography'. For the uninitiated, this means you have two keys: a public key which can be given to everyone, and a private key known only to you.

When a file or message is encrypted with your public key it can only be read with the private key. And, if you send a message to someone else, you can 'sign' it with your private key. Anyone who has the public key can then check that it really was you who sent the message.

Encryption can be much more than just hiding information from prying eyes. You can use it to verify that someone is who they say they are, giving you extra security when you're doing business on the internet.

How do you get started with it? The PGP International web site has freeware programs for Windows and Macintosh users alike, as well as plenty of links to background information for those who want to find out more about the theory behind it.

you're using Eudora, Outlook, Outlook Express or Exchange, you should find it fairly straightforward as there are plug-ins which allow you to access encryption from within the email program [Fig 1]. The days when using encryption meant writing a message, then running it through a program to produce the encrypted version are, thankfully, long gone.

➔ **Step one** after you've installed the program is to click the padlock icon that will appear in your Windows task bar and launch PGP Keys to create a new key for yourself. You'll be walked through the process by a wizard and you'll need a passphrase that you'll be able to easily remember without writing it down, and which other people won't be able to guess. Then the Wizard will generate your private and public key pairs for you and send them to a central server where other people will be able to retrieve them if they wish to look you up.

➔ **Using the system** is simple. With the plug-ins you will see extra buttons appear in your email program providing PGP functions. All you have to do is click on them to provide yourself with a little added security.

For example, the screen in Fig 1 shows Eudora Light. To sign a message, just click the PGP Signature button on the toolbar and choose the Send option. You'll be asked to enter your passphrase and then the message will be signed automatically for you and sent to the recipient. If they know your public key,

Questions & answers

Q On the web, I also have an email account with Yahoo!. How can I view my Yahoo! mail in Outlook Express? I know that there is Accounts on the Tools menu but don't know the server details. Can you help?

a The simple answer to this is 'No'. There are plenty of free email services available on the web but they don't usually offer the access using POP3 which mail programs like Outlook need to be able to pick up messages. Instead, they use dedicated programs running on the mail server, so the only way to access your messages is via a browser. Some services will allow POP3 access as a premium option for which you pay an annual subscription. If you want that flexibility it may be worth looking around for a system which offers this option, and remember that many ISPs are now providing web access to your email anyway, making the need for services like Yahoo! Mail and Hotmail less pressing.

Q I am having to create a web page consisting of a large number of pages, each of which contains text. Is it possible to have a text file or database so that I can

bring up a reference from the file which has text linked to it? Then, I would only have to add a reference of some kind to a script on each page to bring up a paragraph of text.

a Yes, this sort of thing is fairly easy to do. In fact, one of my own web sites consists largely of pages like this which are created on-the-fly and can be accessed by a unique reference number (also see Fig 2). You need to write a script which could be in almost any language, even a batch file on a Windows web server, which takes the name

to your site. By linking to pages with a reference such as

```
<a href="/cgi-bin/  
/getdoc?id=997">Click  
here for document  
997</a>
```

(Key: ✓ code string continues) your script will be passed a query string with the variable id set to 997, and can then open the appropriate file. If you want to make things clever, to avoid doing much HTML coding in files yet still link them, consider writing a script that doesn't just

print out the text files but also looks for

▼ FIG 2 YOU CAN WRITE YOUR OWN SCRIPT TO ACCESS TEXT FILES AND STILL ADD BUTTONS AND LINKS TO PAGES



▼ FIG 3 DATABASE PROGRAMS LIKE FILEMAKER CAN BE HOSTED FOR YOU, SO WITH NO PROGRAMMING IT MAKES PUBLISHING SIMPLE



of a file, opens it and then prints it out with any appropriate HTML tags you want. These could include standard page headers and footers to give a consistent look

they'll be able to verify that it really was sent by you.

Managing an encrypted message is just as simple; all you need to do is click the decode button that is added to

Eudora and it all works in a similar way with other supported email programs. For those that do not, or if you want to encrypt information elsewhere, you can simply copy and paste it to and from the clipboard.

Unfortunately, there is not the space available here for a complete tutorial on using Pretty Good Privacy but if you are concerned about your privacy on the internet, or if you simply want a way in which you can verify the sender of a message, then it is well worth spending the time getting to grips with the system,

even if you only use it in the simplest way. It is still not clear, though, what sort of encryption regulations we will end up with in the UK but in the meantime PGP is free and easy. So, however innocent you are, it can be a useful enhancement to your privacy and security.

PCW internet list

To join other readers of this column in discussions and see at first hand how a mailing list works, send an email to pcw-internet-subscribe@onelist.com or visit www.onelist.com/subscribe.cgi/pcw-internet.

PCW CONTACTS

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The name game

Tim Nott comes up with a VB script for renaming files to run under DOS 6.22.

Readers Bob Jonas has come up with a request which cannot adequately be covered in our Q & A section: 'I want to transfer a large number of files to a laptop running DOS 6.22. Prior to this I would like to copy the files to another directory, rename them with 8 + 3 file names incorporating sequential numbering whilst preserving the original extensions, and print out a list with the old name and the new name.'

Taking the last bit first, we covered something similar in last month's piece on scripting, so I'm going to concentrate on the issue of the actual renaming. The easy way is to get a utility like QuickKeys. Besides its many other talents, the principal being a souped-up, editable version of the old Windows 3.x Recorder, it offers a bulk sequential renaming facility. But are *Hands On* readers devotees of the easy way? I think not. A surprisingly short bit of VBScripting (see Fig 1) will take care of this task, and with rather more versatility.

First, you need to assemble all the files in one folder then run the script. The script prompts for the source folder path. If it can't find this folder it grinds to a halt (I've built in no error-handling, here). Next it prompts for a prefix. If, say, you were to type 'file' here, you'd end up with file0001.doc, file0002.txt, file0003.bmp and so on. This might be especially useful to someone assembling a load of

graphics for a web page. If you were to leave this blank, each copied file would bear the first four letters of the source file, plus the number. For example: docu0001.doc, read0002.txt, pict0003.bmp.

It next prompts for a destination folder, which must be new. If the destination already exists, the script will bail out without copying any files. This is simply a precaution to keep the new files tidily segregated. Note that VBScript doesn't use the \$ character in string handling so the traditional Basic "Left\$()" is just "Left()". One rather awkward problem is that the existing file extensions may contain more or fewer than three characters: for example, .MPEG or .RA. So, in these cases, a simple Right (filename, 4) won't return a dot plus the extension.

We also have to deal with cases where the first part of the filename contains less than four characters. The InStr function gets the position of the dot and if necessary truncates the extension to three characters, while less than three are left as they are. If there are less than four characters to the left of the dot, then the destination filename is adjusted to suit.

It's still not foolproof. It will, for instance, choke on files with no extension at all and it doesn't check the validity of the user-supplied prefix. A little extra code could cure this but we don't have room so this is left as an exercise for the reader.

Another new thing here is the first statement (lines starting with a single-quote are just for information to humans and are ignored by the



▲ Fig 2 INTERNET EXPLORER'S SECRETS REVEALED

scripting host): Option Explicit means that any variables which are used in the script but not declared in the DIM statements will generate an error. Not only is this good programming etiquette but it can also save hours of anguish if you mis-spell a variable somewhere and wonder why the script isn't working.

For those who cannot be bothered to type all this you'll find the file in the Hands On section of this month's cover CD as Bulk Rename.vbs. As always, this CD is supplied without guarantee and neither the author nor the publishers are liable for anything you may get up to by using it. So, back up, check your insurance and say a prayer before use.

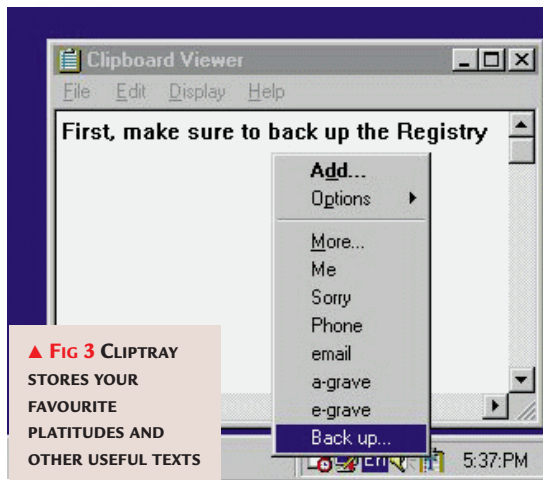
One particular warning: never attempt to copy large numbers of files to the root of a drive (e.g. C:\), as this can cause file system problems.

■ Diversions ahead

Two readers have come up with obscure time-wasters this month.

➔ **First**, Neil Shepherd: 'In the unlikely event that your machine running Win98 does not crash, you can recreate illegal operations at your leisure by making a shortcut to: C:\windows\rundll32.exe user.exe,BozosLiveHere.' Well, thanks Neil. Just what we've always wanted!

➔ **Second**, Alex Pounds sent in the key to the Internet Explorer 4 'Easter egg' or gang screen [Fig 2]. 'Open up IE4 and go to Help, About Internet Explorer. Ctrl + drag the e in the top right corner and waggle it around the left edge of the



▲ Fig 3 CLIPTRAY STORES YOUR FAVOURITE PLATTITUDES AND OTHER USEFUL TEXTS

[FIG 1]

RENAMING AND TRANSFERRING FILES

This VB script prompts for a source folder and a destination folder it then copies each file in the source to the target, renaming each in a numeric sequence. Script cobbled together by Tim Nott, 1999.

'Declaring variables

```
Option Explicit
Dim sourcefolder, targetfolder, count, allfiles, tail
Dim indir, outdir, prefix, newname, eachfile, abort
Dim dotpos, extension, filecopy, myobject, myobject2
```

'Prompt for source and destination folders

```
indir=InputBox("Enter the path to the source folder")
prefix = InputBox ("Enter the prefix for the new files - maximum four characters. Leave blank to use the first four characters of the source files")
outdir = InputBox ("Enter the path to the new destination folder")
```

```
If outdir <> "" Then
    Set myobject2 = CreateObject( "Scripting.FileSystemObject" )
    If Not myobject2.FolderExists( outdir ) Then
        myobject2.CreateFolder outdir
        abort = False
    Else
        MsgBox "Folder already exists - script will end", 0, "Cannot create folder"
        abort = True
    End If
    Set myobject2 = Nothing
End If
```

'Call the function unless the destination folder already existed

```
If abort = False then filecopy=DoCopy(indir, outdir, prefix)
```

'Function to copy files

```
Function DoCopy(sourcespec, destspec, head)
    count = 0
    Set myobject = CreateObject("Scripting.FileSystemObject")
    Set sourcefolder = myobject.GetFolder(sourcespec)
    Set targetfolder = myobject.GetFolder(destspec)
    Set allfiles = sourcefolder.Files
    For Each eachfile in allfiles
        count = count + 1
        tail = right("000" & count, 4)
        dotpos = InStr(eachfile.name, ".")
        extension = Mid(eachfile.name, dotpos, 4)
        If head <> "" Then
            newname = head & tail & extension
        ElseIf dotpos > 4 Then
            newname = Left(eachfile.name, 4) & tail & extension
        Else
            newname = Left(eachfile.name, dotpos-1) & tail & extension
        End If
        myobject.CopyFile sourcefolder & "\" & eachfile.name, targetfolder & "\" & newname,
    True
    Next
End Function
```

“Microsoft Internet Explorer 4.0” text, which should then move aside to reveal an “Unlock” button. Drop the e and click it. The globe on the left will start to shake. Ctrl + drag the e onto it. A new window will appear showing the names of the IE4 team.’

■ The Cliptray utility

Buried in the Windows 98 Resource Kit is a useful utility called Cliptray [Fig 3] that I happened on all by myself. When run, it sits in the System Tray at the right of the Taskbar, displaying a clipboard icon. Right-click on this and select Add. You'll

then get a box with a space for a name and some text. Type in some text you often use, like your name and address. Repeat and you'll find that subsequent right-clicks show a menu of the names you gave to the texts. Select one and it's copied to the clipboard, ready to paste



Questions & answers

Q For some reason the titles of some of my Windows 98 Desktop icons are truncated. How can I cure this?
GREG KINGSLEY

a You should find that selecting each icon reveals the full text. For an overall solution try going to Control Panel, Display, Appearance and increasing the horizontal and/or vertical icon spacing from the 'Item' list. Click on 'Apply' then right-click on the Desktop and Arrange Icons to update the results.

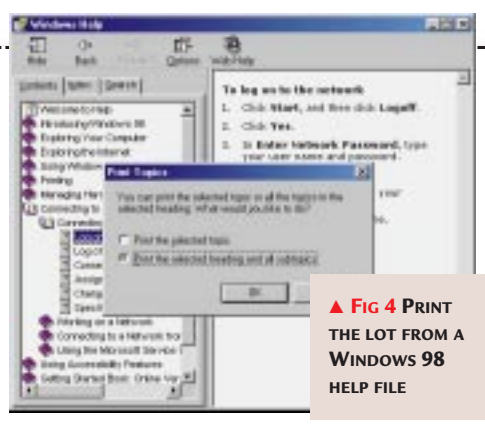
Q Recently, when I right-click on the Start button, the Open and Explore options are greyed out. Any idea why, or how to restore them?
DILLY KEEGAN

a This seems to be a common problem and one which has had me baffled for some time. There are two things you can try, according to usually reliable sources. Both need TweakUI installed. First, check that you are not hiding any drives in the My Computer tab. Second, check that the path to the Start Menu folder is shown correctly in the Special Folders list in the General tab.

Q I cannot seem to get individual Control Panel property pages (e.g. Multimedia) to appear on the Taskbar when opened. It's annoying when experimenting with settings to have to minimise all the windows 'on top' to get at it.
GREGORY HOLDEN

a This is one of my pet annoyances, too. You can get it back into focus by re-summoning it from Control Panel but a smarter solution is to hold down Alt + Tab. A small window will appear showing icons for each open folder or program. Hold the Alt key and tap the Tab key until the relevant icon is highlighted, then release both keys.

Q With regard to your item in the March column concerning the 'phantom phone menace', I seem to be suffering some of the symptoms you describe, having installed RealPlayer G2. Specifically, the prompt to disconnect the connection when I close my browser no longer appears. Can you tell me how to re-enable it?
STEVE DODMAN



▲ FIG 4 PRINT THE LOT FROM A WINDOWS 98 HELP FILE

word processor document. The Windows 98 .CHM (compiled HTML) help files do have the facility to print either the selected topic or the selected heading and all subtopics [Fig 4]. You'll find this by choosing 'Print...' in the Options menu.

Q I have a new PC running Win98, and an older laptop running Windows 3.11. How can I connect them so that I can upgrade the laptop to Windows 98 as well?
MIKE EDMONTON

a Technically, you can do this with commercial software like Laplink. Or, if you want to do it the hard but free way, there is MS-DOS Interlink and InterServer which come with MS-DOS 6 and Win95. I won't go into detail as the relevant DOS help files provide instructions but I've used this in the past to transfer files between a Win3.1 laptop and a Win98 desktop. However, I should point out that your Win98 licence only permits you to install it on one computer at any one time, so upgrading your laptop in the way you describe is in breach of your licence and is illegal. You should find a file named LICENCE.TXT in the Windows folder of the Win98 machine which spells out the gory details.

a Some permutations of Windows/Internet Explorer have a check box for this buried somewhere in the DUN settings. Some don't, which is the sort of thing that makes supporting Windows such a rich and challenging experience. If you don't have the checkbox, back up the Registry then run Regedit. Go to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Internet Settings and find the EnableAutodisconnect key. Change the data value to 01 00 00 00. Quit Regedit and restart your computer.

Q Is there a method of printing a whole help file without having to visit every topic and print them one by one?
GAVIN BENSON

a For standard .HLP files, the answer is 'no'. Your best bet would be to copy and paste each topic into a single

into any text-input situation. Now I can write things like 'First, make sure to back up the Registry', and other well-worn phrases, with a few mouse-clicks even when writing my column in Notepad. Although you may be able to wrinkle out the files necessary to install this on its own, the standard installation routine copies most of the Windows Resource Kit to your hard disk. But it is only 10Mb and there is some useful stuff there, including the indispensable TweakUI. Open up the tools\reskit folder on the Windows 98

CD-ROM and you will find a Readme.doc and a Setup.exe.

■ **Updates tip**
Following the long-running saga in recent Hands On Windows columns, of getting hold of Windows updates as downloadable files rather than on-line updates, reader Peter Ball recently contacted me to point out that Microsoft does now provide a site for just this, at www.microsoft.com/windows98/downloads/corporate.asp.

Meanwhile, users of other versions of Windows will be able to find updates at its web site at microsoft.com/windows/downloads/default.asp.

PCW CONTACTS

Tim Nott welcomes your feedback on the Windows column. He can be contacted via the PCW editorial office (address, p14) or email win@pcw.co.uk
QuickKeys www.quickkeys.com



Command and conquer

Be a **macro man**. Roger Gann makes use of a powerful DOSKEY feature.

I guess many readers will be familiar with the DOSKEY utility; a little goodie which surfaced with MS-DOS 5.0. It's a memory-resident utility that's a command stacker and macro generator. By default, DOSKEY is set up to record about 35 of the most recently-typed commands but you can increase its storage capacity by changing the buffer size and the commands can be recalled via the cursor keys, which is very useful. However, I guess that while most readers are familiar with DOSKEY's command-stacking capabilities, only a few will be familiar with its macro capabilities which is a shame as this is a very powerful feature and a real time saver.

➔ **There are two ways** in which you can enable DOSKEY. One is to type DOSKEY at the command prompt. The other is to add a line to your AUTOEXEC.BAT file, which reads:
`c:\dos\doskey`

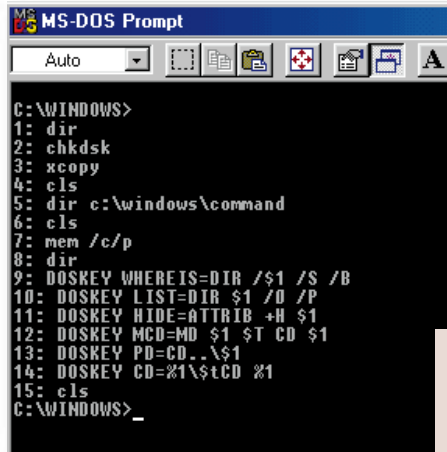
If you use a 386- or 486-based PC and want to load DOSKEY into upper memory, type instead:

`loadhigh c:\dos\doskey`

When you first load DOSKEY, it has a buffer size of 512 bytes, with the entire program taking up a mere 4Kb of memory. So, if you do have a 386 or 486, load DOSKEY into upper memory to avoid wasting conventional memory, then expand the buffer to 1Kb, as described below, (it still only takes up 5.5Kb of upper memory) with no loss of conventional memory.

➔ **Most basically**, DOSKEY allows you to easily recall previous command line entries via the cursor keys. It's a bit like the F3 key which lets you recall the previous command, but this is much better; with DOSKEY, you can hit F7 to select from a list of commands you used in the current session [Fig 1].

There are many ways to recall commands stored in the DOSKEY buffer. Besides pressing the up arrow key to get the previous command, you can use the down arrow key to find the next. Additionally, pressing Page Up or Page Down recalls the oldest or newest



Unlike the size of a batch file, a macro's size is restricted by the maximum length of the command line (127 characters). However, a macro runs much faster than a batch file because DOS doesn't have to pause to load the macro from disk before executing it. In fact, macros behave almost exactly like internal DOS commands. If you give

◀ **Fig 1** WITH DOSKEY LOADED, PRESSING THE F7 KEY BRINGS UP A LIST OF YOUR PREVIOUSLY ENTERED COMMANDS

command, respectively. Once you have recalled the appropriate one, use your left or right cursor keys to move one character at a time and edit any line as you see fit.

The Home and End keys move to the beginning or end of the line. Pressing ESC clears the line, CTRL-left-cursor key moves to the previous word, while CTRL-right cursor moves to the next.

Even better, DOSKEY actually enables you to compose your own custom DOS commands using its macro feature — and DOSKEY is so good that you will want to store plenty of macros. However, its default buffer size of 512 bytes is just not sufficiently large to hold lots of macros so you should install it with a 1Kb buffer size by typing the following command:

`DOSKEY /BUFSIZE=1024 <CR>`

➔ **Creating a macro** with DOSKEY is simple. Just type DOSKEY followed by the macro name, an equal sign and the command(s) to be assigned. You can include more than one command by separating individual commands with the character \$T. The symbols \$1 and \$2 are like the replaceable parameters %1 and %2 in batch files.

DOSKEY substitutes the parameters that you enter on the command line for the replaceable parameters in the macro. It also supports the replaceable parameter \$*, which is equivalent to everything entered on the command line after the macro name.

a macro the same name as a built-in command such as DIR or CLS, the macro runs when you type the command at a prompt.

➔ **You can combine** commands in a DOSKEY macro by separating each with a \$T. For example, if you use a hard disk partitioned into six logical drives you could create a macro called CHECKALL which checks and fixes all six drives. The DOSKEY macro would appear as:
`doskey checkall=chkdsk c:/f ✓
$t chkdsk d:/f $t chkdsk e: ✓
/f $t chkdsk f:/f
(✓ Code string continues).`

To run the macro, type checkall, and it will check and fix the drives C: to F:.

DOSKEY macros are powerful and fast but unless you save them to a file, they are only temporary. That is, they only work until the buffer fills up, or you load Windows, or you reboot. If you only have a few macros just add them to your AUTOEXEC.BAT file. If you have several, though, you may wish to store them all in a batch file and load them on demand.

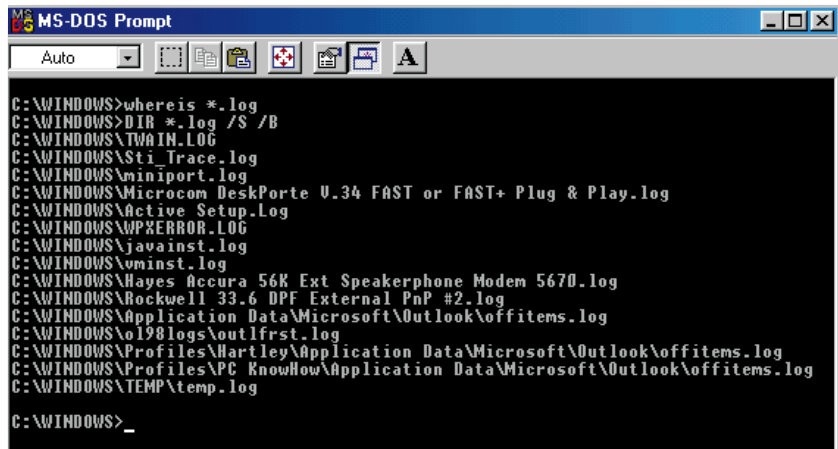
➔ **Here's an easy way** to save all your macros in a batch file. Type:
`doskey /m>macros.bat`
By itself, DOSKEY/M will list all DOSKEY macros on your screen Fig 2. Adding the redirection symbol, >, will redirect output to a text file called MACROS.BAT.

Next, load the file MACROS.BAT into a text editor such as EDIT and edit each command line to commence with the

Networks

word DOSKEY. You can then 'call' MACROS.BAT from your AUTOEXEC.BAT file. DOSKEY understands the following special metacharacters in macro definitions:

- \$B Piping operator (|)
- \$G Output redirection operator (>)
- \$G\$G Output redirection append operator (>>)
- \$L Input redirection operator (<).
- \$T Command separator, CTRL-T (^)
- \$\$ Dollar sign
- \$1 to \$9 Replaceable parameters 1 through 9
- \$* All command-line parameters.



▲ FIG 4 A MACRO IN ACTION. THE WHEREIS MACRO LISTS EVERY OCCURRENCE OF A FILE

actually run CHKDSK/F. Anyway, Fig 3 lists some example macros you might like to try out. In all cases, the actual 'new' DOS command we've created is the word following DOSKEY. Use the new commands as you would an ordinary DOS command: for example,

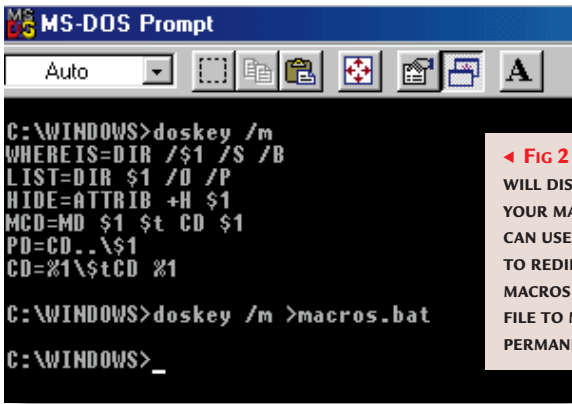
macro still changes to the correct directory. If you type a space before this or any other DOSKEY macro which replaces a DOS command, you get the old command rather than the macro.

[FIG 3] Try these macros

- **Change** to a parallel directory:
DOSKEY PD=CD.. \ \$1
- **Copy** a file to the printer:
DOSKEY FP=COPY \$1 PRN
- **Count** the number of files:
DOSKEY FILES=CHKDSK \$1 \$B FIND "files"
- **Delete** files so they can be easily recovered from a 'trash' directory:
DOSKEY DEL=COPY \$1 C:\TRASH \$T DEL \$1
- **Delete** multiple files:
DOSKEY MDEL=FOR %%F IN (\$*) DO DEL %%F
- **Delete** system files:
DOSKEY ZAP=ATTRIB -H -S -R \$1 \$T DEL \$1
- **Display** a sorted, paged DIR:
DOSKEY LIST=DIR \$1 /O /P
- **Hide** files:
DOSKEY HIDE=ATTRIB +H \$1
- **Unhide** files:
DOSKEY UNHIDE=ATTRIB -H \$1
- **Make** and then change to that directory:
DOSKEY MCD=MD \$1 \$T CD \$1
- **Move** a file:
DOSKEY moveit=copy \$1 \$2 \$t del \$1
- **Search** for a file:
DOSKEY WHEREIS=DIR \$1 /S /B

← **The capabilities of DOSKEY** are almost limitless and are dependent largely on your batch-programming skills. Most of the time you can use it to simplify wordy DOS commands. For instance, DoubleSpace /Mount could be abbreviated to DSM or you could redefine CHKDSK so that typing it would

DOSKEY CD=%1\ \$tCD %1
This DOSKEY macro, which replaces the regular CD command, changes drive and directory automatically. When you use it with a relative path name (CD SYSTEM, for instance, when the current directory is C:\Windows), you get a Bad Command or File Name message but the



◀ FIG 2 DOSKEY/M WILL DISPLAY A LIST OF YOUR MACROS. YOU CAN USE THIS FEATURE TO REDIRECT THE MACROS TO A BATCH FILE TO MAKE THEM PERMANENT

WHEREIS AUTOEXEC.* will search your hard disk for all files that start AUTOEXEC Fig 4.

← **DOSKEY is useful** under Windows 98, too. To save yourself the hassle of having to run it manually each time you open a DOS session, right-click

← **A final tip**
DOSKEY insists that you type DOSKEY /MACROS to get a list of macros but, as we have seen in the past, it is no big deal to reassign function keys. So, it is a piece of cake to get the F10 key to do this for us. With the ANSI.SYS device driver loaded, just enter the following command, either in your AUTOEXEC.BAT file or at a command prompt:
PROMPT \$E0;68;"DOSKEY /
MACROS";13p
(Key: ↵ code string continues).

PCW CONTACTS
Roger Gann welcomes your comments about the 16-bit column. He can be contacted via the PCW editorial office (address, p14) or email 16bit@pcw.co.uk

Free and easy

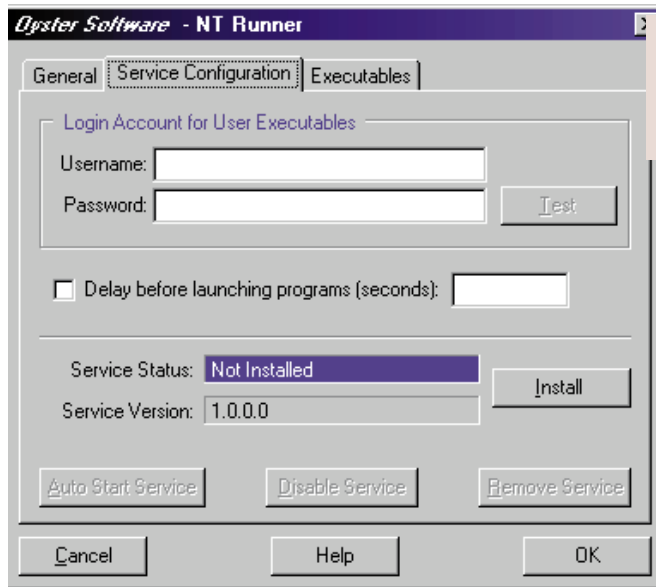
Andrew Ward finds NTRunner is a goer when running **programs as services**.

I'm going to return to the subject of running executable programs as services under Windows NT. Reader

Darren Davis writes in to object that SRVANY is fiddly to use. I agree with him. And, he's found a more pleasant solution, in the guise of NTRunner. It's obtainable from www.istare.com, and what's more, it's freeware.

For NTRunner to work, you don't need to run a Setup program; just unzip the file you download. But before it can do anything, NTRunner has to have its corresponding service installed. This is easy — it's just a question of clicking the Install button in the Service Configuration tab [Fig 1]. The service is set to Automatic start by default but you can disable it if you wish.

Adding executables is easy enough, by clicking on Add in the Executables page [Fig 2] and navigating to the program file. You can specify whether the program should start up Maximised, Minimised or Hidden, although not all programs will take notice. To ensure you've set everything up correctly, you can click on the Test button which is quicker and easier than waiting for the system to restart.



◀ Fig 1 INSTALLING THE NTRUNNER SERVICE IS MERELY A MATTER OF CLICKING ON INSTALL

web site, or obtain the CD itself from Microsoft for a nominal charge (phone 0345 002000). Even though not everyone has installed Service Pack 4 for Windows NT yet, there are already a number of hotfixes to solve problems which have come to light since its release. These may be downloaded via anonymous FTP from <ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postSP4/>.

Programs installed to run as services will begin executing as soon as the system starts up, but where you would expect them to interact with the desktop you won't actually see them until a user logs on. Similarly, when the user logs off, the programs stay running in the background but without a user interface. Program termination will occur on a system shutdown if explicitly shut down by the user, or automatically if they are designed to do that. Actually, You can specify an optional delay before the programs start

up. This is necessary to ensure that all required NT services have started up before the program attempts to run. Similarly, you have probably noticed that it helps to wait a couple of minutes after the logon screen appears before you actually log on.

Hotfixes

Service Pack 4 has featured on our cover-mounted CD but for reasons of space we have been unable to include all versions. You can download the service pack from Microsoft's

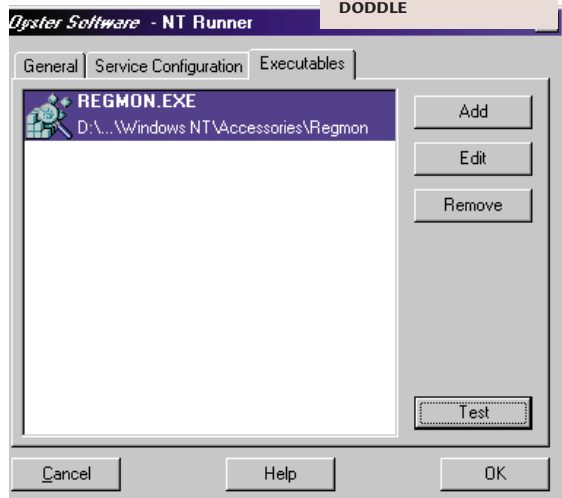
The problems solved by the various hotfixes range from important security issues to others that are extremely trivial. For example, someone with access to the console of an NT workstation, where a user is currently logged on and the console is locked, can retrieve the first line of text from a logged-on user's clipboard.

You were able to do this by using the keyboard shortcut for paste (Ctrl-V) in the User field of the Unlock Workstation dialogue box. Potentially, it was a minor security risk. But no more.

Another problem solved is that of NT incorrectly identifying the ATAPI version of the Iomega Clik 40! drive as a floppy drive, and then assigning it the first available floppy disk drive letter (usually the letter B).

Rather more important than either of those two, however, is a slowdown in performance, followed potentially by a hang caused by a malicious attack. Specifically, these are attacks on RPCs (remote procedure calls) within NT using named pipes — they create multiple named pipe connections to a Windows NT system and send random data. The RPC service then attempts to send a response and close each connection, resulting in 100 percent CPU usage.

▼ Fig 2 ADDING EXECUTABLES TO BE RUN AS SERVICES IS A DODDLE





hands on windows nt

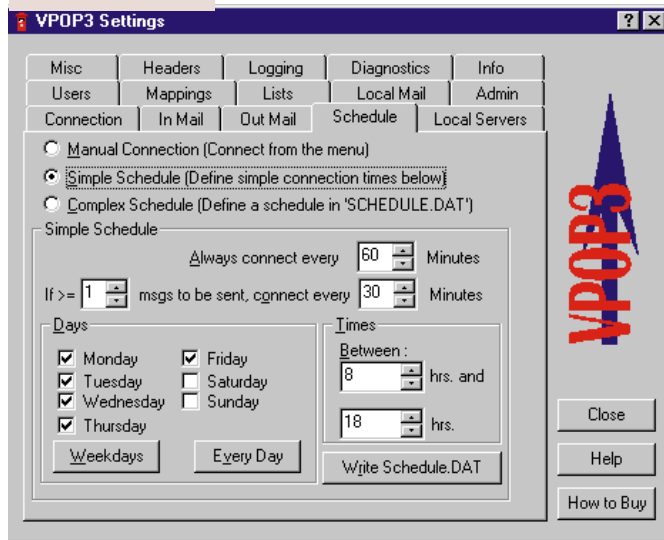
Mail servers

Reader Peter Holloway suggests that VPOP3 [Fig 3] is a mail server worth consideration as an alternative to NTMail. It's downloadable from www.pscs.co.uk and in Peter's view, with which I agree, it's a lot easier to set up.

Like other programs of this ilk, it hosts its own POP3 mailboxes for users on your local network and will fetch mail from ISP accounts to put into these boxes. Thus, if all the mail for the domain award.co.uk goes to one ISP POP3 mailbox, for instance, VPOP3 will retrieve it all and distribute it among the appropriate users' mailboxes. Outgoing mail is stored by VPOP3 and then sent when it next connects.

The mail retrieval operation can be scheduled to occur at specific times and it can be optionally triggered by the action of sending a message with the priority set to Urgent. For example, if you

▼ Fig 3 COMPLEX DIALUP SCHEDULES CAN BE CONFIGURED FOR VPOP3



expecting something urgent and want to check incoming mail, it's possible to trigger a connection by creating a file with a specific name in the VPOP3 directory. You could set up a simple batch file and an associated icon on people's desktops to do this.

There is now also a new version, 4.2, of NTMail [Fig 4]. The

main difference is an updated user interface, following representations from certain vocal users. But NTMail remains a fiddle to configure. It's especially difficult if you have a dial-on-demand router. With one of these, you have to set up NTMail for dialup networking to stop it bringing up the router incessantly. Unfortunately, unless you also install RAS and enter a phonebook number, NTMail won't allow you to configure scheduling. I prefer MDaemon.

Watch out, there's an offer about

If you're keen to get started with Windows NT and development, there's an offer from Microsoft that may interest you, but be sure to read the small print. It works like this: if you buy Visual Studio 6 Enterprise Edition it includes a copy of BackOffice Server 4.5. And BackOffice Server 4.5 includes a

copy of Microsoft Windows NT Server 4.0 with Service Pack 4 (see the box

Included in BackOffice Server 4.5

- NT Server 4.0 with Service Pack 4
- NT Option Pack, with Internet Information Server, Transaction Server, and Message Queue Server
- SQL Server 7.0
- Proxy Server 2.0
- Site Server 3.0 with Service Pack 2
- Systems Management Server 2.0
- SNA Server 4.0a
- Internet Explorer 5.0
- FrontPage 2000 (single user)
- Visual InterDev 6.0 (single user)
- Outlook 2000 (for use by licensed client systems)
- Seagate Crystal Info 6.0 (five users)



▲ Fig 4 A MUCH NICER USER INTERFACE FOR NTMAIL VERSION 4.2

below for a list of included products).

In theory, then, you can buy a new blank PC and a copy of Visual Studio 6 EE and be fully equipped with all the software you need to develop and test Windows NT BackOffice applications. But there's a catch. At the time of writing, you didn't really get a copy of BackOffice Server 4.5 — you got a card to send off. This is made clear enough on Microsoft's web site: 'Sent via fulfillment (*sic*) (see voucher in box) as soon as product is available', it says. All well and good, and by the time you read this the product will be available, but that didn't help those who had to wait a couple of months for it before they could install an operating system and start work.

And neither is that the only catch. To complete the fulfilment card you need to provide a Visual Studio registration number. And how do you find out the registration number? By installing and running Visual Studio on your non-existent operating system installation!

So, what you would have to do is to

either borrow a copy of NT Server from someone else (under the circumstances, Microsoft wouldn't dare have the cheek to complain), or obtain the 120-day evaluation CD from Microsoft.

Visual Studio 6 Enterprise Edition (see the box on p212) is



hands on windows nt

available from Grey Matter at www.greymatter.co.uk and other software retailers for a cost of around £1,316 (inc VAT).

■ Diskeeper update

Those of you who use Executive Software's Diskeeper to keep your hard drives defragmented may like to know that there's an upgrade from version 4.0 to 4.1 available. This corrects a number of important potential problems, three of which are listed below. Other changes are more cosmetic, although nevertheless important. The upgrade can be downloaded from www.execsoft.co.uk. Look for the 4.1.202 Free Upgrade.

1 **Corrections** have been made to the boot-time module to prevent possibilities of data corruption under certain circumstances.

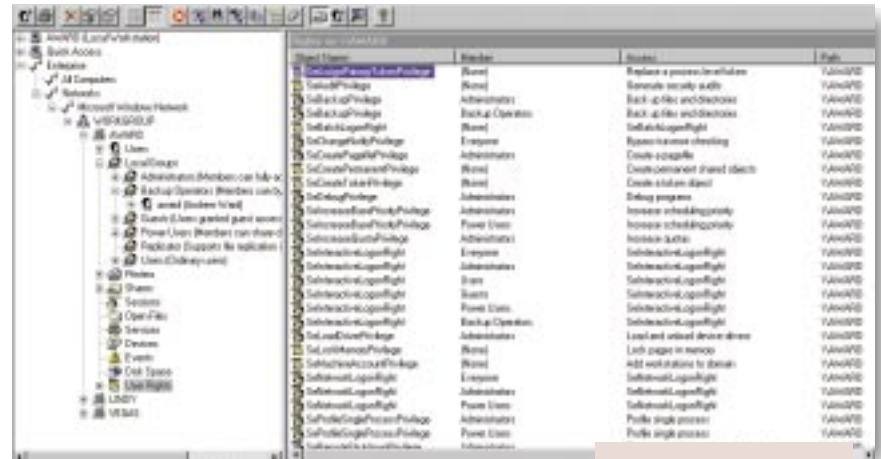
2 **This version** incorporates changes in both NTFS boot-time online engines to properly handle certain varieties of extremely fragmented files and directories.

3 **A number** of access violation problems have been corrected in the Diskeeper FAT and NTFS online analysis and defragmentation engines in this version.

■ Happy with Hyena

The debate about the most effective management tool for NT 4.0 shows no sign of receding and I particularly like one tool, Hyena, drawn to my attention by a PCW reader. Hyena is available from www.adkins-resource.com and offers you a single point to manage practically every aspect of a Windows NT machine or domain [Fig 5].

Within an Explorer-style view, you can see all machines and domains on the network (or those you choose to



► **FIG 5** A CONVENIENT WAY TO MANAGE YOUR WINDOWS NT SYSTEMS

include), and for each Windows NT system you can manage users, groups, printers, shares, sessions, open files, services, devices, events, disk space and user rights.

Hyena is extremely thorough. You can view and modify such things as obscure user rights that you would otherwise have to set via the registry. And, as well as viewing open sessions on a system, you can send messages to connected users before you disconnect them — a nice touch as this saves you having to do it by some other means such as using NET SEND. In the Services screen, Hyena shows not only all the usual stuff that's accessible via that Control Panel but also any service dependencies.

By right-clicking on a computer name you can also set the Account Policies and Audit Policies. You can find out how long a system has been up, and shut it down (remotely). Overall, it's difficult to find much that Hyena won't do. In one single place, it combines administrative tasks that you would otherwise undertake from the Control Panel, Windows NT Explorer and a variety of utilities located

within the Administrative Tools program menu and the Resource Kit.

Additionally, Hyena tackles many of the challenges of user administration. User names can be renamed *in situ*. Users, groups, printers and computers

can be exported wholesale

and any combination of users can be modified simultaneously.

First, you select multiple users with the mouse and shift key (or control key) as is normal with a list. Then, modifications you carry out to the properties will take place over all selected users. There does not, however, appear to be any way to set up multiple user accounts by importing user name data from an external source.

To make life easier when scheduling remote jobs, Hyena even acts as a front-end to the Windows NT AT service. Shares can be navigated and files copied and deleted without you having to map drives to them.

By adding Custom Tools you can include other applications such as the Performance Monitor, ping or tracert under Hyena's Tools menu to make them quickly accessible. And to quickly go to computers and printers that you frequently need to administer without having to navigate through the Explorer-style tree each time, you can add them to a Quick Access object.

A trial version of Hyena may be downloaded from the Adkins Resource web site and you can purchase it there for \$199 — the organisation will email you a registration key. If you do not mind paying £150 for it, you can buy it from UK resellers such as www.giant-technologies.com.

PCW CONTACTS

Andrew Ward welcomes your comments on the Windows NT column. He can be contacted via the PCW editorial office (address, p14) or email NT@pcw.co.uk

Visual Studio 6 Enterprise Edition

- Visual Basic 6.0 Development System
- Visual C++ 6.0 Development System
- Visual J++ 6.0 Development System
- Visual InterDev 6.0 Development System
- Visual FoxPro 6.0 Database Development System
- BackOffice Server 4.5 Dev. Edit.
- Visual Modeler 2.0
- Visual Studio Analyser
- ActiveX Data Object 2.0 (ADO)
- Oracle and SQL Server Database Designer
- Visual Database Tools
- Distributed Web Project Model
- Visual SourceSafe 6.0
- Microsoft Repository 2.0
- Visual Component Manager 2.0



Under the counter

Mark Whitehorn shows how to cater for **counters** and fix up **functions**.

Several strings have been weaving their way through this column and last month I dealt with connections between PDAs and the internet. This month, I will take up the thread on programming.

I ended the April column on a low note: in fact, a whole series of low notes and the Psion was well on its way to playing the 'Flight of the Bumble Bee'. If you've experimented with altering the value for the Pitch% variable with a Do...Until loop to make multiple beeps, you may be wondering if there's an easy way of finding out how many beeps it made in total. Yes there is a way and it's a useful concept, too.

Add the following elements (shown in red) to the basic program:

```
PROC Penguin :
Local Pitch%, Counter%
Pitch% = 500
Counter% = 1
Do
Print Pitch%, Counter%
BEEP 1, Pitch%
Pitch% = Pitch% + 20
Counter% = Counter% + 1
Until Pitch% > 600
Pause 50
ENDP
```

A new variable, Counter%, has been declared and set to a value of 1. When the Do...Until loop starts, the current value of Pitch% (500) and of Counter% (1) are printed to the screen. The program continues through the loop causing a 500-pitch beep, increasing the Pitch% value by 20 to 520 and the Counter% value by 1.

The loop repeats, printing the current values in the variables which are 520 and 2 respectively. When the value of Print% exceeds 600 the program stops and shown on-screen is the number of times a beep was sounded. A refinement would be to edit the Print line to:

```
Print Pitch%, "There were", Counter%, "beeps."
```

(Key: ✓ code string continues)

Counters can be seriously useful in programming, either to tell you how many times something has happened or

to control how many times something *should* happen. In the latter case, the last Until line of a program might read:

```
Until Counter% = 25
```

Adding the printing feature to the program makes it run more slowly than before. Curious to know how much slower it was, I decided to run the program again without the printing.

Programming is full of situations like this.

Essentially, I want the program to ignore the line of code that initiates the printing so that I can see how the program runs without it. The inefficient way to do this is to delete the line in question, which is less than ideal because you'll probably want to put it back later. The efficient way is to make it a REM statement.

A REM statement starts with the 'word' REM — any line of code starting like this is interpreted by the program as a REMark for humans to read and not to be carried out by the computer. Editing the Print line to read

```
REM Print Pitch%, "There were", Counter%, "beeps."
```

(Key: ✓ code string continues)

has the effect of stopping the print operation. Running the program again reveals that it runs much faster. This is not too surprising a result: printing to the screen is known to be, in many programming languages, a time-consuming operation (as are most input/output operations). To restore the printing function, simply delete REM from the start of the line.

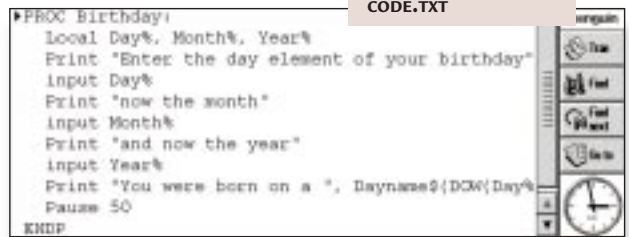
■ Introducing functions

On which day of the week does your birthday fall this year?... and in the year 2000?... and in ten years time? What we need is a program to answer this important question [Fig 1], so this project introduces functions.

A function is a pre-defined piece of code which when activated during a program returns a numerical value. I'll use two of the functions built in to OPL: DOW (standing for Day Of the Week)

and DayName\$. DOW takes in three numbers and generates one number

▼ Fig 1 THE BIRTHDAY PROGRAM: ALL THE PROGRAM SNIPPETS ARE ON OUR COVER CD IN A FILE CALLED CODE.TXT



from those. For example, if you feed DOW with 10, 12 and 1997, it will give you 3 and if you give it 14, 2, 1999, it returns 7.

➔ **A simple** program will test this:

```
PROC DOWtest :
Print DOW(10,12,1997)
Pause 50
ENDP
```

Changing the numbers will probably generate a different answer but that answer will always be between 1 and 7 and it should come as no surprise that these equate to the days of the week; so 1 maps to Monday, 2 to Tuesday etc.

These numerical values are not ideal, though. What if the users of your program think that Sunday is the first day of the week and are therefore convinced that your program didn't work? Some means of converting the number to a text string is required and for this we turn to the DayName\$ function.

➔ **This one** you can test with the following program:

```
PROC DNtest :
Print DayName$(3)
Pause 50
ENDP
```

➔ **You could** also use a variable as a counter (as described above) to run through the available options:

```
PROC DNTest :
Local Count%
Count% = 0
Do
Count% = Count% + 1
Print DayName$(Count%)
Pause 10
Until Count% = 7
ENDP
```

GAME ON FOR THE 5

Good news for Defender fans. As you may recall from the March column, I reviewed De3ender, the excellent Defender clone game that runs on the Psion 3a, C and 3MX — just in case you missed it, it's on our cover-mounted CD again this month. I received an email from De3ender's author, Mark Wheadon, who says he's working on a version for the Series 5.

When he mailed me, he'd just run some tests to check the frame rate, amongst other things, and told me the results 'are very encouraging and the Series 5 version is going to be seriously smooth and responsive'. Mark says he'll let me know as soon as it's ready to roll but the impatient should keep an eye on his web site at i.am/MarkSoft. Mark is also



responsible for two games (the Defender clone) and for the Siena: Siender (Patsiena (Patience)).

```
Enter the day element of your birthday
23
now the month
2
and now the year
1998
You were born on a Mon
```

```
Enter the day element of your birthday
23
now the month
34
and now the year
1998
You were born on a

Information
Error in BIRTHDAY\BIRTHDAY
Invalid arguments
Continue
```

```
h%, Year%
day element of your birthday"
onth'
be year'
born on a ", Dayname$(DOW(Day%,Month%,Year%))
Invalid
```

◀ FIG 2 THE PROGRAM RUNS!

▼ FIG 3 (MIDDLE) THE PROGRAM BOMBS...

▼ FIG 4 (BOTTOM) ...AND OPL TRIES TO HELP

program. The function DOW is given three figures and from those it calculates the day number, which is 3. That number 3 could be placed into a variable for later use but instead I've put the DOW function inside brackets that follow the DayName\$ function.

DayName\$ expects to receive a number and this is what it gets from the DOW function. In other words, DOW works with the figures

it's given to produce a number and that number is then used by the preceding DayName\$ function. This short and sweet solution forms the core of the birthday program.

➔ **Until now**, the example programs have been for use by you, the programmer and whenever you've wanted to try something different, you have edited the code and run it again. The birthday worker-outer, however, is different in that you may wish to give it a user interface so others can use it. In

order to work, the program must be able to take input from the user and incorporate it. The OPL command for this is INPUT. This halts the program, waits for typed input from the user, puts that input into a variable and then sets the program running again.

Users will need to enter a day, a month and a year, so three variables are needed for these pieces of information: in this example they are Day%, Month% and Year%. INPUT is called on three times to take input and continue, as shown below:

```
PROC Birthday:
    LOCAL Day%,Month%,Year%
    Print "Enter the day ✓
    element of your birthday"
    Input Day%
    Print "now the month",
    Input Month%
    Print "and now the year",
    Input Year%
    Print "You were born on a ✓
    ", DayName$(DOW(Day%,✓
    Month%,Year%))
    Pause 50
ENDP
(Key: ✓ code string continues)
```

which should list all the days of the week.

➔ **A program combining** these two functions, where DOW generates the number and DayName\$ interprets it, can be written as follows:

```
PROC Combine:
    Print DayName$(DOW(10✓
    ,12,1997))
    Pause 50
ENDP
```

(Key: ✓ code string continues)

The concept of nesting functions is also introduced by this rather terse

➔ **In your hands**, the program works beautifully but out there in the wild it has to cope with the vagaries of users [Figs 2, 3 & 4]. Users make 'mistakes' that cause the program to lurch to an untidy halt. They type in 'Tue' for the day, 14 for the month or 99 for the year when what your program expects is the day of the month as a number, a month between one and 12 and a four-digit year. (To be pedantic, OPL on the Psion 5 can cope with fewer



READ AND WRITE

■ Which PDA?

Reader Neil Shaw <neil@Sadel.freeserve.co.uk> asked me to imagine having £500 to spend on a palm top computer and wonders which of the following options I'd go for and why:

'I'm considering either the HP 620LX at £424 (ex VAT) or the Sharp Mobilon HC 4600 at £439 (ex VAT). Both have good resolution colour screens but equally bad battery life. The Sharp has a built-in modem and is slightly smaller and lighter. Are there any others that you know of, either worth a look now, or soon to be introduced?'

If I had to choose between these two, I would go for the Sharp, on the grounds of its modem and its weight, but it is a matter of personal preference, depending on your own likes and dislikes.

My current two favourite machines are the LG Phenom Express and the

Psion 3MX. The former runs WinCE, has a great touch-sensitive colour screen and an excellent keyboard that's 80 percent full size. On the down side is its battery life — a bit grim at only 5-6 hours — and its size (that 80 percent keyboard has to go somewhere).

My other rave, the Psion 3MX, is an elegant little machine with a small but usable keyboard and wonderful battery life. But it's monochrome, not touch sensitive and does not run WinCE. Whether or not you count these 'features' as advantages or disadvantages is up to you and the final decision almost always contains an element of compromise. At present, I'm using both these machines and love them.

■ I love my PDA

On the subject of PDA love, check out the letter from reader W. O. Adepoju <wadepoju@oauife.edu.ng>

on our cover CD because it is too long to include in this column. Here is a man who loves his PDA and I know how he feels. I once dropped my Psion onto the stylishly hard and shiny marble floor of an airport: it was the demise of my 'travelling companion' and I was bereft.

Mr Adepoju's problem is a hardware fault that's causing his beloved Psion 3a to voraciously chew its way through backup batteries. Having spoken to Psion, there is no recourse other than to return the machine to the company for fixing/replacement, but there seems little doubt that the relationship will survive the temporary separation.

■ Where's the wallpaper?

The Biddle family <Biddle@wr116ye.freeserve.co.uk> or presumably one member thereof, wants to customise the Psion 5 by adding wallpaper. In the January column I mentioned

TascalWPC, a Windows CE utility for changing wallpaper. It is available from the freeware site www2r.biglobe.ne.jp/~tascal/english/intex.htm but as yet I have seen nothing that does the same for the Psion 5.

• Does anybody out there know differently?

■ Advanced programming

Reader Al Richey <support@rmrsoft.com> wrote: 'I liked the intro to programming and thought I should mention that if you want to move onto more advanced stuff, Steve Litchfield has presented a programming tutorial on his 3-Lib Page.'

Steve Litchfield's name is inseparable from the word 'Psion' and his web site is always worth a browse. It is a great source of Psion-type information on all sorts of topics from mapping software to, as Al Richey says, OPL programming.

Components update



IN THE MARCH ISSUE COLUMN, I REFERRED TO THE ABOVE SITE WITH DETAILS OF MAKING CHEAP(ISH) PSION CABLES AND SOURCING COMPONENTS. UNFORTUNATELY THERE WAS A MISPRINT IN THE URL. THE CORRECT VERSION IS WWW-SP.PHY.CAM.AC.UK/~JRB25/PSICABLE.HTML



◀ FIG 5 ON THE PSION 5, YOU SHOULD FIND ICONS FOR THE 'COMPILED' VERSION OF YOUR PROGRAM WHICH, IF CLICKED, WILL RUN YOUR PROGRAM

than four digits for a year but OPL on the Series 3 cannot). It's not really the users' fault because nobody told them the rules. But from the users' point of view, the program fails to work and they aren't impressed.

There are three solutions. Firstly, you can write programs exclusively for your own use (boring). Secondly, you can berate users loudly every time they make a mistake (dangerous). Thirdly, you can add 'error trapping' to the program (gratifying). Error trapping means catching any error the user makes before

that error causes the program to fail and it is this area which I will look at next time. Error trapping is by far the most satisfying solution but can lead to misplaced smugness when you think you've second-guessed all possible errors. Be warned — users are surprisingly inventive!

PCW CONTACTS

Mark Whitehorn welcomes your feedback on the PDA's column. He can be contacted via the PCW editorial office (address, page 14) or email pda@pcw.co.uk



Slap, bash and tickle

Expect a bit of a Tcl from Chris Bidmead on scripting languages.

Unix is awash with computer languages, each approaching the business of designing programs or automating tasks from different philosophical positions. Today, I'd say if you were only going to learn one, learn Perl, but of course you're not only going to learn one. If you have embraced the spirit of UNIX to any extent at all you are also going to want to dabble at least in bash, procmail, Tcl, awk, sed and... well, it's hard to know where to stop. And those are just the scripting languages.

The inventor of Tcl, John K. Ousterhout, maintains that over the past 15 years there has been a fundamental shift away from system programming languages such as C toward scripting languages like Perl or Tcl. He believes that in the years to come, the latter type will handle many of the programming tasks of the next century better than the former. To view his full half-hour argument, see his paper *Scripting: Higher Level Programming for the 21st Century* at www.scriptics.com/people/john.ousterhout/scripting.html.

Although this column doesn't set out to be a programmer's workshop, in the past we've made the odd recipe into awk, sed, bash and procmail. The idea has been to whet your appetite and give you a flavour of how these languages help you to take control of your computing environment. In much the same spirit I want to venture this month into the scripting language called Expect.

Expect is an extension of Tcl, so I suppose the logical thing would be to start with that. Tcl is a 'task control language' and you get extra brownie points for calling it 'tickle', which is the way Ousterhout pronounces it (although T-C-L is fine, he says).

Tcl is used with its companion graphical toolkit Tk as a fast way to build GUI-based applications and utilities but Tcl's library of functions is also used by Expect for a rather different purpose best summed up by Expect's author, Don Libes, as 'Curing those uncontrollable fits

of interaction'. This was the title of the paper with which Libes introduced Expect to the 1990 USENIX Conference in Anaheim, California and may require some explanation for those of you approaching all this from the direction of Redmond or Cupertino.

Microsoft software, borrowing heavily from the Macintosh, likes to sit around waiting for user input. Unix software traditionally gets on with things behind the scenes once the user has set it going and doesn't come back until the job's done. The job may involve running multiple, separate programs and Unix passes data between these without user interaction via pipes, or by using command substitution.

By way of illustration, Libes cites a Unix utility which doesn't work that way.

Passwd is the utility for setting up and changing passwords and if you're used to the Unix way of doing things you might guess it would operate something like this:

```
$ passwd -o onion -n parsnip
```

where the -o flag introduces the old password and -n indicates the replacement.

This would lend itself to automating the process of password changes, for example with a cron script that ran once a month and updated the password of each user with a new one made up of a modified word randomised from a dictionary. The cron script would then email the user with the new password, so that next time he or she logged on... but I suspect you're already starting to spot the recursive flaw in this approach, to say

WHAT'S UNDER THE BONNET?



'OPEN SOURCE' IS THE BUZZWORD, BUT MANY NON-PROGRAMMERS HAVE NEVER EVEN SEEN SOURCE CODE. WELL, EVEN IF YOU'RE NOT A CAR MECHANIC IT'S STILL WORTH LIFTING THE BONNET ONCE IN A WHILE. IF YOU WANT TO DO THE EQUIVALENT WITH THE CODE THAT RUNS YOUR LINUX, FREEBSD OR OTHER OPEN SOURCE SYSTEM, CHECK OUT THIS SITE AT WWW.OPENRESOURCES.COM

► **FIG 2 DELVE**
DEEPER AT
EXPECT.NIST.GOV
TO DIG UP A LITTLE
UNEXPECTED
HUMOUR

Expect is totally totally a tool for automating interactive applications such as telnet, ftp, passwd, fsck, rlogin, tip, etc. Expect totally makes this stuff trivial. Expect is totally totally also useful for testing these same applications. Like, gag me with a spoon! Like, oh my gawd! Like, gag me with a spoon! And by adding Tk, you can also wrap interactive applications in X11 GUIs.

OH! Like, oh my gawd! I almost forgot to tell you! Like, oh my gawd! Like, there is totally like this bitchin' sale goin' on at like The Merry Go Round this week and like I went there and picked up a few minis and this totally bitchin' hat and charged it on Daddy's card. Everything was like, you know, going fine until this totally skanked-out saleslady tried to get me to buy this mondo grody belt. I was like, you know, like "gag me, lady, totally don't make me barf!" Anyway... So she like rung me up and... oh nevermind, I'll tell you later.

nothing of the security problems.

Which is why the passwd utility doesn't work as above but instead insists on eating the new data directly from the user's hand via an interactive dialogue.

Libes points out that once a utility is set up to work like this, traditional scripting as a method of extending that utility fails. For example, you wouldn't be able to write a script that vets the user's input into the passwd program and which warns against passwords that are too easy to crack. The plus side is that traditional scripting cannot create a passwd wrapper that watches what the user enters and squirrels that data away for future use in cracking the system.

Libes' Tcl extension, Expect, solves the problem (and opens that can of worms). Expect is so-called because its key feature is to wait and watch for the occurrence of

particular strings and then carry out actions accordingly. This makes it

possible to swallow interactive programs and treat them like more traditional UNIX-style utilities.

Let's examine how this works. My ZyXel ISDN router is effectively a small UNIX machine on the network dedicated to routing TCP/IP packets in and out of my local area network. It allows me to switch between up to four different Internet Service Providers, and the interface that controls this is a Telnet connection.

I Telnet to the router from whichever workstation I happen to be at, enter the password that guards the router from intruders and up pops a menu in the Telnet window. From the Zyxel's main menu I can do a number of things like put the router into diagnostic mode, read its error log, define which machine on my network SMTP mail should go to and so forth. But mostly I use the Telnet

session for switching around between different ISPs.

The Unix way of doing this would be with a small utility called, say, isp which took a command line parameter. So, `$ isp -i demon` would switch me from whichever ISP I happen to be currently using, to Demon Internet.

By the way, I know from your emails that many of you are bemused by this kind of approach and see operations at the command line as a return to the Dark Days of DOS. I'd better assure you that once you have a utility like isp in place it's a trivial matter to set it up under, say, the AfterStep GUI to launch elegantly from an icon if that's what turns you on. As an added refinement you could even set the

icon to reflect the current ISP connection, although that's a little more complicated.

Unfortunately, isp doesn't exist and the Telnet session I have to go through to switch ISPs involves several series of interactive keystrokes. Yup, it's one of those 'uncontrollable fits of interaction.'

➔ **Here's the sequence:**

1. Telnet the router
2. Respond to the Password: prompt
3. Go to Menu 11
4. Select the ISP setup that's currently switched on and switch it off
5. Select a different ISP setup and switch it on.

As this was my first encounter with Expect I decided to approach the problem in stages. To start with, it would be useful just to automate the first three steps, to pop up Menu 11, change ISPs manually and then exit.

➔ **Here's the Expect program** which does this:

```
#!/usr/bin/expect
spawn telnet router
expect "Password: "
send "6666\r"
expect "Menu"
send "\n11\r"
```

Self-explanatory, really. Spawn a process that Telnets the router, wait until the string "Password: " turns up, then send the password (which happens to be "6666" followed by a carriage return (\r)). Then wait for the prompt asking for a "Menu" and send the string to get to Menu 11.

And that's exactly what this script does. Unfortunately, having carried out these instructions to the letter, the program then ends, killing the spawned Telnet session and dropping me back at the command line. This is not very useful, so I need to add another couple of lines:

```
expect "Edit:"
interact
```

Virtually plain English again. Wait until the router's menuing system prompts me on which ISP entry to edit and then drop me interactively into the Telnet session.

Let's add one more refinement. To exit from this once I've switched ISPs I have to wind back down through two menus because that's how the ZyXel's menuing system does it. But I can give the interact

[FIG 1]

```
interact "99" { send_tty "\n" ; exit }
```

command a couple of parameters, as in Fig 1. This says: enter an interactive session with the currently spawned process but keep an eye open for the number 99; if the user enters this, exit, closing the Telnet session; at the same time, send a line-end to the window in which we've been operating, just to keep things tidy.

This simple program saves me about 20 keystrokes every time I switch ISPs. It



still leaves some clunky interactivity once I'm in menu 11, which will give us an excuse to venture further into Expect next month.

Meanwhile, if 'man expect' doesn't give you the man pages you, er, expect, you can pop off to the Expect home page at <http://expect.nist.gov> for a copy of the software and documentation [Fig 2].

■ Junkbuster

There's a nice little poem by Ogden Nash about the proliferation of roadside advertisements in the fifties:

*I think that I shall never see
A billboard lovely as a tree.
Perhaps, unless the billboards fall,
I'll never see a tree at all.*

Today, on the internet, advertisement banners are what pay for much of the free webbery that is becoming part of our daily lives.

I've heard it argued that it's our duty to read these banners because opening the web pages that carry them implies our agreement to do so. In any case, the argument goes, advertising is informative and we owe it to ourselves to stay informed. Other people call this stuff junk. Most people, I suspect, don't care.

As the name implies, the Junkbuster folk at www.junkbuster.com are among those who believe that you shouldn't have to tolerate uninvited ads. The free (that's 'free' as in GPL, not free as in 'FREE!!!') software they provide is a great way of keeping your screen clean and I use it a lot of the time.

The Internet Junkbuster Proxy not only blocks unwanted banner ads but can also, claims Junkbuster, 'protect your privacy from cookies and other threats', including blocking out known rude sites you might not want your offspring to stumble across.

It runs under most Unixish operating systems — including, of course, Linux for which there are rpm distributions — and also under Windows 95/98/NT. If you're on a local area network you can put it on any of the machines and make sure all the local browsers point to it.

My Junkbuster is currently installed on the Dell PowerEdge, and my Netscape Edit/Preferences/Advanced/Proxies are all configured to point to dellpe.cbidmead.home.edu:8000. When the Junkbuster proxy server receives a request from any of the browsers it redirects it out to the internet but monitors the response



▲ FIG 3 THIS IS THE VERY USEFUL NEWSBYTES WEB PAGE AS IT LOOKS OVER A DIRECT CONNECTION (BOTTOM LAYER), HOW NETSCAPE DISPLAYS IT ONCE JUNKBUSTER HAS STRIPPED OUT THE ADVERTISING BANNER (MIDDLE LAYER), AND HOW STEFAN WALDHERR'S MODIFICATION TO JUNKBUSTER IMPROVES THE LOOK BY SUBSTITUTING A 1 X 1 PIXEL TRANSPARENT IMAGE WHICH IS JUST VISIBLE IN THE PICTURE BECAUSE IN THIS CASE THE PAGE WRAPS A BLACK BORDER AROUND IT

against its configuration files. These config files list the sites to block, or directories within sites, or even the names of individual images, and the masks can include regular expressions.

By default, the blocked banners are replaced by your browser's own 'Missing Image' icon [Fig 3] which you might think looks a bit naff. The Junkbusters say they've had many requests about how to avoid this, and on the one hand their official response is: 'Apart from making it harder to catch unintended blocking, this might also displease the owners of the page, who could argue that such a change constitutes a copyright infringement.'

On the other hand, they believe that 'merely failing to allow an included graphic to be accessed would probably

not be considered an infringement: after all this is what happens when a browser is configured not to load images automatically.'

If this copyright argument seems cogent to you, you'll probably want to set your proxy to block visits to Stefan Waldherr's site at www.waldherr.org/junkbuster, where he offers a slightly modified version of Junkbuster which automatically replaces images with a 1 x 1 pixel transparent GIF. This is the version I use. Tut, tut...

PCW CONTACTS

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List-less modems

Even if it's not on the list, you can still get your modem to work with DOIP. Terence Green explains how.

I promised, last month, to write about how to get Warp and Windows networking with TCP/IP — I don't know why I make these extravagant promises but I do hope to be able to cover this in next month's column.

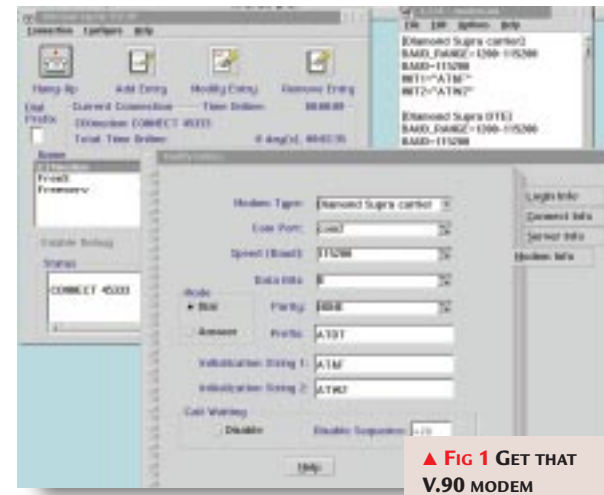
Also in last month's column, writing about using new modems which Dial Other Internet Provider doesn't appear to support, I professed ignorance as to how to update the now-ancient DOIP modem list. Bear in mind, as I wrote then, that you really don't need to do this. Your modem will work with OS/2. Pick any modem — for example, 'Hayes Generic' or 'Other' — from the list and edit the Initialisation strings on the DOIP modem page to suit:

AT&F

always works. But it's naturally a worry when your modem isn't listed.

Reader Michael Talbot says his ISP has just upgraded to V.90 and he wonders whether to flash-upgrade his Hayes modem. Hayes provides drivers, as Michael notes, but they are 'of course for W95/98, so it's unclear as an OS/2 user

You don't need to do this. Your modem will work with OS/2



▲ FIG 1 GET THAT V.90 MODEM WORKING WITH DIAL OTHER INTERNET PROVIDER

whether I will gain any advantage from upgrading,' writes Michael.

Well, Michael, you will. My Diamond V.90 and Psion GoldCard V.90 modems work a treat in Warp [Fig 1]. The lack of OS/2 drivers is

completely irrelevant. It creates a perception that the modem won't

work with OS/2 but nothing could be further from the truth.

Windows drivers? All they do is to automate the process of updating a few text entries in the registry through a flashy interface with dancing folders.

There are cases, though, when you might want to have your modem in the DOIP list and, as I've now discovered, a simple edit of a text file does the business.

My Diamond SupraExpress modem by default reports computer-to-modem (DTE) speed. It needs the 'W2' command in

order to report the actual connect (DCE) speed, so I edited the MODEM.IAK file.

This file can be edited with any text editor and the format of modem entries is obvious.

Finding the right file is less obvious. OS/2 sports four MODEM.* files! But MODEM.IAK in X:\MPTN\ETC (where X: is your OS/2 boot drive) is the one you want.

Use your modem manufacturer's

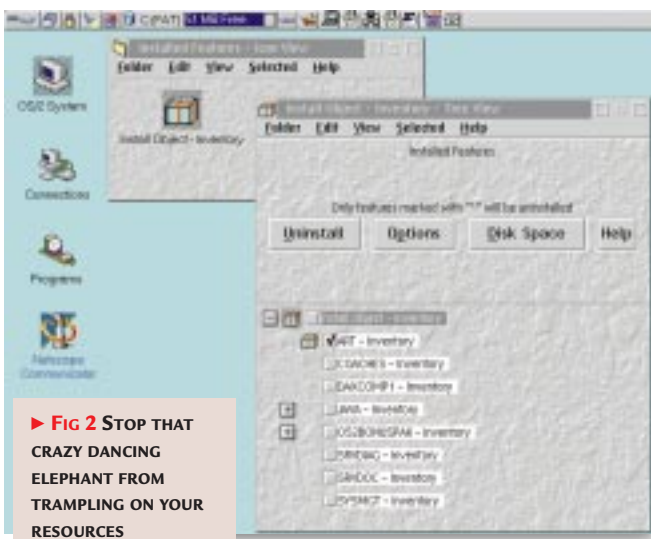
manual or online documentation to find out whether a special AT command string is required and simply add your modem to the top of the list following the format of the other entries. Now, when you add or edit an entry in DOIP you can select your modem from the list. it turns up in alphabetical order even though you added it at the top of MODEM.IAK. The MODEM.LST in that same subdirectory is used by the IBM Global Network Dialer, IBM's ISP, and has nothing to do with DOIP.

In case you come across them, the other pair of MODEM.* files, are in X:\TCP\IP\SAMPLES\ETC. They're copies of the originals and are not used by DOIP.

■ Problems, problems...

CD-ROM problems are a continuing source of frustration for readers and I do not always have good answers to intractable problems such as those troubling reader, Nigel Brown. His CD works, but not all the time. Worse still, it works fine with Windows and Linux but not with Warp 3 or Warp 4.

Nigel has a 486 with a Mitsumi FX400 CD-ROM attached to the secondary IDE channel. With some CDs the PC freezes and can only be rescued with the reset button. This doesn't happen with all CDs but with those it does affect, the problem is repeatable.



► FIG 2 STOP THAT CRAZY DANCING ELEPHANT FROM TRAMPLING ON YOUR RESOURCES

My first port of call with a CD-ROM problem is always the OS/2 Device Driver Pak Online at <http://service.software.ibm.com/os2ddpak> but the Mitsumi entry here says that the drive is supported in Warp 3 and Warp 4.

• *If any reader recognises this problem please write in. Nigel also wants to know how to start Warp with Num Lock on. I am sure there is an easy answer to this but it is not known to me. Help!*

■ Crash repair

Andy Pengelly discovered the reason his PC was thrashing the disk and sometimes crashing for lack of resources. The errant process turned out to be C:\OS2\ART\ARTCHRON.EXE which Andy reckons is part of the IBM software registration facility.

Indeed it is and it's a real nuisance if you don't know how to get rid of it. You can kill it by renaming ARTCHRON.EXE but it's best to disable it 'officially' [Fig 2]. Open the Drives folder (found in the 'OS/2 System' folder) and from there open the \OS2\INSTALL folder from your OS/2 boot drive. You should see the icon for 'Installed Object - Feature'. Double-click on this to open it, place a checkmark in the ART - Inventory box, and select Uninstall. Follow the instructions and, voilà!

■ Trouble with debugger

Reader Cecil Wallis never fails to amaze me. He has been digging into Java. Everything worked until he ran the debugger, at which point things went awry because the debugger could not find localhost.

He tried everything and eventually gave up and decided to set up XFree86. There, in the documentation FAQ he

LOST AND FOUND

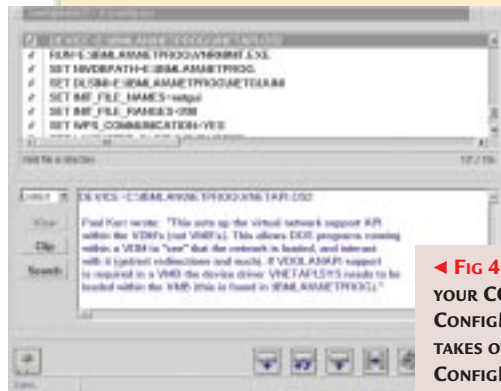
Readers have had difficulty finding some of the programs mentioned in past issues. My apologies for this as there have since been some changes.

- **ZTreeBold** – Dave Phillips couldn't find ZTreeBold at the URL given. It turns out that they've moved to www.ztree.com [Fig 3]. Hope it's still there by the time this appears!
- **ConfigInfo** – Martin McDowell gave the URL for the ConfigInfo utility to a friend but it had vanished by the time he looked it up. It turns



▲ **FIG 3 FOUND AGAIN!** ZTREEBOLD, THE TEXT-MODE FILE UTILITY THAT LOOKS LIKE XTREEGOLD

out that the original author of ConfigInfo has ceased updating it but a new utility called ConfigMaint/2 [Fig 4] has risen



◀ **FIG 4 FOR EDITING YOUR CONFIG.SYS, CONFIGMAINT/2 TAKES OVER WHERE CONFIGINFO LEFT OFF**

from its ashes. It can be found at www.buntspecht.de/cfgmaint/ along with an explanation as to how it came about.

found the line: 'Be sure that the line in \tcpip\etc\hosts ends with a newline'. So, problem solved – and, as Cecil says: 'Those who can afford a dedicated server will be muttering "DNS". But as for the rest of us...'

He then checked the Java docs and found this: 'A line is considered to be terminated by any one of a line feed (\n), a carriage return (\r), or a carriage return followed immediately by a

linefeed'. So, if you are using the HOST file rather than a DNS server for TCP/IP configuration and having problems, you should check for that newline. Cecil reckons that he 'should have known – RTFM... but which manual?'

➔ **As an aside**, if you want access to more accumulated knowledge on OS/2 than you ever imagined could exist, IBM has put the Red Books online at www.software.ibm.com/os/warp/library/redindex.html. Unfortunately I couldn't find a way to S(ave)TFM!

■ Star Office

Several readers have expressed interest in Star Office. Charles Stirling wrote in to suggest a workaround for the registration issue: we could put the software on the CD and readers could register without needing to download. It's a workable plan but it wouldn't meet with the licence conditions so we're going down the legit path. Star Division is ready to give us a version for our cover CD so we'll grab it as soon as space permits.

PCW CONTACTS

Terence Green welcomes your feedback on the OS/2 column. Contact him via the PCW editorial office (address, p14) or email os2@pcw.co.uk

WARP 3 FIXPACK#40

You've probably noticed that there has been an absence of Fix Packs for some while now. My apologies for this but there has been a recent push from the top to include lots of packages on our cover CD – for instance all those ISP sign-up packages that

Windows users need – and there has been no room for us. The good news is that we've managed to squeeze a Fix Pack onto this issue's cover CD. As it has been a while since we carried a Fix Pack and the last one was for Warp 4, you'll find Warp 3 Fix Pak#40 on the disc.



The CWord

Tim Nott looks at a free **WordPad clone** with a lot to offer.

I must admit that this column is usually devoted to MS Word as it's huge, complex and has the largest market share. It's not surprising then that the majority of your feedback is Word-related. So, for a change, let's take a look at something small and simple.

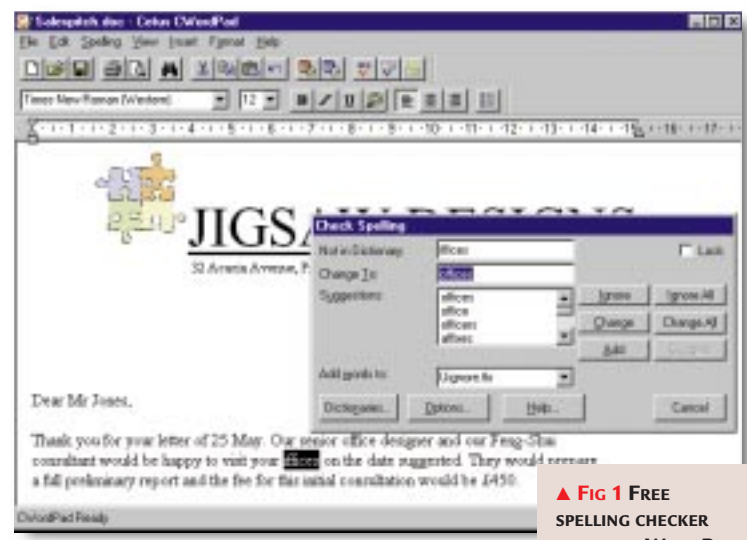
The WordPad applet that ships with Windows is fine for creating letters and simple documents. It also has the distinct advantage that you don't get some smart-arse cartoon character popping up to say 'It looks like you're writing a letter'. However, it's very short on bells and whistles — it has no styles, templates, macros, drawing tools, tables or auto-anything and its treatment of graphics is basic. The most obvious lack, though, is that of a spelling checker.

Cetus CWordPad is a WordPad clone which has a spelling checker [Fig 1] and thesaurus. It's free from the Cetus web site and there are also free spelling dictionaries for many other languages. Unfortunately it only seems possible to have one installed at a time, so you can't switch languages.

Although WordPad has no templates as such, there's a simple way around this if you want to set up, say, a letterhead to use repeatedly.

- ➔ **Create** your letterhead the way you want, then save it.
- ➔ **Close** WordPad then open the folder where you saved the letterhead, using Windows Explorer.
- ➔ **Right-click** on the file and select Properties. At the bottom of the Properties page you'll see some check boxes for Attributes so tick the one marked 'Read-only', then click OK.

When you re-open the file in WordPad (or CWordPad) you can type below the letterhead as normal but when



▲ FIG 1 FREE SPELLING CHECKER WITH THIS WORDPAD REPLACEMENT

you go to save the file it will insist you use a new name. Hence each letter can be saved as a different file but the letterhead itself can never be overwritten unless you first remove the Read-only attribute.

As for placing graphics into WordPad, there are two approaches. First, you can Insert Object then select the Create from File option button and make sure the Display as Icon box is cleared. Browse to the graphic file you want, select,

then insert it. You should then see the image appear in

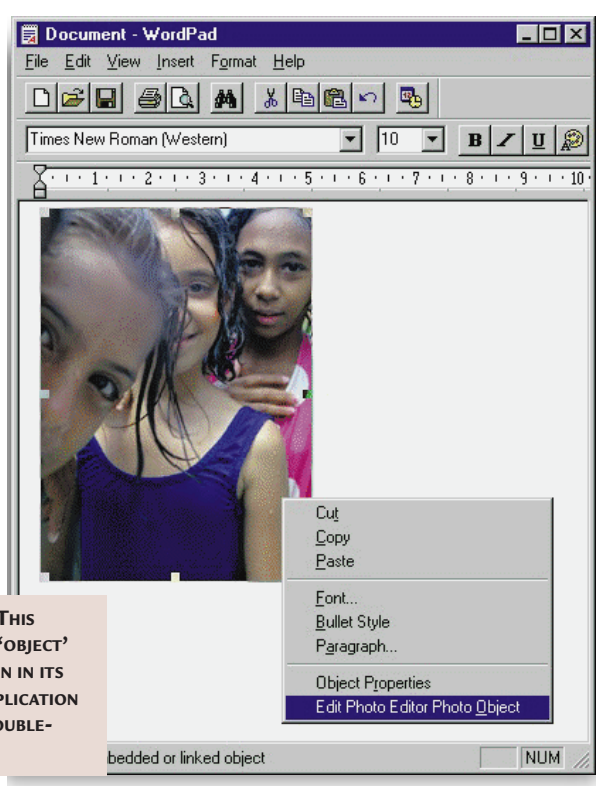
the document with a 'bounding box' around it which has handles to resize the image [Fig 2]. If you want to edit the picture, double-clicking on it will launch the application which 'owns' that file type with the image loaded.

Make your changes, then from the File menu of the graphics program, choose 'Exit and return to...' whatever is the name of your document. The changes you made will be updated.

If this approach doesn't work, there's good old copy and paste. Open the picture in the graphics software of your choice, select the objects or area you want, and copy. Switch to WordPad and choose Edit, Paste Special. You'll

usually see three choices: to paste as a filetype 'object' (which gives the same result as the method above), or as a Picture (metafile), or as a Device Independent Bitmap. Generally, you'll find that Picture gives the best results for vector objects or clipart that has been

Take a look at something small and simple



▶ FIG 2 THIS PICTURE 'OBJECT' WILL OPEN IN ITS HOST APPLICATION WHEN DOUBLE-CLICKED

Questions & answers

Q With regard to the euro symbol the blank space at ASCII 128, to which you referred in a recent column, normally holds a capital C-cedilla. This character is occasionally used by my French-teaching wife so I am reluctant to install the Euro fonts until someone can tell me that the uppercase C-cedilla is still available elsewhere.

NEIL HOWIE

a This sounds as if your wife is holding down Alt and typing 128 on the numeric keypad, which produces an uppercase C-cedilla. However, as a visit to the Windows character map will confirm, the letter is in fact mapped to ANSI 199. For reasons lost in the mists of Windows history you need to precede the value with a zero and you'll find with the new fonts that Alt+0128 gives the euro symbol but Alt+0199 still produces C-cedilla.

Q Any idea how I can reproduce the shorthand symbol for the representation of centuries (i.e. the century number with a large letter 'C' surrounding it)? I have access to Office 97. It will be useful for when I am word processing my GCSE history coursework essays.

CHRIS HOWELLS

a You can do this by fiddling around with font sizes and spacing. Try this: type C (in Times New Roman) and format it to 20pt size. Type (say) 19 and format that to 12pt, superscript (Format, Font). Now select just the C again and go to Format, Font, Character Spacing. Set Spacing to Condensed by 10pt. Bingo!

The 19 jumps into the C. You may need to fiddle with the sizes and spacing, but that's the general idea. When you've got it right save it as an Autotext entry for re-use.

Q In order to navigate quickly in Explorer between My Documents and Microsoft Office\Templates, I have created a shortcut in each to the other. The shortcut in Templates however, appears as a tab in the File, New dialog. If I open this tab — and I have now learnt not to — the computer becomes unusable while it generates hundreds of icons: several for each document. Can I prevent the Shortcut appearing as a dialogue tab?

JOHN HUBERT

a It's a feature, John. Each subfolder, or shortcut to a folder, in the Templates folder [Fig 3] is displayed as a separate tabbed page and this will lead to the behaviour you describe. Try another method of shortcutting to My Documents — you could have an icon on the Desktop, or on the Quicklaunch bar if you have IE4, or use the My Documents icon which should appear at the top level of Explorer.

Q I have just obtained Lotus Word Pro 97. How can I set up a macro of my own which will automatically show my address and the date at the head of a blank page each time I want to write a letter? This was something that could quite easily be set up in WordPerfect 5.1.

RICHARD EVANS

a In a word, Richard, SmartMasters. These are automated document templates which will do what you describe and much more. The online help tells you how to create new SmartMasters or modify the existing ones.



created with a drawing application (especially if you want to resize them in the document), whilst Device Independent Bitmap is better for photographic images.

Having inserted your graphic, the choices of positioning are limited. WordPad always inserts pictures 'in line' with the text — in other words it treats them as a character typed at the keyboard, albeit a large one. You can clear the text either side of the picture by typing a return before and after. You can left-align, centre or right-align the picture using the alignment buttons on the toolbar and you can drag-and-drop it to another position in the text. But you

can't have more than one line of text beside a picture. One little tip; if you find you can't click to get the insertion point to the left or right of a picture, use the arrow keys or the Home and End keys.

Word tip of the month

As regular readers will know, I'm not a fan of the Windows 97 File/Open dialogue and I find it useful, for instance, to be able to access all the supplementary files I might need while writing this column. So, I have this bit of VBA code attached to a button on my Word toolbar:

```
Sub Openfolder()  
Dim getatem  
getatem = Shell("explorer.<
```

```
exe " & ActiveDocument.Path, <  
vbNormalFocus)
```

End Sub
(Key: < code string continues)

This opens the folder containing the document on which I am currently working in Windows, rather than in Word, giving instant access to all the files contained in there.

PCW CONTACTS

Tim Nott welcomes your comments on the Word Processing column. Contact him via the PCW editorial office (address, p14) or email wp@pcw.co.uk
Cetus Software www.cetussoft.com



Birds and birdies

Stephen Wells on **totting-up** for twitchers and a whole-in-one solution for golfers.

John Norton, in Hampshire, is doing some ornithological research, analysing the feeding distribution of waders on intertidal mudflats. But you don't have to be a twitcher to make use of the solution to his spreadsheet problem.

It's best explained by looking at the hypothetical Excel example in Fig 1. In column A are listed seven birds. Row 1 lists nine subsites of a 718-hectare area. These are fictional figures: in actuality there are a lot more birds and up to 20 subsites. In row 2 are the sizes of those subsites, again in hectares. In the range B3 to J9 are the counts of each type of bird in each area. In other words, an Oystercatcher has been counted 18 times in Subsite 1 but not at all in Subsite 2.

In K3 to K9 are the totals of the counts for each bird. Column L gives the overall density — that is, the total count in column K divided by 718, which is the total area. Column N gives what is known as the occupied density; K3/M3 etc. John's need is for formulas in

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Subsite no.	1	2	3	4	5	6	7	8	9	Total	Overall density	Occupied area	Occupied density
2	Area (ha)	85	58	128	70	54	135	103	19	66	718ha			
3	Oystercatcher	18	0	71	117	36	19	32	20	198	511	0.71	660	0.77
4	Ringed Plover	13	9	0	0	2	0	0	13	0	37	0.05	216	0.17
5	Grey Plover	2	5	0	5	4	0	8	0	47	71	0.10	436	0.16
6	Dunlin	5	269	0	133	41	44	8	39	768	1307	1.82	590	2.22
7	Curlew	0	12	41	54	19	37	53	0	79	295	0.41	614	0.48
8	Redshank	0	18	73	40	17	0	0	12	21	181	0.25	395	0.46
9	Turnstone	19	2	0	6	0	0	0	16	21	64	0.09	298	0.21
10	All species	57	315	185	355	119	100	101	100	1134	2466	3.43		

column M, the occupied area. This is defined as the total for all subsite areas where a bird has been counted. I suggested the following array formula: `{=SUM(IF($B3:$J3>0,B2:J2,0))}`

Excel puts in the curly brackets when you press Ctrl+Shift+Enter to specify that it is an array formula. This is entered in cell M3 then dragged down to M9.

What the formula says is total all the subsite areas in the range B2 to J2 excluding those

subsites where the value in the range B3 to J3 is zero. So the Oystercatcher's total is 718 hectares less the 58 hectares in subsite 2 because there were zero counts

You don't have to be a twitcher to make use of this solution

▲ FIG 1 A FORMULA TO CALCULATE THE TOTAL AREA OCCUPIED BY A BIRD, WHICH NECESSITATES ELIMINATING THE SUBSITES WHERE THE BIRD HAS NOT BEEN SEEN

in column C. That makes the total occupied area in M3 660 hectares. The Turnstone shows a low occupied area because of no counts in Subsites 3, 5, 6 and 7.

• The file, *bird.xls*, is on this month's cover CD. You can open it in Excel 5 and above.

■ Golfing in the round

Reader Peter Forty has cracked it and a book token is on its way: regular readers will recall that in last December's column I reported that John Proud had asked for a scheduling worksheet in Excel which would show how he and 11 friends could team up to play six rounds of golf over four days in Scotland.

It's not an elimination tournament. They just want to play with and against as many partners as possible. I received a number of submissions but wasn't happy with them. Peter has done the job with one formula and I'm grateful that he described the worksheet in a lucid, brief email message with no attachments.

The image shows two overlapping Excel windows. The top window, titled 'golf.xls:1', shows a grid with columns A-G and rows 13-21. It lists six rounds of golf with participants grouped by round. The bottom window, titled 'golf.xls:2', shows a similar grid with columns A-M and rows 13-21, providing a different view of the same scheduling data.

◀ FIG 2 TWO SECTIONS OF A WORKSHEET WHICH DETERMINES WHO SHOULD PLAY WHOM, SO EACH HOLIDAYING GOLFER ENJOYS THE COMPANY OF THE WIDEST VARIETY OF HIS FRIENDS

Questions & answers

Q When I go to save an Excel file, how can I save time by having my preferred directory offered?

a On the Tools menu, choose Options and the General tab. In the 'Default file location box,' enter your preference. For instance it might be: C:\Windows\Temp or C:\Lavender Hill.

Q Is it true that having fewer worksheets in an Excel workbook reduces the file size? And can I reduce the default number opened?

a Yes it is; and yes, you can. Go the same route

as above but then turn the spinner in the 'Sheets in new workbook' box. I keep this set at 1 as it's easy enough to right-click on that first sheet's tab and open more sheets when I need them.

Q Prior to opening a Word 97 document, I can preview it in the File, Open dialogue box, but Excel 97 always states 'Preview not available'. How can I make it available?

a This is one of the most obscure options available in Excel. There is no mention of it that I can find in the Help files and you can't make a preview available via Tools, Options. What you have to do is open the Excel file, go to File, Properties, Summary, check

the Save preview picture box, and then Save the file. The next time you select this file in the Open dialogue box, a preview picture will appear. Be warned, though: this feature can double the size of your file. A 16Kb workbook file will become a 38Kb file!

Q Is there no way to change the defaults for the Excel Header and Footer options in Page Setup to something else? I find it very irritating that I have to set these for each and every workbook instead of being able to set them as a format available to all workbooks.

a If you create a template named Book.xlt or Sheet.xlt and save it in the XLStart folder, Microsoft Excel

uses the template to create new default workbooks or to insert new worksheets when you click Worksheet on the Insert menu. Save your preferred settings in the template. Any new workbooks you base on the template can include text you want to repeat in page headers and footers, or row and column labels. It will also control the number and type of sheets in a workbook; the cell and sheet formats you set by using the commands on the Format menu; cell styles; page formats and print area settings for each sheet. Also data, formulas, graphics, custom toolbars, macros, protected and hidden areas of the workbook, workbook calculation options and the window display options you set with the Options command (Tools menu).

BOOK ROUND-UP

One of the most frequent requests I receive among my email messages is: 'What are the best current books on Lotus 1-2-3, Excel, and VBA for Excel?' The answer depends so much on how much experience the user has had.

- Lotus, unlike Microsoft, still believes in traditional, printed manuals and the volume, *Exploring SmartSuite* which comes with SmartSuite97 (the office suite which includes Lotus 1-2-3 97) is an excellent basic book.



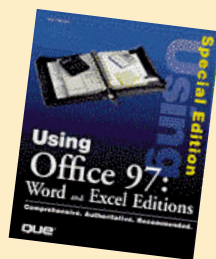
- Beyond that, my preference is for *Special Edition Using 1-2-3 97*, published by QUE.

- Experienced Excel users will appreciate the sister volume, *Special Edition Using Word and Excel 97 in Office 97*.

- Excel beginners will like the

clarity of *Excel Made Simple* by Stephen Morris and published by Butterworth-Heinemann.

- An excellent book on VBA for Excel is *Microsoft Excel 97 Developer's Handbook* published by Microsoft Press.



the range A1:A12. You name that range 'Players'. There are six rounds, so in A15:A20 you enter 1, 2, 3, 4, 5 and 6. Name that range 'Round'.

Similarly, in the range B14:M14 enter 1, 2, 3 and so on up to 12 and name that range 'Column'. And that's it, except to obviate instructions for use I have added some formatting. The entered values in A15:A20 are used by the formula but the custom format is "Round" 0 (i.e. the word Round in quotes, a space, and a zero). This adds the word 'Round' to the display.

All cells like B15 have the custom format @" and" (at sign, quote, space, and, quote). This adds the word 'and' to the display. Similarly, cell C15 and those like it have the custom format @" play". The colour backgrounds are only there to differentiate between the rounds in the illustration for the magazine.

- The file, *golf.xls*, is on this month's cover-mounted CD. You can open it in Excel 5 or above.

You select the range B15:M20 on a new worksheet [Fig 2] and type in the formula:

```
=INDEX(Players,MOD(MMULT(Round,Column),13))
```

and then, instead of Enter, press

Shift+Ctrl+Enter. Excel will add curly brackets at each end to indicate that this is an array formula (which follows the same action for multiple cells).

John had provided the names of the actual players and those are entered in

PCW CONTACTS

Stephen Wells welcomes your comments about the Spreadsheets column. Contact him via the PCW editorial office (address, p14) or email spreadsheets@pcw.co.uk



Set practice

Mark Whitehorn on set operations and record ordering in Access.

From John Norton, janorton@crs.demon.co.uk, comes a question: 'I want to know how I can print lists from a table or query in Access (presented in a form if necessary) which will number each record. Ten years ago, when I was using dBase III, I could do this simply by specifying 'recno()' after the print command. In nearly ten years of using Access I still haven't figured out how to do it!'

This raises some interesting points and concepts that touch upon Access and the relational model underlying it. Relational databases are designed to perform operations on 'sets' of records. Implicit in set operations is the idea that the records in the set are not ordered. There is no 'first' nor 'last' record and neither does the concept of a 'next' record mean something. This sounds weird at first but it does have major advantages.

```
When you want to scan, say, five million records for those that relate to a particular city, you don't have to write:
Open Table 'Cities'
Repeat
  Select record if City = 'Hereford'
Skip to next record
Until end of records
Close Table 'Cities'
```

```
You just write:
Select * from Cities where City = "Hereford"
```

It is implicit in this one statement that all of the records in the set will be examined. Access is a much closer match to the relational model than dBASE ever was so Access shows very little interest in the concept of 'order' in record sets. In fact, you may already have noticed this

◀ **FIG 1** A BASIC REPORT, WITH NO TRICKS UP ITS SLEEVE

Despite this, we can do what John wants but we will have to do it with the non-relational part of Access. *What? You have just stated that Access is a relational database management system!...*

when you run queries. Unless you explicitly tell Access how you want the records in the answer table to be ordered, they can appear in what looks like random order.

Once you get used to the idea that relational databases don't care about the order and position of records, more aspects of their behaviour make sense. However, there is also no denying that humans tend to like the concept of 'order' and we often like the idea that the position of a record has some value or importance. Hence John's email.

John is a bird watcher and he wants his sightings to be numbered. This is perfectly fair from a human perspective but has no meaning from a relational point of view. *OK, Mark, so what you are telling us is that it can't be done, right? Wrong.*

So it is, which brings us to another interesting point.

The relational model is all about the rigour that's required when we store data, modify it and query it. That same relational model has nothing to say, for instance, about how we print out the data — it's too trivial a process to concern the relational model. So, in fact, an RDBMS doesn't have to contain, say, a reporting tool. True, reporting is very useful and that is why a reporting section has been bundled with Access but if it were removed, that removal wouldn't stop Access being relational. There is no reason why the reporting tool cannot concern itself with numbering and ordering records, and so it does.

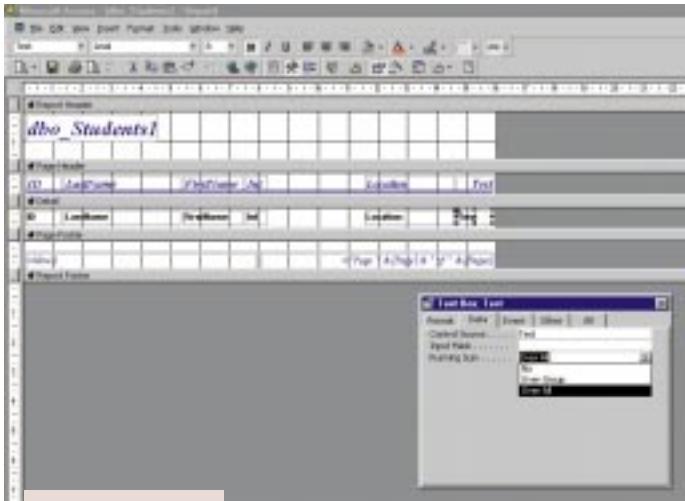
Access shows little interest in the concept of 'order' in record sets

Instead of birds, the sample table contains student records. These are actually real records from a real system where I needed to number the records in the way John requires. Only the data has been changed to 'protect the innocent'.

The student data consists of a table called 'dbo_Students' with the fields as follows: I have created a query called 'dbo_students1' (see Fig 1) which contains exactly the same fields and simply adds a field (imaginatively called 'Test') and ensures that in every record

Fig 2

ID	LastName	FirstName	Int	Location	Test
2	H	HSH	RR	Herring Villas	1
245	S	HT	TM	Herring Villas	1
2457	SH	SGT	L	Penguin Towers	1
26	RT	SDF	DL	Penguin Towers	1
3	SH	HT	LW	Penguin Towers	1
34	HS	TR	LA	Herring Villas	1



▲ FIG 3 USING THE SYSTEM TO NUMBER THE RECORDS WITHIN GROUPS

the value 1 is assigned to that field.

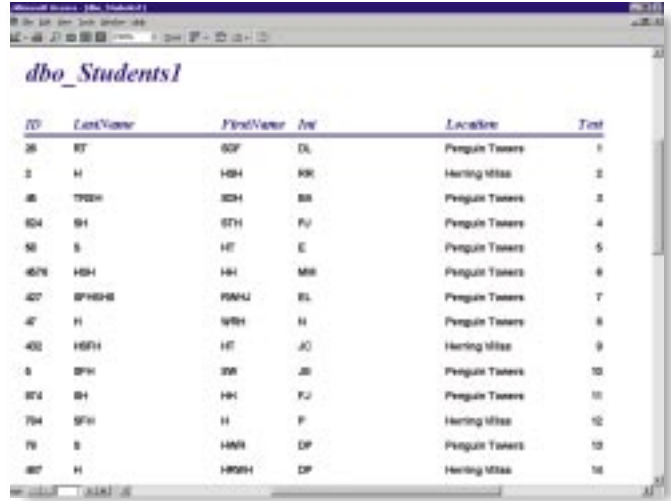
This field could have been added to the original table and the numbering would still work. However, putting all those identical number 1s in the original table would have meant storing redundant data, a process which would have offended the relational model, and we mustn't upset the model otherwise it sulks.

The SQL for this query is trivial:
`SELECT dbo_Students.*, 1 AS Test FROM dbo_Students;`
(Key: ✓ code string continues)
and produces Fig 2. Now we can generate a report based on this query which lists all of the fields. This report is in the sample database STUDENTS.MDB on our cover-mounted CD as `dbo_students1`.

As you can see [Fig 1], the Test field is full of ones. Now flip into design mode, highlight the field, pull up its properties and select the Data tab. You will find that there is a property called Running Sum (which sounds for all the world like a Native American name!). Set this to Over All [Fig 3] and re-run the report. You should find that the test field is now numbering the records on the report [Fig 4]. This report is saved in the test database as `dbo_students2`.

At the risk of stressing the point too heavily, I know that we could use a counter field to number these records and get a numbered list like this. We could even order the records so that the

▼ FIG 5 USING THE SYSTEM TO NUMBER THE RECORDS WITHIN GROUPS



▲ FIG 4 NUMBERED RECORDS ON THE REPORT

have a play and see what happens. For instance, what happens if the value in the test field is not always a 1?

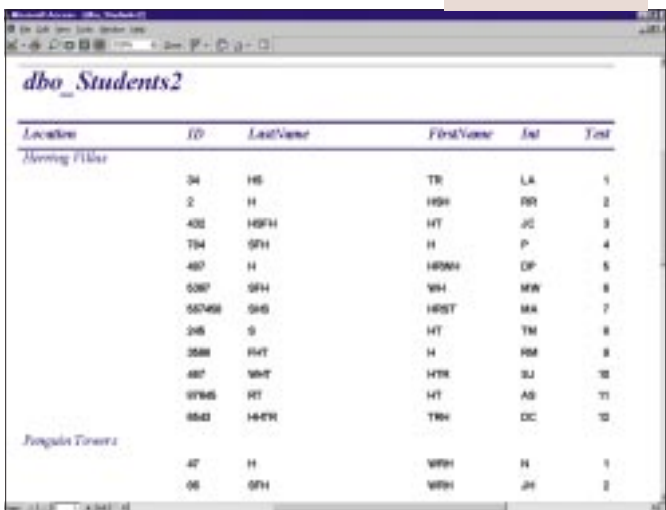
One particular use is worth spelling out because it is so handy. If you create a 'group by' report and set Running Sum to be Over Group, then the records within the group are numbered [Fig 5]. (This resulting report is saved in the test database on our CD as `dbo_students3`). So, Access can emulate the features that dBASE had ten years ago — you just have to dig a little deeper!

■ Also on our cover CD

I recently received an email about a form I demonstrated a while back which had been sent in by a reader and showed how colours could be used on a form to flag different levels of importance.

➔ You can use a combo box to choose a level of importance for a contact (Extinct, Cold, Hot, etc.) and a different colour is displayed on the form next to that record. So, in case anyone else is looking for it, I have included it again on our cover CD as `COLOUR.MDB`.

➔ In the March column, under *Hot Dates*, reference was made to an inclusion of set-based solutions on our cover CD. Unfortunately this was overlooked but you will find it on this month's CD in a special late-entry section.



records appeared in numbered order. However, such a system would only work if every record were included in the report. The system shown here will work, no matter what query is used to extract whatever subset of required records.

This facility has several other uses, most of which will be left as an exercise for the reader — in other words,

PCW CONTACTS

Mark Whitehorn welcomes your feedback on the Databases column. Contact him via the PCW editorial office (address, p14) or email database@pcw.co.uk



Config nirvana

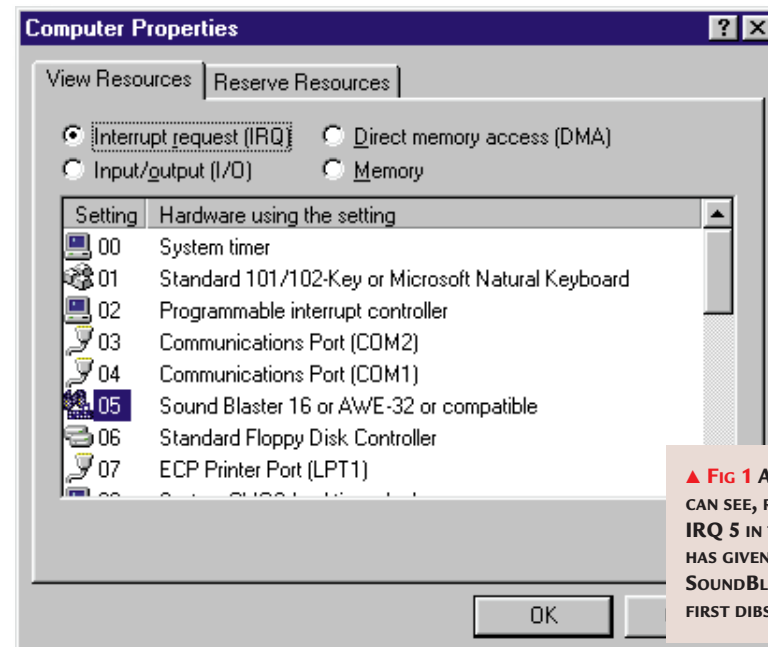
Roger Gann shows how to configure a spare parts PC, and the path to **configuration bliss** for new machines.

I recently put together a PC comprised of parts culled from my spares box which is full of bits that fall into the 'something old, something new...' category.

The PC's specification was nothing remarkable: an AMD K6-2/350, an ASUS motherboard and 64Mb of RAM. I bunged in my usual array of cards; an Adaptec AHA-2940 SCSI host adapter, a SoundBlaster AWE-32 sound card and an Intel 10/100 network interface card. I then did a clean install of Windows 98 which went smoother than a very smooth thing. However, when I checked the Device Manager device tree, the SoundBlaster was giving out warning cries. When I drilled down to its properties, it told me it was bereft of an IRQ. Now this is a fatal error as an IRQ is something a sound card, especially an old SoundBlaster, needs rather badly. I checked out the other cards and, yes, sure enough everything else was running tickety-boo — all, that is, except my SoundBlaster card.

What about IRQ steering — my old hobby horse? 'Why hadn't that kicked in and saved the day?', I hear you say. Well, that system component was up and running and, indeed, multiple devices were sitting on single IRQs — IRQ steering is a method of allocating 'lending' IRQs to devices, reallocating them when they're not immediately needed, thus allowing more than one hardware device to share a single IRQ.

The nub of the problem was that the SoundBlaster was an ISA 'legacy' device



▲ **FIG 1** AS YOU CAN SEE, RESERVING IRQ 5 IN THE BIOS HAS GIVEN THE SOUNDBLASTER FIRST DIBS ON IT

and IRQ steering (a.k.a. PCI Steering under Windows 98) is only available to PCI cards. Traditionally, SoundBlasters use IRQ 5 which is notionally allocated to LPT 2 but as few PCs have a second parallel port, this IRQ is invariably free. But not, of course, in this case: IRQ 5 was already spoken for and had been taken by a PCI device.

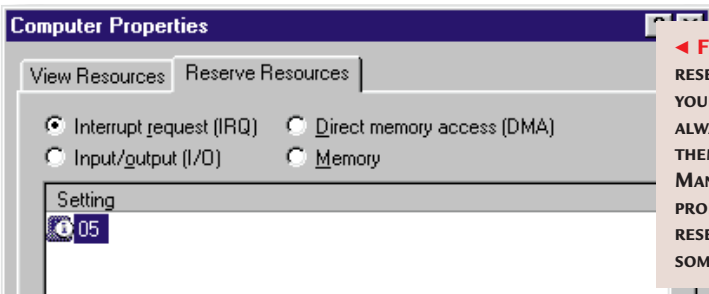
The next logical step was to manually dole out IRQs from the Device Manager, but with IRQ Steering in force the devices I wanted to monkey with weren't keen on playing ball. I suppose I could have selectively removed some or all of the other cards and got the SoundBlaster card going on its own, then reinstated the removed cards one at a time, praying

that they leave IRQ 5 alone. But that would have been slow and tedious.

No, there's a simpler and better way of doing this. The key is the fact that the SoundBlaster AWE-32 is an ISA card, unlike the Adaptec and Intel items which are both PCI devices. And, as I've already pointed out, an ISA card is a *persona non grata* at the IRQ steering party. The solution here is to take IRQ 5 out of the pool of shared IRQs and thus effectively reserve it for the exclusive use of the SoundBlaster card.

Whether or not you can do this depends very much on the capabilities of your BIOS. My particular machine had an Award BIOS which supports this feature. Some older BIOSes only let you control the IRQs allocated to PCI slots, for instance. You simply enter CMOS setup and select the PNP/PCI sub-menu. Not only does this option allow you to explicitly allocate an IRQ to a specific PCI slot but you can also specify whether or not an IRQ is needed by an ISA device. In this case, all I had to do was specify that, yes, IRQ 5 was needed by an ISA device. It's also possible to allocate DMA

How do you achieve the nirvana of a well-configured PC?



◀ **FIG 2** IF YOU CAN'T RESERVE ISA RESOURCES IN YOUR BIOS YOU COULD ALWAYS TRY RESERVING THEM VIA DEVICE MANAGER'S COMPUTER PROPERTIES. HERE, I'VE RESERVED IRQ 5 FOR SOME REASON



channels in the same way using this menu – the SoundBlaster AWE-32 needs a pair and I could have reserved DMA 1 and 5 for it, marking them as ‘spoken for’ by ISA devices. Having made the changes, I saved them to CMOS, rebooted Win98 and we all lived happily ever after [Fig 1]. If your BIOS isn’t helpful, refer to Fig 2.

■ An out-of-box experience

You may believe that the brand-new PC you have just unpacked from its box is in optimum condition and incapable of better performance. How can it be anything otherwise given its pristine, factory-fresh condition?

If only that were true. Any volume manufacturer will ship its PCs with the default settings that it thinks will suit most of its customers’ needs. There’s no margin left these days to accommodate personal settings and in any case the condition of the PC is largely out the manufacturer’s hands thanks to the stringent contract terms on which Microsoft insists when makers want to pre-install Win98. The final straw is that your factory-fresh PC is unlikely to have the latest drivers and patches – Compaq Deskpro EPs still ship with Win95!

So how do you achieve the nirvana of a well-configured and bang up-to-date PC out of the box? The key is to get an internet connection up and running, pronto. This allows you to run Windows Update and thus you’ll be able to get hold of such essentials as DirectX 6.1, the Media Player and the Y2K update as well



◀ **Fig 3** THERE’S MORE THAN ONE WAY TO TWEAK A BIOS AND TWEAKBIOS (AVAILABLE FROM ALL THE USUAL SHAREWARE SITES) LETS YOU TWIDDLE WITH YOUR BIOS SETTINGS IN A PRETTY COMPREHENSIVE MANNER

as a range of other fixes and add-ons. If you have gone down the Windows NT 4.0 route, get hold of Service Pack 4 and install it without delay (although, because of its size, this is perhaps best installed from a CD).

The next thing to check is your installed hardware to see exactly what you’ve got fitted in your PC, and then check out the manufacturer’s web site for more up-to-date drivers.

Windows Update is supposed to offer an updated driver service to automatically

manufacturer’s version has more recent, better optimised drivers which offer more functionality? There’s only one way to find out...

Windows 98 makes it a lot easier to check out the version number of device drivers and this helps you establish the freshness or otherwise of your installed drivers. Simply open Device Manager, select the Driver tab and click the Drive File Details button. Do this for every device and make a list of version numbers. Armed with this, pay a visit to the manufacturer’s web site to see if anything more modern is available and, chances are, there will be. Video drivers are one example of a class of driver that is updated with monotonous regularity.

Talking of display adapters, make sure you’re getting your full half-pennyworth out of your monitor. If it is was a Plug-and-Play monitor, Windows 98 should have correctly installed it. If not, manually select your make and model of monitor in Display Properties.

Some monitor makers will have updated .INF files so this is worth investigating. Correct installation is important if you want to get the maximum resolution from your monitor; some still ship set to 640 x 480! And check the settings on your monitor while you’re at it. Once you have set your preferred resolution, adjust the image horizontally and vertically to almost fill the screen and make any corrections to the geometry.

A QUICK LOOK AT MERCED

If you’re interested in what Merced’s going to look like and can’t wait for it to be launched (when/if?), troll over to www.theregister.co.uk, home of ‘feisty’ computer newsletter, The Register. You’ll find a number of slightly fuzzy images of the next generation IA-64 CPU there. In the flesh, the CPU measures about 5 x 3in and is encased in a heat-conducting metal alloy enclosure. It’s not a ‘Slot 1’ device but plugs into a 560-pin PGA socket on the motherboard.

► **Yes, this is what an IA-64 CPU will look like; completely different to any other Intel processor**



Another area through which you should take a wander is your CMOS setup which almost certainly will not have been optimised in any way. Understanding some of these settings, especially the memory timings and what have you, requires a masters degree in rocket science. Consequently they are best avoided. However, lots of the other settings are fairly easy to get a handle on. In any event, it's fairly painless to revert to the previous settings if something 'untoward' happens.

There are several things you might like to change. One such item is the boot sequence. Many BIOSes now let you boot from a SCSI drive, even with an IDE drive installed. Some let you boot from a CD, which is useful if you want to install NT 4.0 or Linux. So, check this setting.

You may also want to twiddle with the block mode. This is the way the hard disk is accessed. It should be set to auto if possible. Yet another setting you'll want to change if you use parallel port devices is the mode of the parallel port. Change it from Standard to Enhanced Parallel Port (EPP) or Enhanced Capabilities Port (ECP). Experiment with both to see which works best with your hardware.

■ **USB 2.0 on the way**

By the middle of next year we could be seeing PCs shipping with a much faster version of USB. Work on the USB 2.0 specification has already begun and we'll probably see a final draft in September. It will offer between ten to 20 times the throughput of USB 1.1's 12Mbps — that is a data transfer rate between 120 and

240Mbps. Some US sources have speculated that the bus could deliver even more throughput, perhaps as much as 300Mbps.

What about 1394? Well don't hold your breath. If it pans out the way Intel has predicted, 1394 will become a consumer electronics technology used to interconnect home entertainment systems, digital cameras and the like.

All this emerged at the recent Intel Developers' Forum in Palm Springs. Intel's Pat Gelsinger [Fig 4] laid out an I/O road map for the next few years which, surprisingly, really didn't feature 1394 at all. If Intel has it's way, 1394's high-speed I/O technology won't feature in future PCXX specifications and as a result it'll be a cold day in hell before we see 1394 incorporated as standard in an Intel chipset, as Ultra DMA and USB have been.

Gelsinger predicted that 1394 could well become a niche technology. Whether or not it does depends largely on the extent to which users will want to connect non-computer peripherals such



▲ **Fig 4** ISN'T THE NET A WONDERFUL THING? HERE IS INTEL'S PAT GELSINGER IN FULL FLOW, IMMORTALISED ON A NETSHOW VIDEO AT THE RECENT DEVELOPERS' FORUM FOR USB 2.0

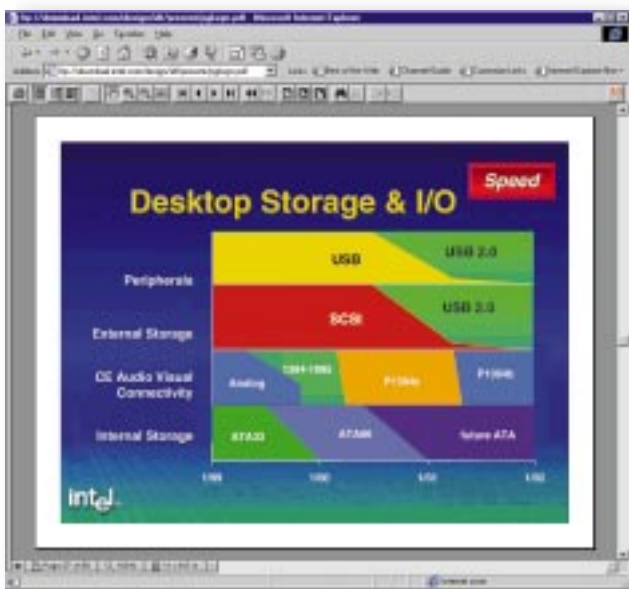
offering between 800Mbps and 1.6Gbps.

I guess we were never destined to see 1394 printers and scanners as the standard was always going to be more relevant to high-end devices, anyway. Certainly few current computer peripherals need that kind of throughput and most will be happy with what USB 2.0 has to offer.

Intel sees no major changes in desktop I/O for the next five years or so, but mainly refinements of existing technologies. It maintains that internal storage requires its own private bus and that this will be a further refinement of Ultra DMA using the ATAPI protocol.

ATA66 (a.k.a. Ultra DMA/66) will last through to about 2001 to be replaced by 'Future ATA' which, Gelsinger predicted, will feature a 1Gbps throughput. Interestingly, despite all the developments in SCSI Intel sees it being superseded, for external storage at any rate, by USB 2.0 by the year 2001 [Fig 5].

You can check out the full contents of Pat Gelsinger's presentation at developer.intel.com/design/idf.



◀ **Fig 5** ONE OF GELSINGER'S POWERPOINT FOILS OUTLINING THE FUTURE UPTAKE OF USB 2.0

PCW CONTACTS

Roger Gann welcomes your comments on the Hardware column. Contact him via the PCW editorial office (address, p14) or email him at hardware@pcw.co.uk



Do the write thing

Writing to CD is now **cheap and easy**. Steven Helstrip goes on record.

Your home-grown recordings should be sounding heaps better if all the suggestions from the past three *Sound* columns have been put to good use — it just takes a hint of compression and some EQ to make a world of difference. This month, as promised, I am going to look at how to get those recordings onto CD as cleanly as possible. I have also taken Yamaha's newest rewritable drive for a spin.

Until relatively recently, producing a CD required some serious cash investment. These days, however, you can get your hands on a CD writer for less than 200 sheets — about the price of a decent cassette recorder.

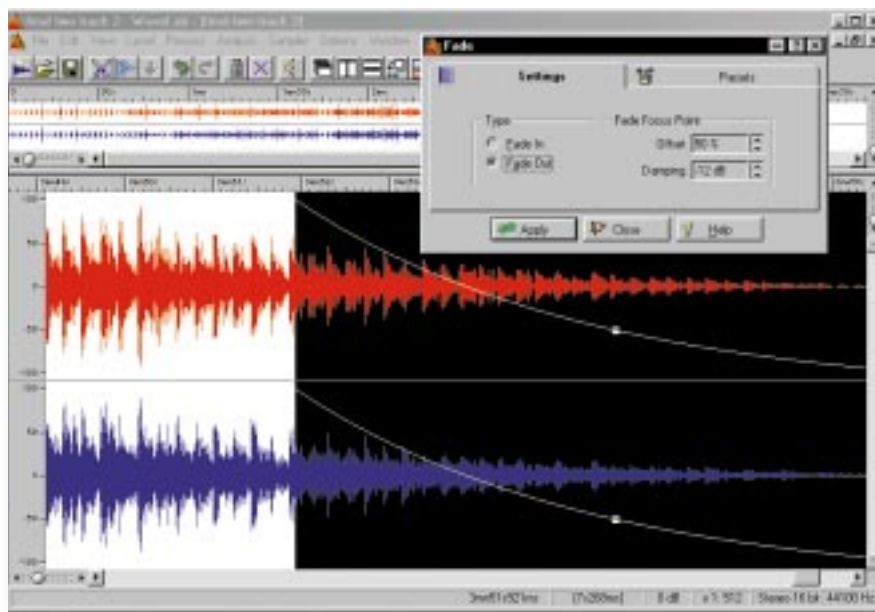
Strange though it may be, blank CD-Rs are now cheaper than most audio cassettes and offer far greater flexibility. When I master a CD, for instance, I create a mixed mode disc and archive my sequencer arrangements, audio files, softsynth patches and even an image of the CD inlay to the data partition. This leaves plenty of room on my hard disk to start a new project. So how is it done?

First steps

Once you have a mix you're happy with as audio tracks in your sequencer (*refer back to the February issue column for the full low-down*) listen to each track in turn and remove any unwanted noise such as background hum from microphone recordings.

If you have a noise gate plug-in, multiple instances can be inserted on the worst offending channels until your PC runs out of steam. Alternatively, snip out the noisy sections by using the scissors tool, paying particular attention to quiet passages.

If you're planning to fade out your track towards the end, don't worry about inserting volume envelopes in your sequencer; this is far easier to achieve



▲ **Fig 1 To CREATE A GENTLE LOGARITHMIC FADE IN WAVELAB, TRY AN OFFSET OF 50 PERCENT WITH -12dB DAMPING**

with an audio editor once the arrangement has been recorded as a standard stereo wave file. Most audio programs have a 'mixdown to stereo' facility that does this for you: in Cubase, set the locators to the start and end of your song and select Export Audio from the file menu; in Cakewalk, the command is Mixdown Audio, which can be found under Tools.

To be compatible for CD audio, the wave file needs to be saved in 16-bit stereo with a 44.1kHz sampling rate. If you have used sequencer effects and

automation, these options should also be checked in the mixdown windows.

Once the mixdown is complete, listen back to ensure that no unusual side effects have crept in and load the track into your sound editor. From there you can apply a fade-out if necessary and trim the intro. Remember, though, that some CD players don't instantly spring into play mode so it's best to leave around 50ms of silence just before your audio begins, otherwise, you may lose a

slice from the beginning of your songs when skipping from track to track. When it comes to applying the fade, bear in mind that a logarithmic curve will sound more natural than a straight linear fade [Fig 1].

I generally set the fade over six or seven seconds depending on the material. To ensure as much signal goes to CD as possible, normalise the track to 0dB before saving. You may even consider applying compression to the overall track or a master EQ. Given the effects of compressions, though, it's best to do this before applying a fade.

Writes and wrongs

Unlike data CDs, audio discs need to be written in one go (or session). But if anything should go wrong before the session is closed the disc will be rendered useless. So that you don't waste more discs than necessary, I have outlined below the potential pitfalls and how best to avoid them.

- One of the main reasons why disc writes fail is due to contamination of the

You can get your hands on a CD writer for less than 200 sheets



YAMAHA CRW4416SX DRIVE

disc surface; it only takes a speck of dust and it's 'game over, man'. To avoid this, don't remove a blank CD-R from its case until needed and, just as importantly, never touch the write surface.

- CD writers have a buffer (usually 1 or 2Mb) where data is stored before being written to disc. If your PC doesn't keep up with the recorder, the buffer runs empty; the dreaded buffer under-run. If this error message is reported, and it's not that uncommon, try disabling any programs that may interrupt the writing phase. These include screensavers, power management utilities, CD auto insert notification and even fax software.

- Burning CDs requires a continuous stream of uninterrupted data, so you should ensure that your hard drives are defragmented. Do not use your PC for anything else while writing is in progress. But if all else fails, try reducing the write speed from 4X to 2X, or from 2X to 1X.

Yamaha introduced the first ever recordable CD drive back in 1989, so it comes as no surprise that it leads the way today. **The 4416 is a tray-loading device capable of writing and rewriting at quad speed, while playback is a respectable 16-speed.** It comes in either SCSI or IDE configurations and there's an external model for SCSI, which is the drive under scrutiny here. Although the most expensive, external drives have a big advantage: they can be switched off when not in use, which prevents them from overheating.

The external case is only just bigger than the drive itself and provides a switch for power, SCSI ID select, and two SCSI 2 connectors. The first thing I noticed about the 4416 is how quiet it is; other drives I have used sound like they might take off once they reach 16 speed. As you would expect, all the main CD formats and writing modes are



supported and there's an essential 2Mb buffer to prevent under-runs. In the six weeks I've been using this drive, I have had a 100 percent success rate.

The package includes one CD-R, one rewritable disc and a copy of Adaptec's Easy CD Creator. With a typical street price of £349 it's not the cheapest drive around, but if you're looking for a solid workhorse I'd highly recommend it.

➔ **Price** £410 (£349 ex VAT)

Contact Yamaha 01908 368872

Questions & answers

Q I have been using Cubase VST for MIDI and audio sequencing for several months without

problems but since having upgraded my AWE-64 Gold to a SoundBlaster Live! I'm having trouble with synchronisation. When I playback my Cubase arrangements, audio and

MIDI start in sync but drift apart after about a minute into the track. I have experimented with different buffer sizes and have increased the pre-roll setting in the Sync menu but to no avail. Have I missed something?

NEIL PERRING

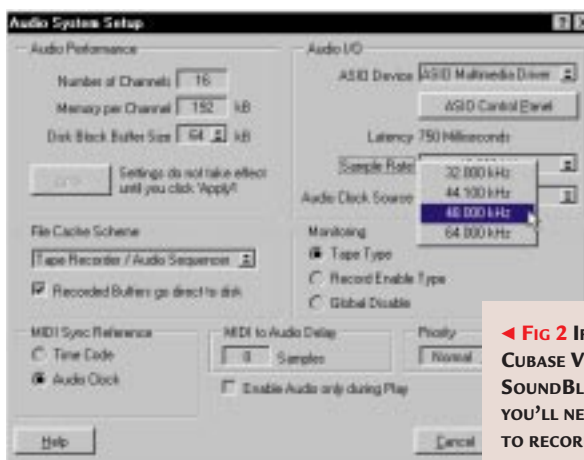
a Cubase uses your sound card's digital clock as a time reference to sync MIDI tracks to audio. From what you've described, it sounds as if the problem is related to the SB

Live!'s clock output, which is fixed to 48kHz. If your previous arrangements were recorded at

the default 44.1kHz sampling rate, drifting will occur over time. The first thing you need to do is set Cubase to operate at 48kHz to match the sound card (Audio System Setup dialogue — see Fig 2). This will ensure that new songs sync-up correctly. To play back your old arrangements in sync, you will need to convert, or resample, the audio tracks to 48kHz and reload them into your songs. Most audio editors have this facility.

PCW CONTACTS

Steven Helstrip welcomes your feedback on the Sound column; it's music to his ears. Contact him via the PCW editorial office (address, p14) or email sound@pcw.co.uk



◀ **FIG 2** IF YOU USE CUBASE VST WITH A SOUNDBLASTER LIVE!, YOU'LL NEED TO SET VST TO RECORD AT 48KHZ



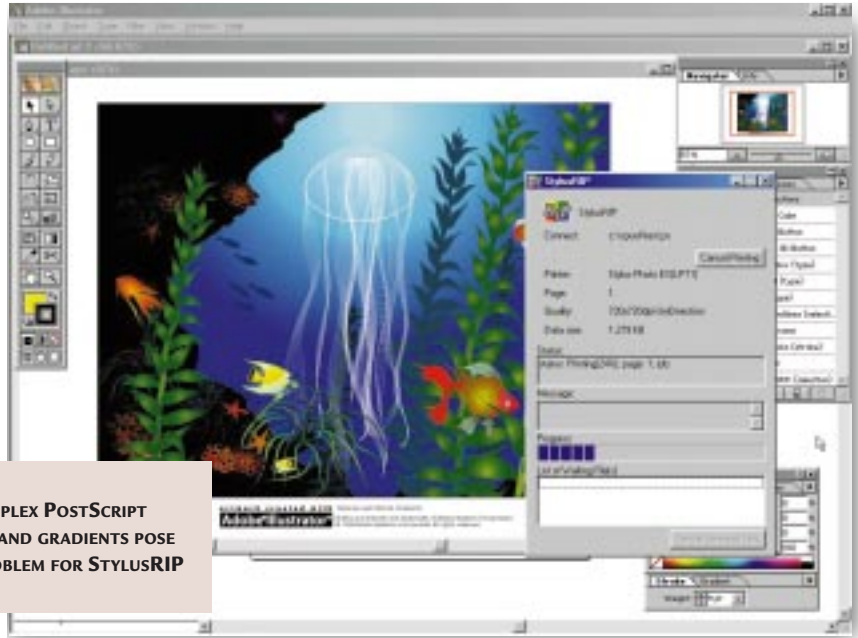
Do it in Stylus

Ken McMahon looks for **low cost** PostScript printing with StylusRIP.

You might recall that last month, while on the hunt for a cheap alternative to a colour PostScript printer I happened upon Aladdin GhostScript 5 which proved better than I expected — mainly because it worked when I hadn't expected it to. In other respects, though, it was pretty limited. There had to be a better solution — which didn't involve spending the kind of money that would be put to better use on a month's holiday in the West Indies, a decent hi-fi, or a superbike — and Epson looked like it might have it.

Epson's level 2 PostScript rip, StylusRIP, in combination with the A3 Stylus Photo EX, seems to have it all. A proper implementation of genuine Adobe PostScript and larger-than-A3 output means you can create bleed proofs with trims and photo-quality reproduction. Combined with good quality paper and colour management, for less than £500 you have a workable alternative to Epson's Color Proofer 5000, so called to reflect the price. And if you already have an Epson colour printer, StylusRIP works with the Photo, Color 800, 850 and 1520, you only need £129 for the software.

► **COMPLEX POSTSCRIPT BLEND AND GRADIENTS POSE NO PROBLEM FOR STYLUSRIP**



StylusRIP comes on a CD with an accompanying floppy disc. There is a once-only install process that downloads an 'updater' (software dongle) to an Eprom in the printer, and driver software is loaded onto your PC from the CD. My suspicions that this was not going to be trouble-free were initially aroused by the unclear and confusing documentation.

this problem many times before, so I wasn't all that surprised, but had a feeling that the two things were related.

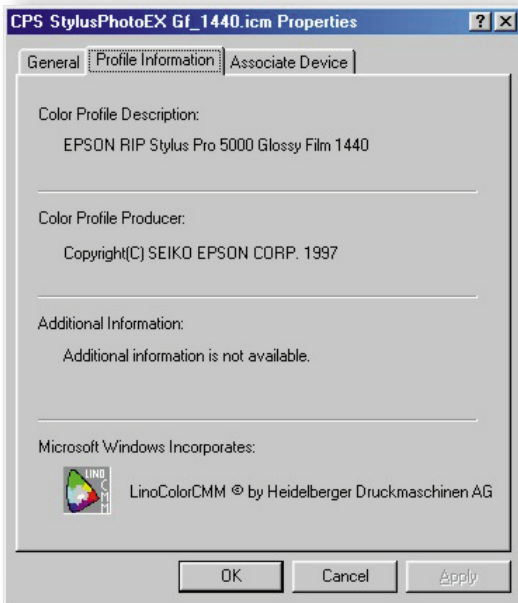
Call number one to Epson's tech support failed to get to the route of the problem after going down all the obvious avenues. Eventually, somebody at Epson suggested it might be the cable. As I had been able to print this was the last thing that would have occurred to me — ah, but if it's an old cable it might not be bi-directional, came the reply.

I didn't have another cable around, so I had to go and buy one. The watchword when you're buying a parallel printer cable is 'IEEE1284'. If it's compliant with that standard then it's bi-directional and when your PC talks to your printer the printer can say 'hello' back. With my goodness-only-knows-how-ancient cable, there was nothing but a rude silence — roll on USB.

With the new cable fitted, Status Monitor worked fine, but unfortunately StylusRIP was still not co-operating: with this you do not print directly from your application but, as with GhostScript, you first have to 'print' the PostScript file to disk using the PostScript driver supplied. In practice, this doesn't make a lot of difference as you just 'print' the

My initial problem was that the PC wouldn't communicate with the printer, despite the fact that I could print a test page (and anything else come to that) using the Windows driver. Furthermore, Epson's printer control panel, which allows you to check print head alignment, clean the nozzles and informs you about the ink levels in the cartridges, wouldn't play ball. I've had

◄ **INSTALLING COLOUR PROFILES FOR THE STYLUS PHOTO EX: THESE ARE THE SAME AS FOR THE MORE EXPENSIVE PRO 5000 MODEL**



Questions

& answers

Q I enjoy PCW very much and I especially like your new look. Could you tell me the name of the body typeface that the magazine now uses and

from where it can be sourced? Thank you in anticipation.

NICK MULCAHY

A You can find out for yourself from the PCW CD-ROM which contains all of the Hands On columns as Adobe Acrobat pdf files. For a list of all the fonts used in the

document just select file/document_info/fonts. The typeface in question is ITC Legacy Sans — a modern face designed by Ronald Arnholm in 1992 and based on Jensen. The serif version is used in our boxouts and as a body copy font throughout the rest of the magazine. According to Adobe 'this type has easy-to-read

character shapes and comfortable proportions which make it very legible for a sans serif typeface. It has open counters and a modestly-proportioned x-height which make it readable without being overpowering'. You can find out more about it at www.adobe.com/type/browser/F/P_362/F_LEGA-10004000.html

document to the StylusRIP spool folder and it takes over from there. Or rather, it sits there and does nothing.

I tried several approaches. The first was to print a simple bit of display type from CorelDraw 7. When the file is saved to disk in the spool folder, StylusRIP recognises it for what it is and begins to rip it through to the printer. The first time I tried this, a progress bar appeared and my simple document was printed in about a minute — except it wasn't. StylusRIP had gone through the motions and was happy it had printed my file yet the printer hadn't so much as flickered an LED throughout the entire process.

Further attempts to print with various applications and by a variety of routes produced even less success. Eventually, StylusRIP rightly decided it was a waste of time printing jobs that disappeared into thin air and simply queued them, while at the same time displaying a belligerent 'status - idle' message. What I did next, I know, will gain me no friends among readers of this column, but you have to understand, I was desperate. I phoned Epson and asked them to send me a Mac version of StylusRIP.

You're not going to like this, but installing StylusRIP on a Mac couldn't have been more different than on my first attempt: within ten minutes I had the software installed and was printing PostScript directly from any application that took my fancy. I wonder — has this anything to do with the Mac software

having reached the maturity of version 3.3 whereas the PC is a juvenile 1.10?

Buoyed up by my success I transferred the Stylus Photo EX back to PC, called Epson Technical support and began a new offensive. The first suggested line of attack was to delete everything from the original spool folder c:\stylusrip\tmp and create a new spool folder c:\spool. No joy. Next, it was suggested that the parallel printer port settings in the bios might be the problem and, sure enough, changing from ECP mode to bi-directional

impressed with StylusRIP. It is very quick, managing to print the troublesome Illustrator jellyfish picture on which both GhostScript and my Hewlett-Packard Laserjet 5000N choked.

Epson supplies ICC colour profiles for the Photo EX and other supported printers, as well as various paper options and Pantone colour charts in EPS and raw PostScript format, in addition to various application files. The only remaining problem is the cost of consumables. At around £12 each, the five-colour cartridges are more reasonably priced than they used to be and last a reasonable length of time. One problem though is that if you use a

What I did next will gain me no friends...

predominance of one colour you have to replace the entire cartridge, even though four of the chambers may be quite full, which is rather wasteful.

Another gripe is the cost of Epson's inkjet paper. The A3 stuff costs around £1 a sheet and I've tried other coated paper options without much success. Even if you did get a reasonable result and accurate colour is important to you, you'd still be stuck for ICC profiles.

All the same, with the Stylus Photo EX retailing at just over the £300 mark (ex VAT) and StylusRip at £129 (ex VAT) this becomes a very cost effective alternative to colour laser output from a bureau.



◀ CALIBRATED PANTONE COLOUR LIBRARIES ARE SUPPLIED, SHOWN HERE IN DRAW 7'S COLOUR ROLL-UP

did the trick. I'm sure the reason it was originally set that way was to get the Stylus Photo 700 working under Windows.

Initial teething troubles aside, I'm

PCW CONTACTS

Ken McMahon welcomes your comments on the Graphics & DTP column. He can be contacted via the PCW editorial office (address, p14) or email him at graphics@pcw.co.uk



Glass act

Benjamin Woolley creates **transparency and light** through stained glass.

A window (of the sort you find in a building rather than on a computer screen) is an essential architectural object. For the 3D artist it also represents an interesting challenge; one that raises important questions about the way light works in the virtual world of 3D graphics. So, I have decided to devote this month's column to creating a window — no ordinary window, mind, but a rather beautiful stained glass one [Fig 1].

I chose stained glass for three reasons: you cannot see through it, so I did not have to build an exterior; it provides an interesting exercise in using relatively simple modelling techniques to build what appears to be a complex object; and it shows how 3D software simulates — or, more accurately, fails to simulate — light passing through transparent materials. I also hope to throw some light (*sorry — couldn't resist it!*) on a range of topics relating to lighting, which will prove useful in a variety of contexts.

Firstly, here are a few tips on constructing the window itself and fitting the glass. The stained glass was scanned in from a picture I have of the window of Saint Thomas in Bourges cathedral in France — it is a vibrant, medieval masterpiece.

To fit the window, I needed to punch a hole the right shape in the wall, add the tapering surround and create the window pane itself. I did all this with the same basic 2D outline of an archway, traced from the scanned image of the window.

Some drawing packages (e.g. CorelDraw) include tools for tracing around bitmaps and turning their outlines into 2D shapes which can be exported to your 3D authoring package. Check first that there is an appropriate format for exchanging files between the packages. I used my 3D package which allows you to place a bitmap as a background in a viewport and then use

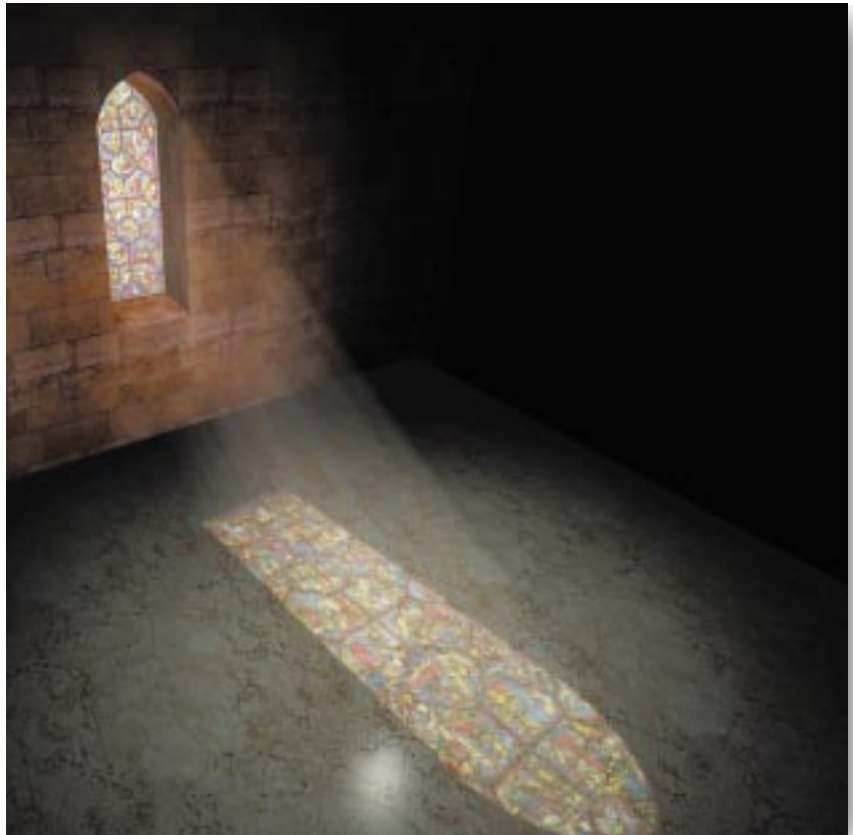
...I used this to cut a hole in the wall, using a Boolean subtract operation

the drawing tools to trace the outline. The resulting shape was a simple arch made up of lines connected by just five vertices. Keeping the number of vertices down was important because if there were too many, some of the following operations may have produced unpredictable results. I extruded this to create a 3D model with its cross-section matching the shape of the window and then tapered the resulting object to create the surround. I used this to cut a hole in the wall, using a Boolean subtract operation.

The 2D outline of the stained window image was also used to create the window pane, which was simply a flat plane with a matching cross-section. This meant that the image, applied as a texture, fitted perfectly.

Then came the tricky bit. Transparent objects created by most 3D packages behave differently to their physical counterparts.

For example, it is possible with many packages to apply a bitmap to an object as an 'opacity map'. Such a map is a texture which varies the transparency of the object according to the intensity of colour in the image — darker areas are treated as more transparent and lighter areas as more opaque. You might therefore imagine that if you used the stained glass image as an opacity map or, indeed, used a texture that was completely transparent, any light that was shining at the opposite (i.e. external) side of the wall would shine through the less opaque parts of the window and illuminate the interior of your scene.



▲ Fig 1
THE STAINED GLASS WINDOW, WITH TEXTURED WALL AND FLOOR

However, with the standard renderers used in many 3D packages, you will find that transparency is not quite the two-way process it is supposed to be. If you make a window out of a transparent material to simulate glass, either stained or clear, you can see out but a light source does not shine in. In other words, it is as though you have X-ray eyes which enable you to see through objects that are in all other respects solid and opaque.

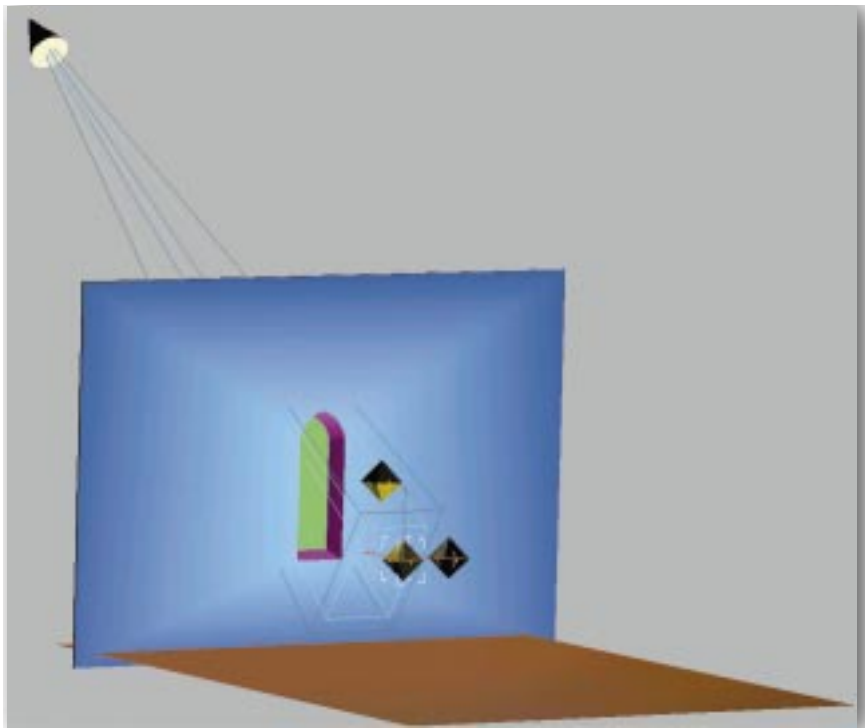
Raytrace renderers, which are slower but generally more accurate, should handle transparency better. However, when I used a raytraced material in the scene created for this exercise, the light projected into the interior through the window still failed to reach the floor, even when I made the window material completely transparent.

To create the effect shown in Fig 1, I decided to do what you nearly always have to do when creating 3D scenes — cheat. The light source shining through the window is a spotlight set behind the wall [Fig 2]. The light needed to be of the shadow-casting type (some are not; the light they cast passes through the illuminated objects as if they were not there) so that the silhouette of the window surround was cast on the floor.

However, to prevent the light now being blocked by the 'transparent' window pane I had to exclude it from the list of objects the light illuminated. This meant that the light from that spot passed through the pane as though it were not there. So, to get the stained glass pattern onto the floor, I made the spot a projector light, using the original bitmap of the stained glass window as



▲ Fig 3 THE TORII OF ITSUKUSHIMA TEMPLE MONUMENT CAN BE DOWNLOADED AS A 3D MODEL FROM WWW.GREATBUILDINGS.COM



▲ Fig 2 THE BASIC ELEMENTS OF THE SCENE. I HAVE PLACED DUMMY OBJECTS IN THE POSITIONS OF THE LIGHTS, TO SHOW WHERE THEY ARE. THE CONE IN THE TOP LEFT-HAND CORNER IS THE VOLUMETRIC SPOTLIGHT AND THE BLUE LINES INDICATE THE DIRECTION OF ITS ILLUMINATION. THE THREE TETRAHEDRONS CLUSTERED IN THE CENTRE OF THE SCENE ARE THE FILL LIGHTS — OMNIS AS OPPOSED TO SPOTS — WHICH CAST THEIR LIGHT IN ALL DIRECTIONS

the projected image. With just the spot to light the scene the interior was still invisible except for where the image of the stained glass window was projected onto the floor, so I had to add extra lights: one to light the interior of the window pane, to simulate it glistening in the sunlight, and two others to light the floor and the wall, simulating the ambient light reflected by the sunlight passing into the building.

Finally, because it made the rendering time a great deal longer so I wanted to get everything else right first, I added a very feint volumetric lighting effect to simulate the sunlight picking up dust in the atmosphere.

The lessons to be learnt from this exercise are that when you are creating an architectural interior you have to treat the light coming through a window, and the lighting and texturing of the window itself, as two separate items. And, the more you try to simulate a physical scene by matching the characteristics

of the materials within it, the less convincing the result is likely to be.

■ View great buildings for free

If you are interested in architecture, I would recommend that you head over to www.greatbuildings.com. There you will find not just a huge database of some of the world's finest buildings but also several that can be downloaded as 3D models. The list of constructions available in 3D ranges from the familiar Colosseum in Rome, to the less familiar but elegant Sir John Soane museum in London, from the ancient and exotic Torii of Itsukushima [Fig 3] to the modern and minimalist Villa Savoye in France. To examine these models, you will need a utility that can deal with files compressed using the Apple Mac Stuffit file format, and DesignWorkshop. The latter is described by its publisher, Artifice, as an 'architectural modeler'. You can download an evaluation 'Lite' version for free via the Great Buildings website but be warned, it is 7Mb.

PCW CONTACTS

Benjamin Woolley welcomes your comments on the 3D Graphics column. He can be contacted through the PCW editorial office (address p14) or by email at 3d@pcw.co.uk



Crystal tips

Tim Anderson looks through the **new elements** in Crystal Reports 7.

Most database projects need reports, and most developers will be familiar with Crystal Reports, the leading Windows report component. A version of Crystal Reports has been bundled with Visual Basic since version 3.0 although VB 6.0 has a new native report component and Crystal has been relegated to a dark corner of the installation CD. It is still there, though, under the Tools directory and for many projects is a better choice than the newcomer. The bundled version, also available as a free web download, is for VB 5.0 but it also works with VB 6.0.

For the real VB 6.0 version you have to buy Crystal Reports 7.0. The updated VB control supports the VB Data Environment and hierarchical datasets but there is more in the package than just a new component. Particularly interesting is the Crystal Web Reports Server, which supports Java, ActiveX or plain HTML clients.

At the heart of the package is the Crystal Reports Print Engine. It is a library called CRPE32.DLL which has the dubious distinction of being the largest DLL in many windows installations and is now more than 5Mb. If you prefer to work close to the metal, you can call the Print Engine API directly but Seagate provides numerous higher-level tools. The starting point is the report designer

[Fig 1] which lets you define the database connection for a report and lay out the fields and sections. There is support for sub-reports, cross-tabs, parameters, formulas and charts.

With the product now at version 7 the feature set is extensive although report design has a habit of raising awkward problems that may require compromises. Reports are saved as files which can then be displayed programmatically or opened by the user.

There are several options for developers who need to integrate Crystal Reports into an application. In Visual Basic you can use the ActiveX Designer, a wizard that sets up a database connection, opens a report designer and adds a report viewer to the project, along with code that displays the report.

The viewer is a component that sits on a VB form complete with a navigation tree that lets you jump quickly to any report section. This makes for better integration than was possible with early versions, although you still cannot place standard VB controls on a report. The ActiveX report does support a Format event for which you can write VB code.

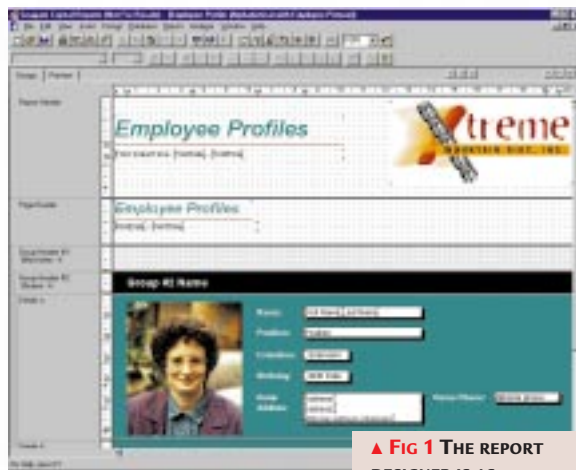
This is an easy route to adding a report to a project but less flexible than the traditional approach which involves creating report files using the full Crystal Reports designer,

and using the Crystal ActiveX control to load and manipulate the report. Other ways of programming the report engine include an automation object model, a class library for C++, and a VCL component for Delphi.

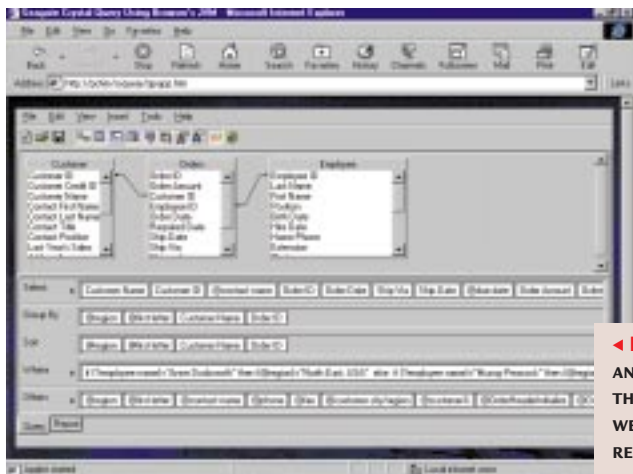
The interesting features in Crystal Reports 7 are for web applications and there are several options. One is to use Active Server Pages, the dynamic web page technology in Internet Information Server, and to create report pages using Crystal's automation interface to poke reports into an ActiveX or Java viewer. An easier way is to run the Crystal Reports server which can be programmed using Microsoft or Netscape web server API (ISAPI or NSAPI), or CGI scripts. The client can be plain HTML, or an ActiveX or Java viewer. I tried this with Internet Information Server and was impressed with the ease of setup and the results.

Seagate has made the different viewers similar in appearance and functionality. For Java, the supported clients are either Microsoft's JVM in Internet Explorer 4.0 or higher, or any browser using Sun's Java plug-in. The server needs additional licenses for each simultaneous user.

Customers who use reports typically want a large number of variations, which can result in hours of tedious editing in Crystal's designer. You can reduce this to some extent by using report parameters



▲ FIG 1 THE REPORT DESIGNER IS AS COMPREHENSIVE AS YOU WOULD EXPECT FROM A VERSION 7.0 PRODUCT



◀ FIG 2 CRYSTAL QUERY IS ANOTHER JAVA APPLLET; THIS TIME FOR DESIGN AS WELL AS A PREVIEW OF REPORTSEXCEL



or programmatically altering selection criteria but not all variations can be accommodated this way. The answer, at least with users who do not mind doing a little work, is to provide a way for end-users to create their own reports.

You can now do this over an intranet or on the web using Crystal Query [Fig 2], a Java application which lets you open, amend and save standard Crystal report files.

Seagate supplies an installer which you can download and

execute locally so that the application classes end up on the client for better performance. The installer will kick in again whenever the client needs to be upgraded.

Seagate's Crystal Reports has evolved into an impressive suite of reporting applications. Developers and end-users are well served, and the web application features are particularly good.

■ Visual Café society

An interesting question arose in a letter from reader Mark Jackson: 'I am currently trying to implement a web database in Visual Café. The problem is that I've managed to create an applet linked to an Access 97 database using the project wizard but it isn't reading in any data and all the fields are blank. I would be extremely grateful if you could run me through the steps needed to develop a database, accessible via the web.'

Visual Café's data access is via JDBC, the standard Java database API.

Microsoft has not implemented a JDBC driver for Access but there is an ODBC driver which opens up Access databases to any application that can use ODBC.

Sun provides a JDBC-ODBC bridge so you can use ODBC from Java. Sounds good? Well, it isn't and Mark has discovered one of the problems.

First, here is a look at the Visual Café databound project wizard [Fig 3].

- Step one is to choose a project type, the options being Applet, JFC Application, JFC Applet, or Application. JFC stands for

Java Foundation Classes, also known as Swing and the JFC options are much better looking. The

problem is that Swing is not fully integrated with the JDK (Java Development Kit) until version 1.2, which most browsers do not support unless you use the Java Plug-in available from Sun.

Worse, at the time of writing and despite having 'JDK 1.2' printed on the box, Visual Café 3 only really supports JDK 1.1.7 — so, for an easy life choose the Applet.

- Next, choose a data source. If you have not yet set it up, now is the time to configure an ODBC data source for your Access database. Use the 32-bit ODBC administrator in Control Panel and add a new data source, choosing the Microsoft Access driver, On Windows NT set this up as a System data source. The Access driver raises a dialogue with a Select button and here you can choose the .MDB file containing your data [Fig 4].

- Back in Café, choose Define another data source and you will find your connection listed in the JDBC-ODBC Bridge section. Select it and then select the table or query you want to use, ignoring the Access system tables with strange names like MSysAccessObjects.

- Next, Café asks you to choose the columns or fields from the table. Another step lets you assign components to each field. Visual Café

tends to default to TextArea but TextField is more suitable for most fields.

- When you finish, Visual Café builds an applet that has basic functionality including navigation, search, new and save [Fig 5].

This should run fine in the AppletViewer but applets are for web pages. To create a host web page you can use Visual Page as bundled with Café, or do it yourself in Notepad. As a minimum, you will need a line like this:

```
<APPLET CODE="PCWApplet.class" WIDTH=500 HEIGHT=370>
</APPLET>
```

(Key: ✓ code string continues)

You can get the width and height from the applet properties in Visual Café. Add the web page to the project using Insert -> Files into project. Now open

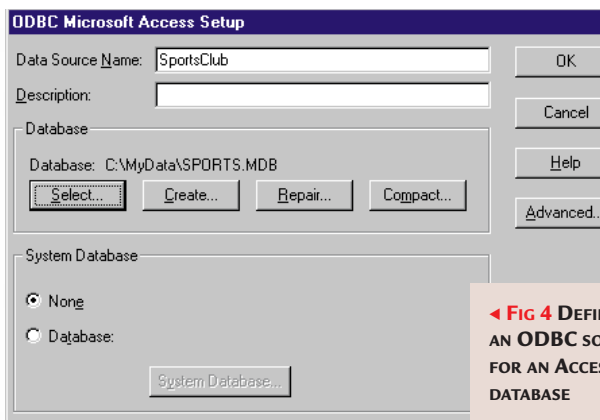


▲ FIG 3 THE DATABOUND PROJECT WIZARD IN VISUAL CAFÉ OFFERS A CHOICE OF FOUR TYPES

Project options and check the option to Execute in default web browser. Run the project and the form displays but the fields are empty, just as Mark discovered.

◀ What's wrong with the bridge?

The reason is a problem with the JDBC-ODBC bridge. This is no use for unsigned applets because it calls ODBC DLLs that run on the client, violating applet security. There are other reasons not to use it. The ODBC libraries are native code so cross-platform support goes out of the Windows. Its other major limitation is that the ODBC data source needs to be set up on each client. People choose Java to avoid exactly this kind of problem so it really is the worst of both worlds. Finally, it has a reputation for bugs and is unlikely to figure highly on Sun's fix-list.



◀ FIG 4 DEFINING AN ODBC SOURCE FOR AN ACCESS DATABASE



➔ The fix — run on the server

The solution is to call the ODBC libraries on the server rather than on the client. One way to do this is by using dbAnywhere, intermediate software which has a JDBC driver and which comes with Visual Café in the database edition. Your applet calls dbAnywhere, and dbAnywhere calls ODBC. Converting the example is simple.

1 First, run dbAnywhere. Next, run the Configure Data Source tool also found in the dbAnywhere group on the Start menu. The key fields in the dialogue are Engine, which must be set to Microsoft Access, and Server, in which you enter the name of the ODBC datasource. Make a note of the port number in the URL (usually 8889). Save and test the data source, close the configuration tool and switch back to Visual Café.

2 The next step is to edit the JDBC connection in your applet to use the new data source. Select the jdbcConnection object and edit the URL property. This opens the Insert Datasource dialogue. Choose New, select the Symantec jdbc driver, and enter the host name and port number for dbAnywhere. Note that you cannot use the default localhost for the IP name or address of dbAnywhere otherwise it will not work across a network.

Click Refresh to show the available data sources and choose the one you've tested. Run the applet again and it should display with a live connection to the MDB [Fig 6]. Note that to deploy this applet to a web server you need to ensure

that the browser can find all the necessary Java classes. Use Visual Café's deployment feature to create a jar (Java Archive) and add a corresponding ARCHIVE attribute to the APPLET tag.

3 The key step is to check the option Create Standalone Archive in the Project Option, Deployment tab, so that all the classes additional to the standard JDK are included.

The main snag with Visual Café is its instability. Already Symantec has a 43Mb patch which takes the database edition 3.0 to 3.0a. But even with this installed, the IDE is not robust on our test system. From time to time it crashes on startup, the fix being to start Visual Café from the command line with the '-clean' parameter which forces it to delete and rebuild various configuration files.

■ **More about Mutex**
Several readers have commented on the code in the March issue column which prevents multiple instances of an application.

The code was for Delphi but adapts easily to Visual Basic as reader Malcolm Whapshott emailed to tell me. Just to

recap, the idea was to call OpenMutex to retrieve the handle of an application-defined Mutex object. If the function returns zero, the Mutex is not defined so no previous instance is running. Next, the code calls CreateMutex so that other instances attempting to start will find that the Mutex object does now exist and will exit quietly.

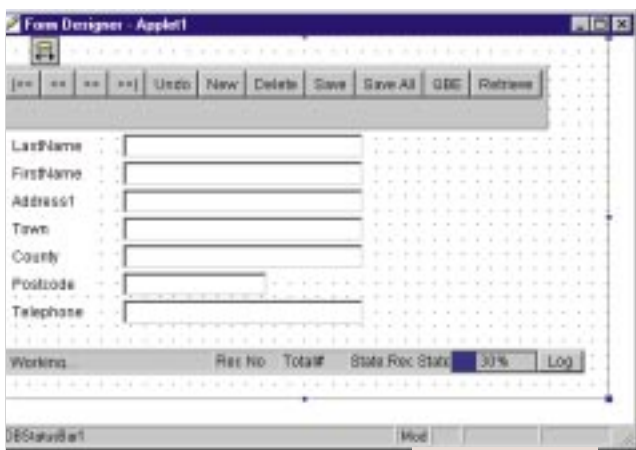
Reader John Bain describes 'a slight problem' with this approach: 'There's a potential race

condition between the OpenMutex calls. If two instances start at almost the same time there's a chance that both might call OpenMutex and have 0 returned before the first one gets to CreateMutex. CreateMutex will then return a valid

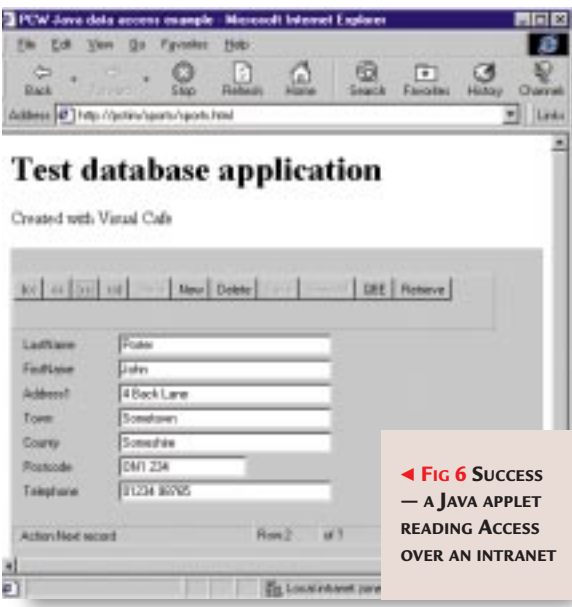
handle for both CreateMutex calls and you will have two instances running.

'The way around this is to exploit the fact that if you call CreateMutex with the name of a mutex which already exists, then a valid handle to the existing mutex is returned and GetLastError() returns ERROR_ALREADY_EXISTS. So, you just skip the OpenMutex calls and go straight to CreateMutex and then check GetLastError(). Only one instance can create the mutex so only one can have a GetLastError() other than ERROR_ALREADY_EXISTS. Hence no race condition.'

Another reader, Sam Edge, came up with a similar suggestion. Thanks to both of you and also for some other comments about instance detection and data sharing, for which I will try to find space in a future column.



▲ FIG 5 THE GENERATED DATA ACCESS APPLLET



◀ FIG 6 SUCCESS — A JAVA APPLLET READING ACCESS OVER AN INTRANET

PCW CONTACTS

Tim Anderson welcomes your feedback on Visual Programming and can be contacted via the PCW editorial office (address, p14) or email visual@pcw.co.uk
Crystal Reports 7 costs £363.07 (£309 ex VAT), or £139.83 (£119 ex VAT) for the standard edition from Contemporary Software 01344 873434. The web report server, automation interface and some other features are only available in the Professional version.
More details at www.seagatesoftware.com



Post restante

Bob Walder shows how you can pick up your email anywhere, from a standard browser.

Last month, I told you how to get your Exchange Internet Mail Connector (IMC) up and running and so by now you should be merrily sending and receiving mail via your very own SMTP/POP3 mail server. Many Exchange users will use the Outlook client, too, although with the internet mail support we installed last month that is by no means compulsory as any POP3/IMAP4 client can now be used to send and receive mail via your Exchange Server.

No matter which client you use, though, you can frequently find yourself incommunicado when you are out of the office without your desktop or notebook PC. You cannot simply walk up to any old PC and check your email using someone else's client. Well, you could but it would involve some serious reconfiguration as well as inconvenience to the owner of the PC you are borrowing.

There is a way around the problem, though. While you do not pick up your email from the mail server it simply resides there in limbo until you return to your office and download it again. By installing Outlook Web Access (OWA), you gain access to your Exchange mailbox over the internet using nothing more than a standard browser [Fig 1]. With Exchange 5.5 came additional support for OWA including contacts and

calendar support over the web, plus access to Public Folders.

The first step is to ensure that Internet Information Server (IIS) and Active Server Pages are installed and working correctly. The next is to ensure that the OWA components have been installed.

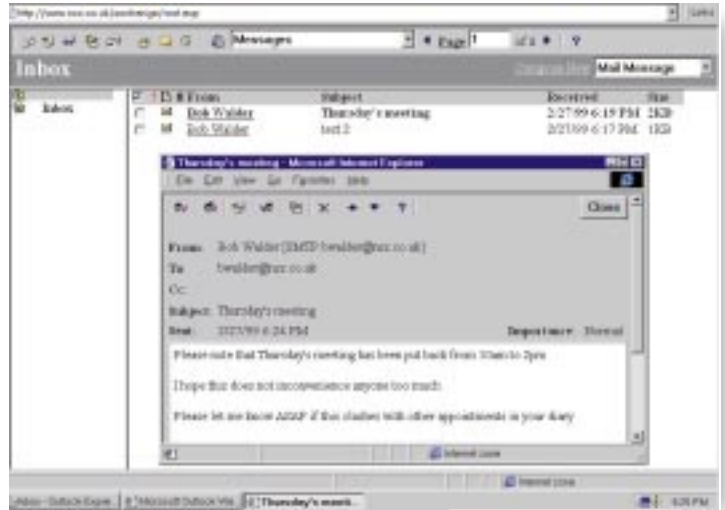
OWA must be installed on the same server as IIS and Active Server although this does not need to be the same machine which is hosting the Exchange Server accessed with these scripts.

Note that IIS 4.0 is not supported by the Exchange Server version 5.0 Active Server Components. [First] installing them both on the same computer results in error messages and the OWA client returns error messages. Exchange Server 5.5 does support Internet Information Server 4.0, though. To use Exchange with the OWA client you must install Exchange Server 5.5 before installing IIS 4.0.

■ Installing OWA

To install OWA on your IIS/ASP server, first insert the Exchange Server 5.x CD and then run server setup.

➔ **Select** custom install and the OWA option. If this is an existing installation, simply run the Set-Up program and select the Add/Remove Components option. ➔ **Select** OWA in the Options list and click Continue. This



▲ FIG 1 READING A MESSAGE USING OWA

will install the Collaboration Data Objects (CDO), the CDO Rendering library and various Active Server Pages and associated script files.

The next step is to configure Exchange Server to support the necessary protocols.

➔ **Log on** to the server as Administrator and start the Exchange Administrator program.

➔ **Expand** the Site container of the organisation tree and select the Protocols container. The key one here is the HTTP (web) Site Settings: double click on it.

➔ **Make sure** the Enable Protocol box is checked [Fig 2].

➔ **Confirm** the settings in the Anonymous Access section if you wish to allow anonymous users to access the public folders or browse the global address list.

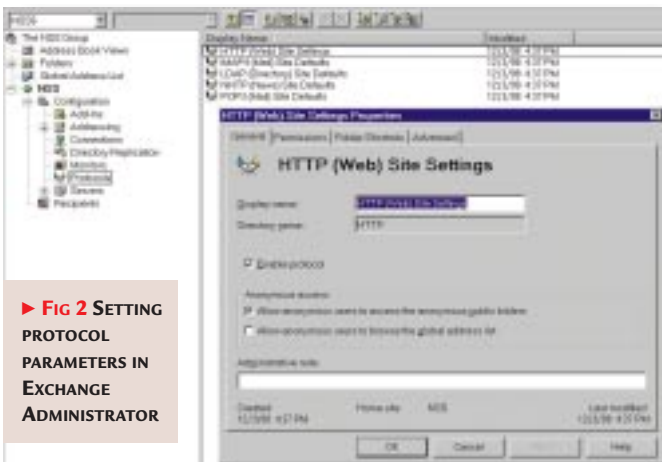
➔ **Click** on OK. Double click on the LDAP (Directory) Site Defaults.

➔ **The port** number should be OK. Check the Enable Protocol box.

➔ **Check** the Allow Anonymous Access box on the Anonymous tab. Strangely enough, even if you are not planning to allow users to browse your Exchange Directory using LDAP you still need to perform these steps to get OWA working.

➔ **Double click** on POP3 (Mail) Site Defaults.

➔ **Check** the Enable Protocol box. And do the same for IMAP4 and NNTP if you



► FIG 2 SETTING PROTOCOL PARAMETERS IN EXCHANGE ADMINISTRATOR



Bussing it

Confused now that Apple has adopted USB, wholesale? Make the connection, with Cliff Joseph.

A few months ago I looked at the implications of Apple's adoption of USB and promised to publish occasional updates on the availability of USB products for the Mac.

We're now starting to see quite a few printers, scanners and other devices that use USB, so availability of new peripherals isn't that much of a problem — except now there's a new problem to deal with.

Originally it was only the iMac that used USB but since then Apple has adopted USB across its entire range. All the new G3 Power Mac models have USB and FireWire ports built in and have completely done away with SCSI and the old Mac serial ports that

many users have existing SCSI drives and scanners, as well as serial port printers and modems that simply cannot be used with these new machines.

As a result, there's now a confusing array of adaptors and converters being advertised in magazines and on the internet. But most of these products have not yet



▲ LURID YELLOW USB-TO-SCSI ADAPTER FROM 2NDWAVE

reached the shops so in this month's column I am only going to look at products that are actually available here in the UK.

► **IMATION'S SUPERDISK IS THE ONLY USB FLOPPY DRIVE CURRENTLY AVAILABLE FOR NEW MACS**



Floppy disk drives

IT'S NOT AN ADAPTOR AS SUCH BUT MY FIRST RECOMMENDATION HAS TO BE THE IMAISON SUPERDISK. AS WE GO TO PRESS IT'S THE ONLY USB FLOPPY DISK DRIVE AVAILABLE IN THE UK. I KNOW ORDINARY 1.44Mb FLOPPY DISKS ARE ON THE WAY OUT BUT THEY HAVEN'T GONE YET, DESPITE WHAT STEVE JOBS SAYS. I'VE BEEN USING ONE OF THE NEW G3S FOR A COUPLE OF MONTHS NOW AND I COULDN'T GET BY WITHOUT THE SUPERDISK. AND, OF COURSE, IT ACCEPTS 120Mb SUPERDISKS AS WELL AS 1.44Mb DISKS. NEWER TECHNOLOGY AND TEAC HAVE BOTH ANNOUNCED PLANS TO LAUNCH A STRAIGHTFORWARD 1.44Mb FLOPPY DISK DRIVE BUT NEITHER PRODUCT HAD ACTUALLY SHIPPED BY THE TIME THIS ISSUE WENT TO PRESS. I OMEGA'S USB ZIP DRIVE IS AVAILABLE AND WORKS PERFECTLY WELL, BUT IT IS NOT COMPATIBLE WITH ORDINARY FLOPPY DISKS, SO IF YOU NEED TO SHARE FILES WITH OTHER MACS OR PCs THAT STILL USE FLOPPIES THE SUPERDISK IS YOUR BEST OPTION FOR NOW.

were used to connect to printers and modems. And, like the iMac, they don't have floppy disks built in, either.

The iMac is aimed at first-time users who will, presumably, be buying brand new USB peripherals to go with their brand new iMac. Yet most of the people buying the new G3 Power Macs are upgrading from an older Mac, so

Printers

After floppy disks, the next most common question I get is about connecting printers to USB Macs. Epson and Hewlett-Packard both produce adaptors that will allow you to use some of their existing printers with USB Macs, but if you want to use a printer from any other manufacturer, you'll need an adaptor that will connect a USB port to a standard PC printer port.

These are available from Entrega and Infowave but Entrega's USB-To-Parallel Printer adaptor currently only works with Epson printers, and even then you have to download new printer drivers from Epson's web site. That's not entirely Entrega's fault, as it's actually Apple that has been taking its time releasing the Mac USB driver software that Entrega's products need.

Right now, though, you're better off looking at InfoWave's PowerPrint, which comes with a CD-ROM containing drivers for a wide range of printers. You can check the compatibility list at www.infowave.com to see whether or not PowerPrint supports your particular printer.



IMAC CONNECTIVITY

Most Macs produced in the past few years have Ethernet built-in as a standard feature, which makes it easy to network Macs together. However, I've had a number of enquiries from readers with models such as the Mac Classic and LC, which don't have Ethernet and who need to connect the older Mac to a new iMac, either for file-transfer or to share a printer.

Apple seems to have given no thought at all to this problem. Fortunately, though, there is a third-party solution.

Older Macs which do not have Ethernet interfaces can use Apple's own networking system called LocalTalk, and networking specialist, Farallon, has come up with a device called the EtherMac iPrint Adapter LT which is able to act as a bridge between LocalTalk and the iMac's Ethernet connector.



The iPrint is an adaptor which can connect to the iMac's Ethernet interface at one end and also has an RJ-11 port that can accept a PhoneNet cable. You use PhoneNet cables to connect to one of the serial ports on the older Mac model and then use the Mac's built-in filesharing facilities to share files. The iPrint adaptor can also connect to a variety of printers allowing

you to share a printer between the two Macs. However, there are different versions of the adaptor for use with different types of printer, so

you should check which version you need before buying.

If the idea of Mac networking seems a bit daunting, there are some useful getting-started guides on Farallon's web site at www.farallon.com.

➔ EtherMac iPrint Adapter is £90 (ex VAT) from Principal Distribution on 0175 6704000.

If your printer only has a Mac serial port, or you want to use a device such as a modem or digital camera that requires a serial port connection, you need to look at Keyspan's USB-To-Serial-Adaptor. There are versions available with one, two or four serial ports built in, although the two-port version that mimics the standard two ports on older Macs will be best for most people.

There is now a confusing array of adaptors and convertors

■ SCSI devices

Before USB came along, all Macs had SCSI interfaces and there must be thousands, if not millions, of Mac users who have SCSI scanners and hard disks that are incompatible with USB Power Macs.

When it launched the new G3s, Apple did say that it would be supplying a low-

cost PCI card that would provide a SCSI interface. Take a look at Apple's US web site and you'll see the card listed as an option, for \$49. However, this card is actually supplied by Adaptec and UK users will have to buy it direct from

Adaptec. The company's PowerDomain range of SCSI adaptors includes two new cards

called the PowerDomain 2930 and 2906. The 2906 is the cheaper of the two: unfortunately, it costs £49 (ex VAT) in the UK, compared to \$49 in the US. It provides 10Mb/sec throughput, which should be adequate for devices such as Jaz and Zip drives. If you've got a scanner or a high-end AV disk that needs even higher performance you'll be better off with the 2930 model. This costs £99 (ex VAT) but runs at 20Mb/sec.

Of course, iMacs do not have PCI slots so your only option for using SCSI devices is the SCUS-Bee from 2ndWave. This is a USB-to-SCSI adaptor, moulded in a rather lurid yellow plastic, and costs £70 (ex VAT).

■ USB

Finally, it is also worth remembering that there are still plenty of people with non-USB Macs who are missing out on all these handy little USB printers, cameras, and other devices. If you have got a spare PCI slot in your Mac you can install an adaptor card that provides you with either two or four USB ports.

Keyspan's USB upgrade card provides two USB ports and costs £59 (ex VAT). Entrega produces an even cheaper two-port card which sells for only £29.99 (ex VAT) and a four-port card for £59.99 (ex VAT).

The catch here, though, is that as we went to press only Keyspan had the official Apple USB drivers which are needed to upgrade pre-USB Macs. Entrega assured us that it would have the final drivers by the time this column was actually in print, but check with the company before buying its cards. And, be aware if you download the drivers from Apple's web site — if they are just beta drivers, Apple will not provide technical support.

So be warned — do not buy the card if the drivers are not actually included in the box.

PCW CONTACTS

Cliff Joseph welcomes your feedback on the Mac column. He can be contacted via the PCW editorial office (address, p14) or by email at mac@pcw.co.uk

2ndWave SCUS-Bee is £70 (ex VAT) from AM Micro 01392-426473

Adaptec PowerDomain 2930 is £99 (ex VAT); Adaptec PowerDomain 2906 is £49 (ex VAT) from Adaptec UK 01276 854500

Entrega USB-Parallel Adaptor: USB upgrade card; 2-port is £29.99 (ex VAT) or 4-port is £49.99 (ex VAT) from Entrega Europe 0118-965-7751

iMation SuperDisk is £120 (ex VAT) from iMation UK 01344 402006

Infowave PowerPrint is £75 (ex VAT) from SoftLine 01372 726333

Keyspan USB-Serial adaptor is £69 (ex VAT); Keyspan 2-port USB Upgrade card is £59 (ex VAT) from AM Micro 01392 426473



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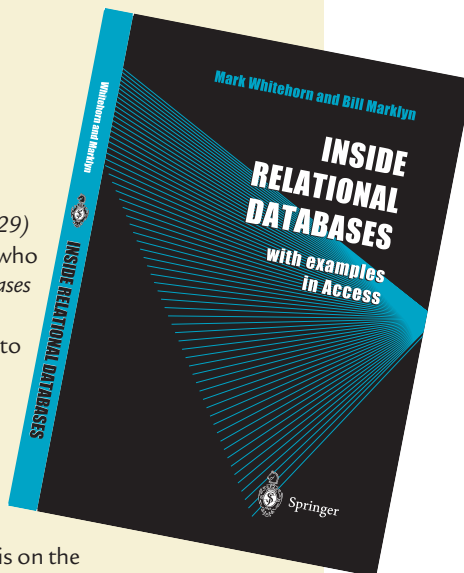
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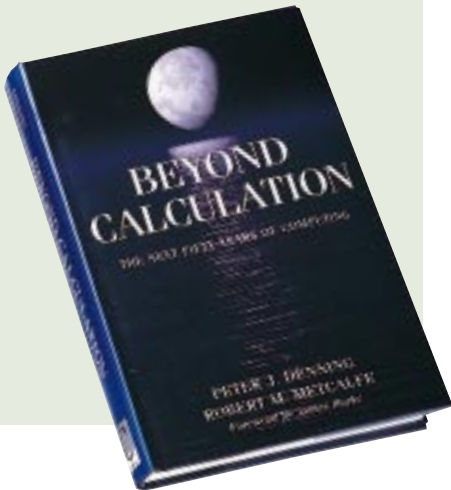
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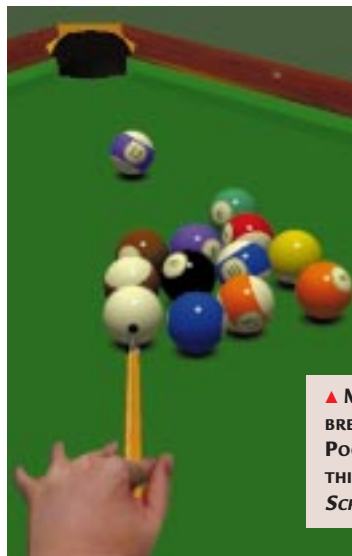
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leisure lines

Another month, another batch of brilliant game reviews. The delights we have for you in *Screenplay* this issue include **RESIDENT EVIL 2**, Biosys, Alpha Centauri, the new **SOUTH PARK** game, Pool:shark and Live Wire. There's variety in the *CD-ROMs* section, too. If you have green fingers or would like to increase your floral knowledge, the review of **ENCYCLOPAEDIA BOTANICA** will

interest you, and Let's Get Cooking will be a great help in the kitchen. Other CD reviews include the follow-up



▲ MAKE A CLEAN BREAK WITH **POOL:SHARK** IN THIS MONTH'S *SCREENPLAY*



▲ ABOVE FISHY BUSINESS IN LET'S GET COOKING
 ▲ INSET CHILDREN WILL ENJOY THE LEARNING LADDER

LOOP, the definitive story of Apple, and in this month's *Competition* there are seven **MITSUBISHI MONITORS** up for

grabs. You could win a copy of the new Chambers dictionary if you complete our *Prize Crossword*, or if you're ready to tackle some *Brainteasers*, a book token could be on its way to you soon. And finally, in our nostalgic *Retro* column, Simon Collin explains why the **AMSTRAD PPC640D** is not the ideal travelling companion.

ETELKA CLARK, LEISURE LINES EDITOR
ETELKA_CLARK@VNU.CO.UK

to **DANCE EJAY**, and Flavours of Sound, software that celebrates 50 years of the modern Commonwealth. You also have a chance of winning copies of both of these CD-ROMs. In the *Kids* section we review a maths, reading and writing product called **LEARNING LADDER**, and speculate on the idea of flight simulation for children with Kid Pilot. In *Books* we explore **INFINITE**

▼ YES, KENNY GETS KILLED AGAIN, IN THE NEW SOUTH PARK GAME



Resident Evil 2

Grisly goings-on in this **zombie-zapper**.

Resident Evil 2, a third-person action game with puzzles, has just been released onto the PC after six successful months as a PlayStation title.

Taking gory action to a new extreme, you, rookie cop Leon S Kennedy, are new to Raccoon City, a nondescript mid-west town. The locals have all come down with a bad case of the Zombie 'lurgy', causing them to lurch to and fro and groan in a frightful fashion. Together with the only other sane person in the locality (who you can also play), it's time to sort out the mess.

Gameplay is viewed from various fixed camera angles, which change randomly but to good effect. You must blast your way from zombie to zombie, solving puzzles by interacting with people, and by using objects. It's all great fun, moving through locations armed with shotguns and flame-throwers.



Shooting the zombies is a messy affair, as they need more than one shot to sort them out good and proper.

This game is a little tricky to control and play isn't blisteringly fast. Compared to some of the more recent blockbusters, it hasn't aged all that well. But if you're into mutilation and flagellation, it will keep any bloodthirsty insomniac awake for hours.

JIM HARYOTT



PCW DETAILS

★★★★★

Price £30

Contact Virgin Interactive
0171 368 2294 www.vie.co.uk

System Specification Windows 95/98, Pentium 166MHz processor, 24Mb of memory, 100Mb free hard-disk space, 4X CD-ROM drive, DirectX-compatible sound and graphics cards (3D card recommended.)

Live Wire

Weird and wacky fun in this very **crazy game**.

This is one of the strangest games to land on the PCW games desk in quite a while. You're a bug-eyed fish-cum-dinosaur creature that hovers just above the ground, dribbling a trail of paint everywhere you go.

Your mission is to zoom around a grid of squares, colouring them in before your opponents colour in too many of their own. All the time you are pestered by sharks that live under the game board, and all manner of crazies who are out to get you. Oh, and there's a thumping 'house music' soundtrack for your aural entertainment as well.

Hope this is clear. If not, I can put it another way. Live Wire is a dolled-up version of the classic seventies arcade



game, Painter, in which you had to colour in as many squares as possible by tracing their edges with a roller. The gameplay is incredibly simple and this is why it's so very addictive.

There's more to it than just coloured squares, though: bad guys try to nobble you, and there are all sorts of bonuses to pick up. Each of the levels is a barrel of laughs: I particularly enjoyed skipping round the planet that is spinning through space. Live Wire is easy to pick up and a

riot to play. What's more, it's a steal at only twenty quid.

J MARK LYTLE

PCW DETAILS

★★★★★

Price £19.99

Contact SCI; 0171 585 3308 www.sci.co.uk

System Specification Windows 95/98, Pentium 133, 16Mb RAM, Windows-compatible sound and video cards, 20Mb hard-disk space, 4X CD-ROM drive, DirectX 5 or higher (supplied on the CD).

Alpha Centauri

The follow-up to the cracking *Civilisation* gives you control over some complex creation.

Civilisation is one of the all-time classic PC games, and Sid Meier's follow-up, *Alpha Centauri*, is an attempt to update an old favourite. A complex mix of population control and strategic planning, it places you as the leader of one of seven factions that has escaped from an apocalyptic Earth to crash-land on Planet, in *Alpha Centauri*.

Gameplay follows *Civilisation's* rules but updates the interface and adds more complexity. More keyboard shortcuts, increased automation and production queuing ease the repetition. The introduction of terrain elevation and



weather patterns means that base location is now a finer decision. It's difficult, however, and unless you're prepared to put in some long and patient hours, it can be frustrating. It's easy to play at novice level, stack the odds in your favour and use the auto-save for a quick fix of dictatorship, but those precious advances will only come with time.

The game's AI isn't perfect; after a while, automated units can stop doing anything useful. The people who will really get into this game will want to have control over every

little detail — that's the whole point, really.

BARRY DE LA ROSA

PCW DETAILS



Price £34.99

Contact Electronic Arts/Firaxis Games
01753 546465 www.ea.com

System Specification Windows 95/98, Pentium 166MHz, 50Mb free hard-disk space, 32Mb RAM, 4X CD-ROM, DirectX-supported sound and video card.

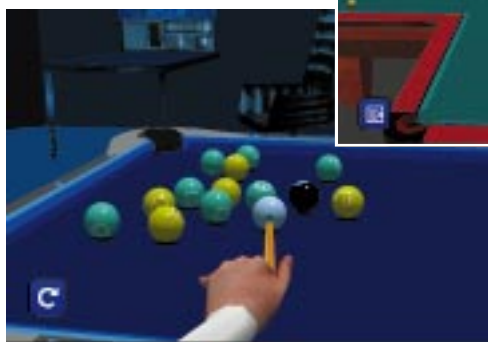
Pool:shark

Right on cue, a new, true baize-blazer.

Any true fan of Pool will tend to be wary of any claims made by the producers of software simulations. The idiosyncrasies or flawed elements of the real-life game couldn't possibly be conveyed; or could they...

Pool:shark has 14 of the most popular rule sets to choose from, including 3 Ball, Killer, 10 Pin Bowl Pool, 8Ball US & UK, and of course Straight Pool. You can also select from various table sizes and shapes, including a diamond. Further, you can play hustlers with their own personalised styles and even enter tournaments with your friends over a network.

It certainly seems to be definitive on paper, and when it comes to actually playing, a marvellous feeling pours over you as you realise the game designers knew all that was missing in any



previous efforts. Full 3D physics systems allow balls to drop into pockets when the table is bumped, and they can be chipped off tables as well as generally making all the right moves. An intelligent camera always gives you the best view of the game, and an animated bridging hand allows for a fuller awareness of your positional requirements.

There's a real level of skill required to master these features and they're

not totally alien to the real-world environment they're attempting to simulate. Best of all is using the mouse to offer true

cueing action. With the implemented force translated by the speed, you are able to ram the mouse towards your imaginary cue ball and despatch it with a great flourish.

IAN ROBSON

PCW DETAILS



Price £39.99

Contact Gremlin Interactive
0114 263 9900 www.gremlin.com

System Specification Windows 9x, Pentium 133MHz or equivalent (P200 recommended), 16Mb RAM (32Mb recommended), 4X CD-ROM, 10-90Mb free hard-disk space (depending on size of install).

South Park: Deeply Impacted

The game that's bigger than Cartman's fat a** has some **turkey tendencies**.

A mysterious comet that approaches once every 666 years is headed towards town, to cause untold mayhem. But fear not: Kyle, Cartman, Stan and Kenny are here to save the day. Armed with a host of



gadgets ranging from cow launchers to fart dolls, you'll have the opportunity to prove you're not a wuss against Mr. Garrison, Big Gay Al, Santa, Satan, Terrance & Philip and many more. You can choose the one-player story mode and

endure five episodes based on the television originals, playing as one of the four stars. The first episode, 'Operation: Turkey Butt', starts off quite calmly, with you rounding up your friends. Then real fear casts its ugly shadow, as you're attacked by berserking turkeys.

There's no real playability, just the fact that you can become part of this beautifully recreated world in all its harmonious glory.

Oh, and Kenny dies.

IAN ROBSON

PCW DETAILS

★★★★

Price £34.99

Contact Acclaim 0171 344 5000

www.acclaim.net

System Specification Windows 9x, Pentium 200MHz or equivalent with 3Dfx card, or P266, 32Mb RAM, 4X CD-ROM, 95Mb free hard-disk space.

Biosys

An ecological **voyage of discovery** inside a computer-controlled biosphere.

Biosys is not your typical game — no guns, no fast cars, no beating up of opponents: it's a different kettle of fish altogether. As the first ecologically aware game we've come across, it's both gripping and thought provoking.

You take on the persona of Allan Russell, a scientist trapped inside his



own artificial biosphere. Your task is to discover and piece together the fragments of a conspiracy against you and your vision of the future.

So far, so what? Well, the extra-special ingredient comes in the form of a computer system that controls the biosphere. It's up to you to work out how to use it and get to grips with managing all aspects of the internal environment. Add a dash of amnesia and a murder or two, and you have a recipe for a thoroughly enthralling voyage of discovery.

Your immediate surroundings are presented in rich 3D graphics, through



which you are free to roam as you explore the dome. In fact, it's entirely possible to ignore the overall object of Biosys and just become fascinated by the mechanics of the man-made world. Authentic sound effects add to the general spooky atmosphere of the deserted biosphere.

Biosys is a groundbreaking eco-simulation wrapped in a puzzle and presented with a generous helping of mysterious intertwined plotlines.

J MARK LYTLE

PCW DETAILS

★★★★★

Price £35

Contact Take2; 01753 854444

www.take2games.com

System Specification Windows 95/98, Pentium 100 (200 recommended), 16Mb RAM (32Mb recommended), Windows-compatible sound and video cards, 123Mb free hard-disk space (375Mb recommended).

Dance eJay 2

Song sung blue, or any way you like, as you sample up a storm in this **musical mega-medley**.

If you missed **Dance eJay** the first time around, the idea is that those nice eJay people supply you with over 1,300 musical snippets and sung samples, all of which are royalty free and recorded at 140bpm. These can be dragged and dropped onto one of the 16 tracks that form the upper section of the screen in whichever order you want to create an almost infinite number of songs. You can change the volume of individual samples by clicking on them and raising or lowering the individual level bar, or shorten it to crop the closing notes by dragging the right-hand border to the left.

That's all there is to it. For the more adventurous, there's the option of customising your tracks still further. The Groove Generator, which allows you to add a real-time drum track to your

composition, can really carry your tune along, while the Effects Studio can be used to distort the bundled samples beyond recognition. The handbook is concise but comprehensive, covering everything the first-time user needs to know in an easy-to-follow way. This is an impressive, powerful and simple package, but more important than all of that, it's fun!

NIK RAWLINSON

➔ We are giving away 5 copies of *Dance eJay 2*. Send your name and address on a postcard to: Neena Patel, FastTrak, 26 Greenhill Crescent, Watford Business Park, Watford, Herts WD1 8XG.



PCW DETAILS

★★★★★

Price £29.99

Contact FastTrak 01923 495496

www.fasttrak.co.uk

System Specification Pentium 66 or higher, Windows 95/98/NT 4.0, 16Mb RAM, 40Mb free hard-disk space, 4X CD-ROM, 16-bit sound card, 256-colour display.



Encyclopaedia Botanica Plus

This gardener's reference and storage database is **blooming lovely**.

Spring is finally here, and if you haven't done so already, it's time to get your gardening mitts on. The extensive database in the *Encyclopedia Botanica* CD stores over 10,000 plants, and can be expanded with photographs and information on the user's own plants. The existing global plant reference includes information on maintenance, planning and growing your garden.

You can conduct powerful searches using three search functions, all of which allow you to list the plants in the database alphabetically, either by botanical name, family name or common name. And you can refine your search by looking for certain attributes, for example the flowering season, colour of the plants' flowers, and the type of growing soil.

The Journal feature allows you to record your own gardening, planting and weather notes, which is particularly



helpful for monitoring your garden's progress. And the Create Garden Lists feature makes management easier, as you can compile lists of plants, and keep tabs on what you planted and where you planted it. You can print out your lists and labels too, so if you don't know the

difference between a Venus Fly Trap and a Snapdragon, there's no need for concern.

This is a nicely presented CD-ROM, a comprehensive plant reference guide and a garden planner that is ideal for gardeners of all levels, interests and specialities.

HELEN FORTGANG

PCW DETAILS

★★★★★

Price £29.99

Contact FastTrak 01923 495496

www.fasttrak.co.uk

System Specification Windows 95/NT, 486 processor, 8Mb of RAM, 16-bit colour, 32Mb free hard-disk space, 6X CD-ROM, QuickTime for Windows 2.1 (included).

Flavours of Sound

A vibrant, attractive way to get to know **world music**.

Rather like the House of Lords, everyone knows what the Commonwealth is, but not so many of us are quite sure who's in it or what it does. This multimedia CD, celebrating 50 years of the modern Commonwealth, is designed to redress that balance.

Following a live introduction from the Commonwealth Secretary General, you're pitched into an attractive menu-driven environment. The vibrant colours and unusual sounds will be particularly appealing to children, making the product an ideal supplement to learning in the classroom, especially as project ideas for parents and teachers are also included. Kids will love the way that, via sub-menus and icons, they can delve deeper into those subjects that interest them. Indeed, the



information supplied on the geography and culture of the countries themselves, and the way it is presented, is the equal of any multimedia encyclopaedia.

As the theme of this year's Commonwealth Day was music, you're treated to video footage of celebrations around the world and six audio tracks

from a variety of world musicians, allowing you to sample the delights of stars from the African, Latin and Caribbean music worlds. There's a slight lack of interactive content, but it would be churlish to complain when the rest of the program is so lively, informative and, best of all, free.

OWEN GIBSON

✦ We have 50 copies of this CD-ROM to give away. Send your name and address on a postcard, for the attention of:

Melody - Coleman Getty
PCW Flavours of Sound Competition
Carrington House
126-130 Regent Street
London W1R 5TE

PCW DETAILS



Price Free

Contact Commonwealth Society
0171 930 6733

System Specification Windows 95,
Pentium 100MHz, 8Mb RAM,
4X CD-ROM drive, sound card.

Let's Get Cooking

For culinary clues, this is **the plaice** to start.

It's a sad fact of life that cooking can become a chore, especially if you run out of inspiration. This CD-ROM offers tips, recipes, techniques and even a pantry. There are video sequences of American star chefs, sharing their own expert techniques and advice, and answers to common questions.

Instruction is clear, from video help with the software, to 80 illustrated techniques. These are only drawings, however, and would be far more beneficial if they too were video sequences. The recipe section allows you to save your favourite choices, print



the program, while you can go back to any of the screens you have previously visited in that session. As well as web links to hundreds of cooking sites, a particularly

useful part is the conversion of measuring methods. You can set up the program so that it displays the methods you prefer, for example American or English. Although this isn't the best cooking program I've seen, Let's Get Cooking does give some ideas to anyone seeking culinary inspiration.

them out, and look at variations that use the same core ingredients. Nutritional information is displayed, and you can modify the recipe and give it your own title. The comprehensive recipe search is based on the 1,500-strong database which includes a photo-illustrated glossary of cooking terms and ingredients. Each screen display links to other parts of

the program, while you can go back to any of the screens you have previously visited in that session. As well as web links to hundreds of cooking sites, a particularly

useful part is the conversion of measuring methods. You can set up the program so that it displays the methods you prefer, for example American or English. Although this isn't the best cooking program I've seen, Let's Get Cooking does give some ideas to anyone seeking culinary inspiration.

HELEN FORTGANG

PCW DETAILS



Price £26.99

Contact Prentice Hall Europe 01442 881900 www.macmillansoftware.com

System Specification Windows 95/98, 16Mb RAM, VGA card (256 colours, 640 x 480 resolution), CD-ROM drive, 15Mb free hard-disk space.

Learning Ladder - Years 1&2

The wonder of **words, numbers and pictures**, with Woody the pencil.

This series has been designed to complement the National Curriculum. It supports children aged from five to seven and teaches English, Maths and general knowledge. After the child has chosen his/her representative picture, Woody the skateboarding pencil takes them to the playroom. Here, the child will find scores of activities they must click on to view.

Throughout the program, Woody provides clear instruction, encouragement and help for when they get stuck. Activities include painting pictures, recognising sounds, letters and shapes, and time telling, grounding the basic skills of literacy, numeracy and knowing the world around us. The



presentation is lively and colourful, and Woody is a charming character who kids will love.

There are plenty of fun activities to keep the child occupied for many hours and which are versatile enough for them to return to without getting bored.

The child receives further incentives to learn more, through being awarded stickers at the completion of each exercise. These coded stickers must be

correctly placed within alphabetically ordered pictures to create many different scenes. There is also a report card to show the child's progress, including how many stickers they have achieved.

This production successfully communicates the essential skills to children of this age-group level. It does so in a colourful and captivating style, allowing kids to climb that ladder in a more enjoyable way.

HELEN FORTGANG

PCW DETAILS



Price £19.99

Contact Dorling Kindersley
0171 836 5411 www.dk.com

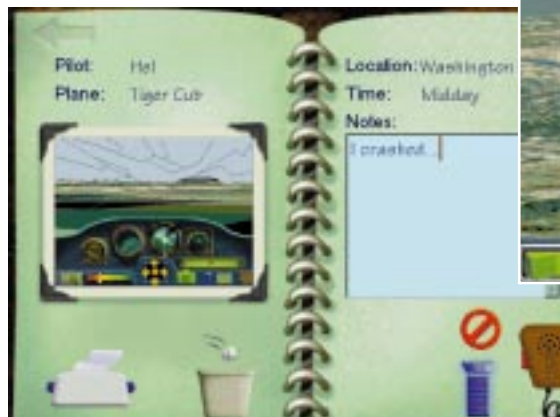
System Specification Windows 95/98, 486DX2/66MHz, 12/16Mb, 640 x 480 pixels, 256 colours, 2X CD-ROM, 6Mb free hard-disk space, 8-bit sound card, speakers/headphones, mouse.

Kid Pilot

Not so much flying high, as a **crashing bore**.

A flight simulator for kids — what a great idea! Sadly, this is a poor production. Although there are nice features to be found within the CD-ROM, it is sparsely designed, with bad graphics. Once you have set yourself up as the pilot, you have three planes from which to choose, and three levels of difficulty with which to fly them. You can choose

the time of day, between dusk, dawn or midday, and pick designated areas (in America) to set the scene. It does use child-friendly controls, at least when setting up for flight. But when it actually comes to flying the plane, the child is expected to know where the throttle lever is with no prior demonstration. Also, after the initial area scene, all that is visible are coloured squares and impressions. This makes flights very



boring, and you can't see where you're supposed to land. Penwick the Penguin is your aviator guide, explaining what the buttons do and giving snippets of information on each location in which you fly. However, he's the most dull and repetitive host I've met for a long time.

Kid Pilot has the potential to be very good, though the effort that has gone into its authenticity appears minimal — perhaps because it's aimed at children.



This production doesn't deliver what it leads you to expect, and is generally disappointing.

HELEN FORTGANG

PCW DETAILS



Price £14.99

Contact Knowledge Adventure
01189 920 9100

www.knowledgeAdventure.com

System Specification Windows 98/95, Pentium 90, 2X CD-ROM, 16Mb RAM, 30Mb free hard-disk space, sound card, 256-colour display 640x480, mouse.

Odd job

A triumph of peculiar design, the **Amstrad PPC640D** was just too weird to work.

Another month, another dead laptop. Maybe it's the way I type that seems to knock out laptops just before I'm about to travel. Trouble is, my collection of usable machines is dwindling, and in desperation I even thought of using an old Amstrad PPC640D. Hatched in early 1988, this miracle of peculiar design was Amstrad's first laptop and, unfortunately, did not duplicate the great commercial success of the company's desktop range.

The Amstrad was, it's safe to say, one of the oddest-looking portage computers in the files. It had plenty of the elements of the latest laptop designs, but arranged in a rather unusual way. The main difference was Amstrad's desire to include a full-size keyboard. While other companies at the time scaled down the size of each key, removed numeric keypads and so on, Amstrad kept a full-width keyboard with numeric pad and cursor control keys just like on a desktop.

By using a standard desktop-sized keyboard, the rest of the casing had to be as wide, but this hardly helped portability. The designers took a sideways view and flipped the traditional layout on its side: the machine was wide and narrow with a handle on the short side. Flip open the dark grey casing and you reveal the full-width keyboard and a supertwist LCD panel tucked flat into one corner. The screen popped up at an angle for viewing, but won little praise for its readability.

The blue-on-green text (yes, really) in those pre-backlight days was hard work.

Although unconventional, I rather liked this method of separating out the display from the keyboard and casing. I'm pleased to see that, after 10 years, there's a similar but updated design in the shops at the moment. The current manufacturer uses this trick to reduce overall size and still allows business travellers to sit the panel on an overhead projector. The difference is that this has a 300MHz processor and 4Gb hard disk, yet is no bigger than a hardback novel.

Enough of the display: like all



▲ **AMSTRAD'S FIRST LAPTOP DAZZLED WITH ITS BLUE TEXT ON A GREEN SCREEN, AND ITS FULL-SIZE KEYBOARD DID LITTLE TO AID PORTABILITY**

displays at the time, it was barely readable except with carefully placed side lighting. The real benefit of the fold-down display panel was that you could tuck it down and use a normal monitor instead. For input, the keyboard, naturally, had good action and was easy to use but rather clackity.

By current standards of 400MHz Pentium IIIs, this portable was no power

... plenty of the elements of the latest laptop designs, but arranged in an unusual way

beast. However, for the period, the 8MHz 8086 Intel processor provided ample power. The entry-level PPC512 had 512Kb of RAM, but the flagship PPC640 that we're covering here included 640Kb as standard — just fine for all DOS applications.

A wonderfully silly idea was the battery power pack. Other laptops of the period from leader Toshiba had rechargeable batteries for work on a plane or wherever. The Amstrad used standard, non-rechargeable, large C-size batteries. Actually, it used 10 of them. I remember sitting outside a pub in

Richmond with a friend who was showing off his PPC640D: his briefcase had a spare set of 10 C-cells that had to be slotted in after just a couple of hours' use. To help eat up the battery power, the PPC640D included an integrated 2400bps modem, together with a copy of the CrossTalk Mirror software as part of the bundle of integrated software applications. Perhaps more limiting was the lack of hard disk. Buyers had a choice of one or two 720Kb 3.5in floppy drives. A year later, the Stratum company launched a plug-in hard-disk expansion system, optimistically called the Sprint, for those users still interested in expanding their beloved PPC.

I didn't use the PPC this time around: there's no way it would fit on an airplane tray and I can't afford to keep it in batteries at around five per hour. There were several neat features that have been re-used more successfully in newer laptop designs, but sadly, this unusual machine didn't last too long in the shops.

SIMON COLLIN

Win a Mitsubishi DiamondScan monitor!



▲ THE MITSUBISHI DIAMOND-SCAN70 WORKS WELL WITH ANY PC

Spring is in the air, and here at PCW we're going monitor mad! Mitsubishi is giving away seven monitors from its DiamondScan range — three Scan90s worth £385 each, and four Scan70s worth £195 each.

➔ **The DiamondScan90**, a 19in display, and the **DiamondScan70**, a 17in display, are easy-to-use, high-performance monitors, ideal for general business, desktop publishing and internet applications.

The DiamondScan90 offers an ultra-fine 0.25mm dot pitch and a 30-95kHz horizontal scanning range, to precisely display a maximum non-interlaced resolution of 1600 x 1200 at 75Hz or 1280 x 1024 at 85Hz.

The DiamondScan70 has a 0.28mm dot pitch combined with a flat shadow-mask tube which eliminates blur to produce clear, sharply defined images. Its true multi-scanning ability allows automatic tracking of horizontal frequencies from 30-70kHz for high-resolution, flickerless image reproduction with almost any personal computer.

➔ **Mitsubishi's extensive colour monitor line** features a full range of sizes from 14 to 40 inches. The Display Products Division markets three ranges of monitors, including:

- the value DiamondScan desktop range;
- the high-performance DiamondPro desktop monitor range; and
- large-screen plasma and CRT-based presentation monitors.

All products are sold through a network of authorised distributors, resellers and dealers across the UK.

The DiamondScan series is a cost-effective solution for all desktop applications.

➔ **To enter this competition**, answer the following question: The DiamondScan90 offers an ultra-fine dot pitch of...

- A) 25 M
- B) 0.25mm
- C) 25cm

• For details of how to enter this competition, see the panel below.



▲ THE MITSUBISHI DIAMOND-SCAN90 IS IDEAL FOR BUSINESS AND DTP



How to enter the competition

1. Via the *Personal Computer World* web site at www.pcw.co.uk, or
2. Write your name, address and daytime telephone number on a postcard or on the back of a sealed envelope (please don't send letters). Mark your card 'PCW/Mitsubishi Competition' and send it to the following address:

Personal Computer World
Building 960
Sittingbourne Research Centre
Sittingbourne
Kent ME9 8AG
to arrive by 28th May 1999.
• Please state clearly on your competition entry if you do not wish to receive promotional material from other companies.

Rules of entry

This competition is open to readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications and Mitsubishi. The Editor of *Personal Computer World* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.

books

MCSE Windows NT Server 4

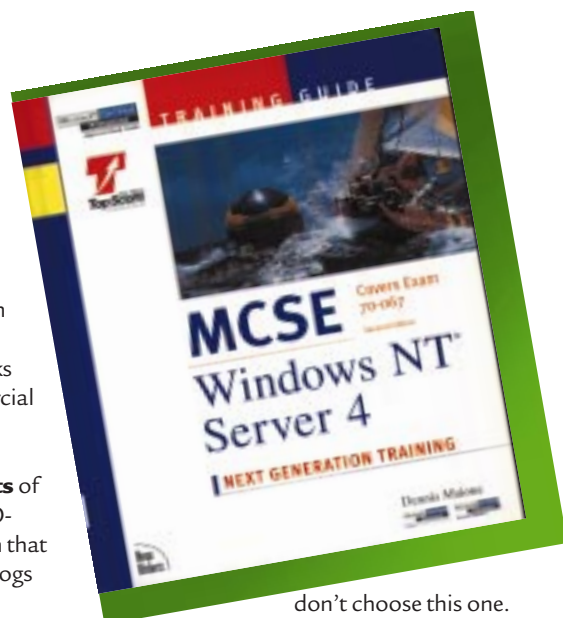
If you're thinking of becoming a Microsoft Certified Systems Engineer (MCSE), this book is aimed at helping you pass the exam. Although to the uninitiated it may seem a complex beast, anyone with a moderate amount of NT experience, even if it's only with Workstation, should find the technical content fairly easy going. But as with any exam, the devil is in the details, and it's with drilling the facts and figures into the grey matter that this book will be most helpful.

Being concerned with NT Server, it's no surprise that the book concentrates on the processes of network setup and configuration. There are nine chapters dealing with planning, installation and configuration, managing resources, connectivity,

monitoring, optimisation, and troubleshooting. The end of each chapter includes sample exam questions, and there are useful case studies going through the process of choosing and configuring appropriate networks for various hypothetical commercial situations.

One of the most useful aspects of the book is the accompanying CD-ROM, which as well as a program that simulates NT's configuration dialogs and options, contains an exam application similar to the real thing, complete with 201 questions and 90-minute time limit. Confidence isn't inspired by the number of typos in the questions ('True or Flase' is a common one) but it's invaluable for getting the feel of the real exam, and it doesn't let you cheat during the test, either.

If you're looking for a general book on how NT Server works and what it can do,



don't choose this one. It's too narrow in its scope to be an everyday NT companion. If you're looking to learn how to configure the Remoteboot Service, for instance, you're out of luck. The general style is also necessarily dry, and concerned for the most part with imparting the relevant facts and figures. But if you're serious about passing the MCSE exam, this is an essential purchase.

DAVID FEARON

PCW DETAILS



WINDOWS NT SERVER 4

Author Dennis Malone

Publisher New Riders

ISBN 1-56205-916-5

Price £46.95

Infinite Loop

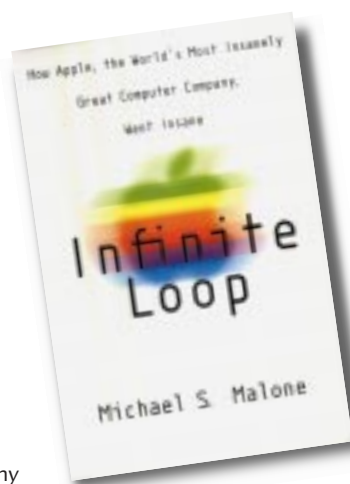
What is striking about this new corporate biography of one of the great American success stories, is the detail that is packed into each page. Malone has spent a vast amount of his writing career covering the ever-evolving story of Apple, and presents here his conclusions on this rollercoaster ride.

Myths are exposed in each chapter. The Steve Jobs Reality Distortion Field is described as more of a personality disorder than a mythic element that allowed Jobs to found Apple along with his partner, Steve Wozniak. John Scully's

term in office as Apple's CEO is shown to be little more than an incompetent attempt by a genius marketing man to step up into the

realms of management. Gil Amelio's attempt to make Apple grow up, and, of course, the tentative links to Microsoft and Bill Gates' protection of the Wintel alliance, all come under the spotlight.

Apple is a company like no other in corporate America. From day one it ran against the trend, offering a technology that was a purchasing decision as well as a heartfelt yearning to be part of something great. Apple managed to utilise this yearning at every stage. But the gloss hid a company that was, for the most part, out of control. This book highlights the fundamental mistakes that were made



early on in Apple's history, and those that would later return to haunt it at every turn. Regis McKenna, a Silicon Valley marketing guru, pronounced, 'The mistake everyone makes is assuming that Apple is a real company. But it's not. It never has been.'

Apple may not be a real company, but its history is a fascinating read nonetheless. Malone has done an excellent job of

assembling the facts that are Apple Computer without hyperbole and has delivered a story that is rich, informative and, above all, legitimate. With its coverage of the heady days of massive growth, to Apple's free-fall into near oblivion and its possible resurrection with Steve Jobs back at the wheel and the launch of the iMac, this is the definitive story of Apple.

DAVID HOWELL

PCW DETAILS



INFINITE LOOP

Author Michael S. Malone

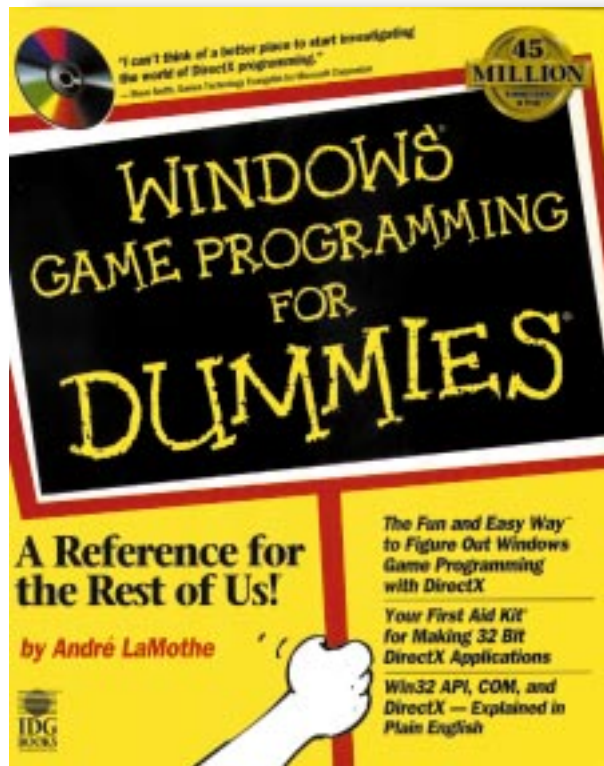
Publisher Doubleday

ISBN 0-385-48684-7

Price £16.63

Windows Game Programming for Dummies

A prerequisite for any reader of this book is a thorough understanding of C, and at least a passing understanding of C++. LaMothe explains clearly how fast 2D-game development is possible with DirectX; that it allows the seamless access of hardware-specific features, which therefore allows the game designer to concentrate on, well, designing their game. You won't be programming Quake by the end of this book, but you will be able to competently program 2D games for Windows 95.



Split neatly into five sections, you begin by familiarising yourself with the DirectX environment, and getting your computer ready for Windows games development. This means installing the DirectX Software Developer's Kit, and setting up your C compiler.

Part Two is more detailed, as it explains how DirectX works and its relationship with the Windows 95 API. The remaining chapters focus on specific areas of games design, such as graphics and sound, each of which have a DirectX component, such as DirectSound for audio and DirectInput for joysticks and mice.

LaMothe's style is engaging, and follows the now familiar Dummies format but without talking down to its readers. The author has gone to great lengths to make his book as complete as possible, including two

extra chapters on the accompanying CD-ROM that cover artificial intelligence and game algorithms.

He does, however, assume quite a high level of programming knowledge in C, which could be a problem for some readers hoping to learn game programming via DirectX without the necessary foundation skills with that language.

This book is not a comprehensive manual for Windows game programming, but it is a concise taster of what is possible with the DirectX programming environment. Nuggets of code are supplied in each chapter which teach by practical example. If 2D sprite-

based games are the limits of your current ambitions, then here is all the information you will need to create Windows games. However, if you harbour more ambitious designs, then this book is still a useful primer for a more detailed study of DirectX.

DAVID HOWELL

PCW DETAILS



WINDOWS GAME PROGRAMMING FOR DUMMIES

Author André LaMothe

Publisher IDG Books

ISBN 0-7645-0337-5

Price £28.99

TOP

10

books

- 1

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 £15.95

Prices include VAT on disks and CD-ROMs. List supplied by The PC Bookshop, 21 Sicilian Avenue, London WC1A 2QH. Telephone: 0171 831 0022 Fax: 0171 831 0443

brainteasers

Quickie

Of 300 people interviewed at a disco, two-thirds said they drank, a half said they smoked, 60 said they did neither. How many both drank and smoked?

This Month's Prize Puzzle

What is the largest number, less than one million, that has exactly 50 factors (including unity and the number itself)?

Answers on a postcard or the back of a sealed envelope, to: PCW Prize Puzzle - June 1999, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20th June 1999.

We will also accept solutions by email. Send the solution and your name and address only (no explanatory notes or program listings, etc) to:

jj.clessa@btinternet.com.

Winner of March 1999 Prize Puzzle

The first email solution we received for this problem pointed out that we had

mixed the units — metres and feet.

So, to simplify things, we accepted either solution. 148 entries were received in all, 94 by email. The required answers were:

➤ To the problem as set, 52.75 hours approximately.

➤ To the problem with equal units, 57.5 hours.

The winning entry, drawn at random, came from Mr Peter Eldred, of Wokingham. Congratulations, Peter, your prize is on its way. To the also-rans, keep trying, it could be your turn next.

● Some readers asked how this type of problem can be solved. Some used Lagrange, some Newton-Raphson, others dynamic programming, and many other complex-sounding approaches.

I used a simulation approach, as follows:

1. 'Unroll' the half cylinder to give a rectangle of width 5 metres and depth 12 feet. This represents the surface that the snail crawled across.

2. Calculate the length of the diagonal from top right to bottom left of this rectangle by Pythagoras. This gives the shortest possible route and thence the basic speed of the snail.

3. Split the rectangle into 4 smaller rectangles using horizontal lines representing the depths of the different oils — 10%, 25%, 5%, and the rest, and also calculate the snail's speeds for each of these sections from the data given.

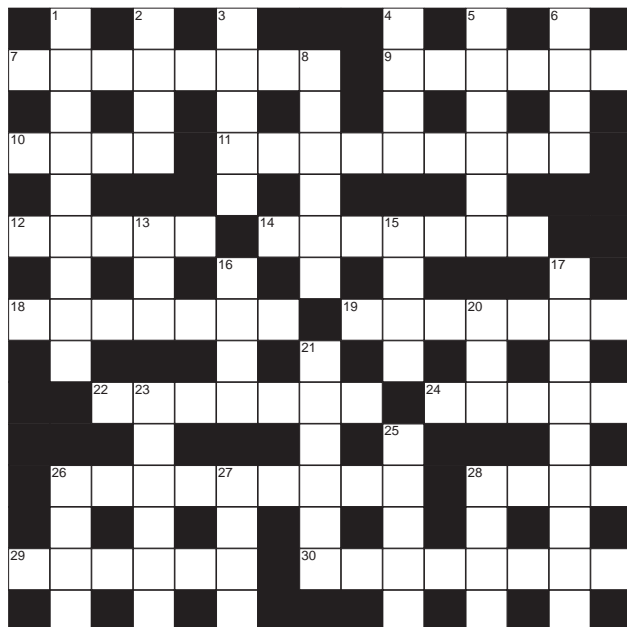
4. Using four nested FOR loops (one for each section) with steps equal to one-hundredth of the width, calculate all possible paths from top right to bottom left via every combination of steps, to find the one with the shortest time.

5. When an approximate solution is found, it can be refined by reducing the interval sizes around this minimum path — i.e. effectively zooming in on it.

● *Don't forget to include your address on your email entries. I can't send a prize via email!*

JJ CLESSA

prize crossword



ACROSS

- 7 Moved to another document or application (8)
 9 Processor's end result (6)
 10 Magnetic storage (4)
 11 Scrambled for security reasons (9)
 12 Standard character encoding scheme (5)
 14 Seafaring software villains? (7)

- 18 Parcels of personal details (7)
 19 Ancient programming language (7)
 22 Amount of data or activity taking place (7)
 24 Surfer's phone-line device (5)
 26 Module for audio capability (5, 4)
 28 Click, hold and move (4)

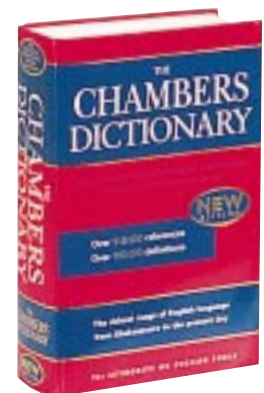
Each month, one lucky PCW Crossword entrant wins a copy of the new *Chambers Dictionary*. This time, it could be you. Send your completed crossword to 'PCW June Prize Crossword', VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive not later than 28th May, 1999.

• Please state clearly on your entry if you do not wish to receive promotional material from other companies.

- 29 Entry into a system, authorised or otherwise (6)
 30 The M of IBM (8)

DOWN

- 1 Enlargement (9)
 2 Domicile (4)
 3 Aquatic mammal (5)
 4 Bloody (4)
 5 Sculpted figure (6)
 6 Taken to court (4)
 8 Double-dealing (6)



Solutions to May's crossword

ACROSS

- 7 Multimedia 8 Dump 9 Diskette
 10 Screen 11 Tester 13 Integer 15 Prompts
 17 Central 19 Optical 21 Aerial 24 Savers
 26 Resident 28 Bugs 29 Fuzzy logic
 DOWN
 1 Quainter 2 Stakes 3 Omit 4 Adder
 5 Bass 6 Impede 8 Darkest 12 Extra
 14 Niece 16 Maidens 18 Atlantic 20 Plague
 22 Indoor 23 Crazy 25 Sift 27 Says

- 13 Printing fluid (3)
 15 Minute particle (4)
 16 Piece of foliage (4)
 17 Heart device (9)
 20 As well (3)
 21 Remove weapons from (6)
 23 Ways (6)
 25 Official decree (5)
 26 Poorly (4)
 27 Office table (4)
 28 Fall in droplets (4)



Contents

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All the best buys are here

Sometimes you just want to know the names of the best products, when they were reviewed, how much they cost and where you can get them. That's where our no-nonsense buyer's guide comes in. Over the following five pages we've picked out the outstanding PCs, peripherals and software packages that we can recommend without hesitation. To make it even easier, we've included the current manufacturer's contact number and price (including VAT), as well as details of when and where we reviewed the product. For the full review, why not check out PCW on CD-ROM? Updated quarterly, PCW on CD-ROM contains the full editorial from the past 24 issues, in searchable Adobe Acrobat format — it even comes with a copy of Acrobat for viewing, searching and printing. Each CD costs just £9.95 including postage and packing, or £8.96 for subscribers. **Call 01795 414870** to order your copy or turn to **PCW Reader Offers (p254)** for further details. If you can't wait for the next quarterly CD, try out our **Faxback service (p520)** which provides 24-hour access to your favourite features and reviews.

GORDON LAING
Editor

Personal Computer World Buyer's Charter



Anthony George, our Customer Services Manager, is here to help you if things go wrong, if you have an enquiry or complaint about a supplier advertising in this magazine, or have encountered problems as a result of goods purchased.

Write to him with details of the complaint, together with your full contact details, and he will endeavour to assist you.

Anthony George
Customer Relations Department
VNU Business Publications
VNU House, 32 - 34 Broadwick Street
London W1A 2HG

MOPS — Buyers Charter

When you order goods as a *private* individual reader from a UK supplier's advertisement in *Personal Computer World* and pay by post in advance of delivery to that Mail Order Advertiser who subsequently ceases to trade and goes into Liquidation or Bankruptcy prior to delivery of such goods, you may, under the 'Buyers Charter', qualify for compensation, providing:

1. You have not received the goods or had your money returned.
2. You have followed the *Personal Computer World* guidelines when placing your order.
3. Have taken all reasonable steps to effect delivery or refund.
4. You have retained irrefutable proof of purchase, for verification purposes:
 - a) A copy of the original advertisement from which the goods were ordered.
 - b) Comprehensive proof of payment.

GUIDELINES

Claims must be submitted so as to arrive 'NOT EARLIER THAN TWENTY EIGHT DAYS AND NOT LATER THAN THREE MONTHS' from the official on-sale date of the magazine. Claims must be submitted to the Customer Services Manager IN WRITING, summarising the situation and lodged strictly within the time schedule stated. *Claims received outside this period will not qualify for consideration for compensation under the 'Buyers Charter'.*

Once a supplier who has advertised in this magazine has become subject to either Liquidation or Bankruptcy proceedings and upon completion of all winding-up procedures, *Personal Computer World* guarantees to expeditiously process those *private* individual readers' claims made and submitted, in accordance with those procedures outlined, up to the following limits.

- a) £2,000 in respect of any claim submitted by one Private Individual Reader.
- b) £100,000 in respect of all advertisers so affected in any one year.

These sums define the Publishers maximum liability under the scheme, and any additional payments above and beyond these thresholds will be entirely at the Publisher's discretion.

As soon as legal confirmation that a state of liquidation or bankruptcy exists, the processing of claims will immediately commence. If, however, assets are available and the receiver/liquidator appointed confirms that an eventual payment will be made by way of a dividend, all claims under the 'Buyers Charter' will be subject to re-processing and will take into account any shortfall which may then exist. Payments under the scheme will also take into consideration the obligations and liabilities of other interested parties such as credit card and/or insurance organisations etc.

EXCEPTIONS

This guarantee only applies to advance postal payments made by *private individuals in direct response for goods itemised/illustrated in display advertisements*. It does not cover goods ordered from advertising Inserts or Cards, classified advertisements or MicroMart, or Catalogues obtained from, or supplied by, any advertiser regardless. *Similarly, protection does not exist in relation to purchases made as a result of reviews and/or editorial comment.* The 'Buyer's Charter' is designed to safeguard the *PRIVATE individual reader*. It does not provide protection to any companies, societies, organisations, unincorporated bodies or any other commercially orientated outlet of any description. Neither is cover provided for orders placed from, or to, any overseas suppliers or for goods purchased for resale.

CAVEAT EMPTOR

Readers are reminded that the Mail Order Protection Scheme was solely implemented to provide protection to the private individual when goods are ordered 'Off the Page' and paid for by post. *It was not designed for, nor will it offer any protection, in the event whereby goods are purchased via the Internet.*

DISCLAIMERS

Readers are reminded that the opinions expressed, and the results published in connection with reviews and/or laboratory test reports carried out on computing systems and/or related items are confined to, and are representative of, only those goods as supplied and *should not be construed as a recommendation to purchase*. Whilst every precaution is taken to ensure that reliability and good business practices prevail, the Publisher cannot be held responsible for the overall trading activities of any supplier referred to, or advertising within, this publication.

DESKTOP PCs

Due to the fast moving nature of the PC industry, we can only recommend particular PCs in the month we have seen them. Prices change almost weekly as component prices from third-party suppliers fluctuate according to availability. So, for this month's best PC buy, for instance, look at the group test on p128. It always pays to take a little care when buying a PC, or in fact any hardware or software. For PCW's guide to buying direct see p569. And don't forget to use the PCW order form. Obviously, everyone's ideal PC will have a different mix of components, with gamers needing a very good 3D graphics card, probably a 3D sound card and excellent speakers, and business users will need a good monitor and plenty of RAM.

ENTRY-LEVEL PCs

Budget-conscious buyers might consider going for a non-Intel processor, such as an AMD. However, be aware that if you choose a Socket 7 chip you might find it hard to upgrade in future. Similarly, if you go for a Slot 1 processor, make sure you specify a motherboard with a BX chipset which will allow for greater upgrading options in the future. We would recommend the following specification:

- AMD K6-2 350 or Intel Celeron 366 processor
- 32Mb RAM
- 4Gb hard drive
- Graphics card with 8Mb video RAM
- 15in monitor
- CD-ROM drive

You can expect to pay between £499 and £599 (ex VAT) for this configuration, with either a sound card and speakers or a modem. However if you have a little extra cash, take a look at the PC group test in our May '99 issue (p134), which features Celeron 400 PCs for £799 (inc VAT).

MID-RANGE PCs

In the mid-range, around £1,000 (ex VAT) will get you a good all-round PC. The introduction of PIII has turned PII into a mid-range processor, both on price and performance. However, the stunning result of the K6-III, and its low price, make it worth serious consideration. We'll take an in-depth look at K6-III in our July '99 issue. Look for a minimum of:

- Intel PII or AMD K6-III 400MHz processor
- 64Mb RAM
- 8Gb hard disk
- Good 3D graphics card with 16Mb video RAM
- 17in monitor
- CD-ROM drive
- Sound card, speakers, 56K modem

Most of all, look for a machine that is easy to upgrade, so specify plenty of slots and no on-board chips on a good motherboard, and lots of free bays in the case.

HIGH-END PCs

If you are after a state-of-the-art machine, be prepared to spend around £1,500 (ex VAT). What you require at this price will be specific to your needs, depending on how you intend to use the machine. However, as a basic specification we would want:

- PIII 500
- 128Mb 100MHz RAM
- 16Gb hard drive
- Good 3D graphics card with 32Mb video RAM
- 19in monitor
- DVD drive
- Sound card, speakers, 56K modem
- Bundled office suite

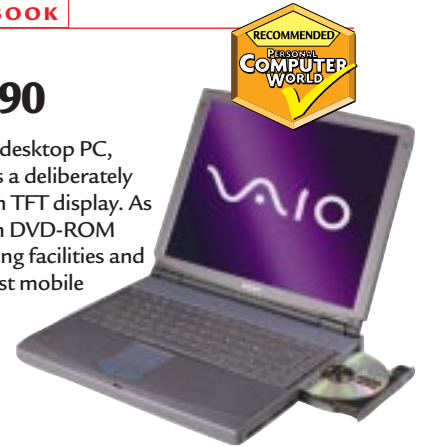
To see how PIII shapes up against PII, see this month's group test (p128).

HIGH-END NOTEBOOK

Sony Vaio PCG F190

Designed to replace your desktop PC, Sony's Vaio F190 features a deliberately large keyboard and 14.1in TFT display. As standard it boasts built-in DVD-ROM and floppy drive, DV editing facilities and the muscle of Intel's fastest mobile chip, the 366MHz PII. Measuring 324 x 40 x 265mm and weighing 3.1kg, it excels as a power portable

► PCW May '99, p84



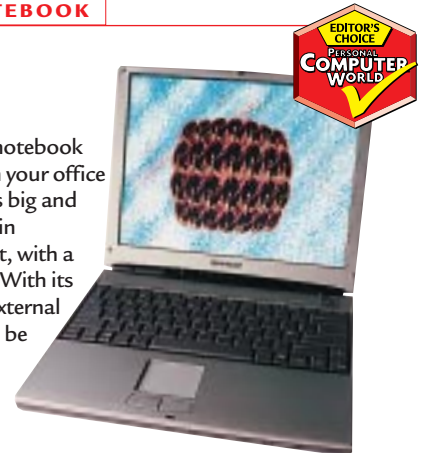
Price £3,006.83 **Contact** Sony 0990 424424
Also Recommended Dell Inspiron 7000 A366LT (PCW April '99)
Price £2737.75 **Contact** 0870 1524850 • Compaq Armada 7800, (PCW March '99) **Price** £3,878.68 **Contact** Contact 0181 332 3000

MID-RANGE NOTEBOOK

Sharp PC-A150

Light and portable, this notebook has enough power to run your office apps, and a screen that is big and good enough to be used in presentations. It is robust, with a magnesium alloy casing. With its excellent keyboard and external floppy drive it could even be used as a desktop replacement.

► PCW March '99, p183



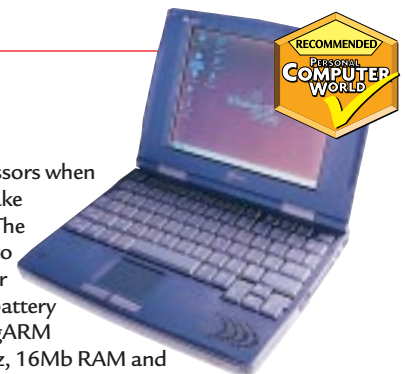
Price £2,109.13 **Contact** Sharp 0800 262958
Also Recommended AJP 1100M **Price** £1,350.08 **Contact** AJP 0181 208 9744 • Sony Vaio 505 **Price** £2301.83 **Contact** Sony 0870 2402408 (both PCW March '99)

PDA

Hewlett-Packard Jornada 820e

Fed up with ever-faster processors when all you need is a machine to take notes and check your email? The Jornada could be the answer to your prayers. You can work for a full day without fear of the battery dying and with an Intel StrongARM processor running at 190MHz, 16Mb RAM and an integrated 56K modem, it has everything you need when on the move. And its 8.2in STN screen with a resolution of 640x480 is large enough to see exactly what you're doing.

► PCW February '99, p120



Price £849 **Contact** HP 0990 474747 **Also Recommended** Psion Series 5
Price £429.99 **Contact** Psion 0990 143050 • 3Com PalmPilot Pro
Price £229 **Contact** 3Com 0800 225252 (both PCW May '98)

COLOUR INKJET

Hewlett-Packard DeskJet 895CXi

For all-round excellence you can't do better than the HP 895CXi. The quality of its output for both text and graphics is impressive given the swift speed at which they are produced. Even its 'econofast' mode could be used for vital documents, saving both time and ink. It takes a huge range of papers and replacing ink cartridges is a breeze.

▶▶ PCW February '99, p151



Price £292.58 **Contact** HP 0990 474747 **Also Recommended** Epson Stylus Color 740 **Price** £272.60 **Contact** 0800 220546 • Epson Stylus Color 850 **Price** £318.43 **Contact** 0800 220546 (both PCW February '99)

COLOUR PHOTO PRINTER

Lexmark Photo JetPrinter 5770

For dedicated digital photographers, this printer is ideal, with a 1200x1200dpi maximum resolution and a slot each for direct access to CompactFlash and SmartMedia cards. There's no separate black cartridge bundled, although any standard black Lexmark cartridge will fit.

▶▶ PCW April '99, p86



Price £349 **Contact** Lexmark 01628 481500 **Also Recommended** Epson Stylus Photo 700 **Price** £273 **Contact** Epson 01442 261144 (PCW September '98)

BUDGET LASER PRINTER

Kyocera FS-600

This personal 6ppm laser printer easily beats all other laser printers in its class. Its speed is impressive, printing out a steady six pages per minute no matter what the paper coverage, and the quality of its output is second to none, both for graphics and text. It is easily upgradable, taking an impressive 36Mb of RAM. It has a PostScript option and there is even an ethernet port that comes as standard.

▶▶ PCW February '99, p199



Price £299 **Contact** Kyocera 0118 923 0660 **Also Recommended** Panasonic KX-P6300 **Price** £257.32 **Contact** Panasonic 01344 853081 (PCW February '99)

BUSINESS LASER PRINTER

Lexmark Optra K1220

It is rare that you find a printer which is both good value and produces exceptional-quality output, yet the Optra K1220 is just such a laser printer. With a rated speed of 12ppm it produces text in good time, but most of all its outstanding quality, both for text and graphics, puts it second to none amongst laser printers.

▶▶ PCW February '99, p201



Price £722.63 **Contact** Lexmark 01628 481500 **Also Recommended** QMS DeskLaser 1600P **Price** £816 **Contact** QMS 01784 445555 • HP LaserJet 4000TN **Price** £1,316 **Contact** HP 0990 474747 (both PCW February '99)

MULTIFUNCTION DEVICE

Hewlett-Packard LaserJet 3100

Good laser print quality from this quiet machine. It's intelligent enough to detect a document dropped into its feeder and it will launch an idiot-proof menu for scanning, copying and emailing. Fast, accurate OCR and 2Mb memory for incoming faxes when the paper supply is exhausted, make the 3100 an ideal multifunction device.

▶▶ PCW June '98, p83



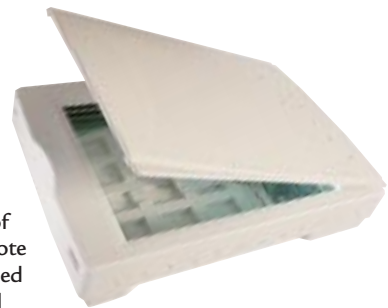
Price £629 **Contact** HP 0990 474747 **Also Recommended** Canon MultiPASS MPC20 **Price** £370.13 **Contact** Canon 0181 773 3173 (PCW January '98)

FLATBED SCANNER

Umax Astra 610P

Once again, the Umax Astra 610P parallel-port scanner has won our budget flatbed scanner group test, boasting an unbeatable combination of performance and value. Note that our three recommended scanners require enhanced parallel ports found only on modern PCs, so users wanting top performance, or those with older systems, should stick to SCSI.

▶▶ PCW September '98, p229



Price £69.33 **Contact** Umax 01344 871329 **Also Recommended** Agfa SnapScan 310P **Price** £116.50 **Contact** Agfa 0181 231 4200 • Microtek Phantom 330CX **Price** £75.95 **Contact** Microtek 01908 317797 (PCW Sept '98)

DIGITAL CAMERA

Canon Powershot Pro70

This good-looking camera takes amazingly good, natural-looking pictures and has enough features to keep any SLR user happy. Its dual Compact Flash slots make for extended periods without having to download, while its 1536x1024 pixel resolution will give you superb prints.

► PCW May '99, p199



Price £999 **Contact** Canon 0121 666 6262 **Also Recommended** Ricoh RDC-4200 **Price** £499 **Contact** Johnson's Photopia 01782 753355 • Olympus C-900 **Zoom Price** £649.99 **Contact** Olympus 0171 253 0513 (both PCW May '99)

MONITOR

CTX PR710T

Not only does the PR710T look gorgeous, its performance is stunning. It sports a genuine Sony Trinitron tube, which is always a good sign. Power regulation, resolution, colour alignment and colour purity are all of the highest order, leading to a display that you can see in special straight away.

► PCW April '99, p182



Price £363.08 **Contact** CTX 01923 810800 **Also Recommended** ADI MicroScan GTS6 **Price** £351.33 **Contact** ADI 0181 236 0801 (PCW April '99)

MODEM

Diamond SupraExpress 56e Pro

With ever-shifting goalposts, it makes sense to go for a modem which supports all the current standards, as well as simultaneous voice and data. Combine this with a roaring speed, superb ease of use and a low price, and you have the best-value modem around.

► PCW December '98, p211



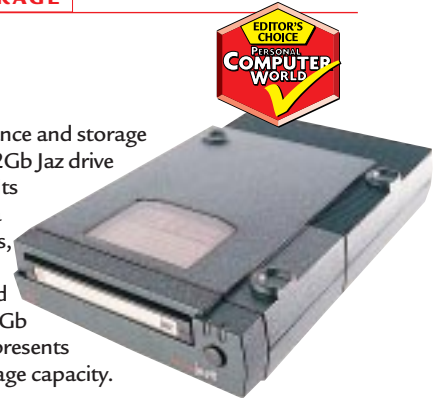
Price £75 **Contact** Diamond Multimedia 0118 944 4401 **Also Recommended** Zoom FaxModem 56Kx **Price** £89 **Contact** SCS Data Communications 01494 748904 (PCW December '98)

REMOVABLE STORAGE

lomega Jaz

If you need top performance and storage capacity, then lomega's 2Gb Jaz drive is the only one to go for. Its speed makes it ideal for a wide range of applications, while the Jaz media feels more solid than most and is fully compatible with 1Gb cartridges. In short, it represents good value for large storage capacity.

► PCW June '99, p168



Price £299 **Contact** lomega 0800 973194 **Also Recommended** Panasonic LF-1500 **Price** £351 **Contact** Panasonic 0800 444220 (PCW June '99)

SOUND CARD

Creative Labs Sound Blaster Live!

SoundBlaster cards have long been the best choice for non-professional users. The SoundBlaster Live! ups the ante, providing near-professional quality sound at a bargain price. And, it comes with an impressive bundle of dedicated digital I/O daughtercard, speakers, subwoofer and games.

► PCW December '98, p92



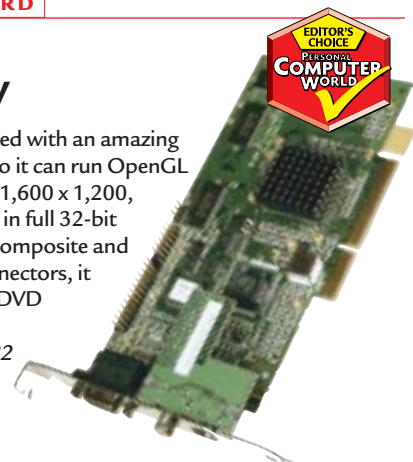
Price £149 **Contact** Creative Labs 01189 344744 **Also Recommended** Terratec EWS64 S **Price** £149.23 **Contact** Terratec 01600 772111 (PCW July '98)

GRAPHICS CARD

ATi Rage Fury

The Rage Fury is fitted with an amazing 32Mb of SDRAM, so it can run OpenGL accelerated apps at 1,600 x 1,200, fully Z-buffered and in full 32-bit colour. Fitted with composite and S-Video TV-out connectors, it also has integrated DVD hardware decoding.

► PCW May 99, p82



Price £159 **Contact** ATi 01628 533115 **Also Recommended** Diamond Stealth 3 **Price** £116.32 **Contact** Diamond Multimedia 01189 444400 • Diamond Viper V550 **Price** £102.23 **Contact** Diamond Multimedia 01189 444400 (both PCW November '98)

ACCOUNTING

Intuit Quickbooks 6

Touted as the easiest accounting package for small businesses, QuickBooks has a long history and a large user base. Version 6 is the first 32-bit incarnation. It even monitors company performance and sounds the alarm should you fall behind.

► PCW March '99, p92



Price £199 (Pro version) **Contact** Intuit 0800 585058 **Also Recommended** MYOB **Price** £229.13 **Contact** Bestware 01752 201901 • TAS Books **Price** £116.33 **Contact** Megatech 01372 727274 (both PCW, June '98)

PERSONAL FINANCE

Microsoft Money Financial Suite 99

Microsoft Money Financial Suite 99 is our choice for personal finance. It offers online banking and updating facilities, as well as Sage compatibility, all at a bargain price.

► PCW February '99, p80



Price £49.99 **Contact** Microsoft 0345 002000 **Also Recommended** Quicken 98 **Price** £39.99 **Contact** Intuit 0181 990 5500 (PCW June '98)

DATABASE

Microsoft Access 97

This industry-standard database application is also the best. With its wizards, infamous Office Assistants and standard Windows interface, Access 97 is relatively easy for the novice. And its powerful relational features and VBA integration make it suitable for developers, too.

► PCW November '98, p220



Price £299 **Contact** Microsoft 0345 002000 **Also Recommended** FileMaker Pro 4 **Price** £169 **Contact** FileMaker 0845 603 9100 (PCW November '98)

DTP

Microsoft Publisher 98

If you want an easy-to-use desktop publishing package, Publisher 98 is the one to go for. Its templates are well designed and attractive, and the business templates look businesslike. Its Wizard process asks intelligent questions and produces a large variety of possible outcomes on the basis of your answers.

► PCW June '99, p158



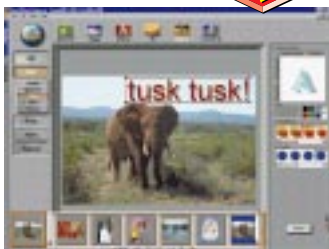
Price £78.72 **Contact** Microsoft 0345 002000 **Also Recommended** Quark Xpress 4.0 **Price** £816.62 **Contact** Quark 01483 451818 • CSP Power Publisher **Price** £49.95 **Contact** GSP 01480 496666 (both PCW June '99)

IMAGE EDITING

Ulead PhotoExpress 2.0

Ulead has succeeded in removing the frustration factor often involved in getting to grips with digital pictures. PhotoExpress 2.0 is a pleasure to use, with a great, clearly structured interface and fast, in-depth tools. It has pre-set editing modes for the novice and custom adjustments for each editing function, so the power user will be kept happy, too.

► PCW January '99, p202



Price £34.95 **Contact** BIT 01420 83811 **Also Recommended** Adobe PhotoDeluxe 3 **Price** £45.83 **Contact** Adobe 0181 606 4001 • Paint Shop Pro 5 **Price** £69.95 **Contact** Digital Workshop 01295 258335 (both PCW January '99)

DRAWING

Corel CorelDraw 9

Still the Windows drawing package to own. Version 9 of this giant suite boasts better drawing and new interactive tools. Artists on a budget should check out Micrografx Windows Draw 6.

► PCW June '99, Reviews, p80



Price £464.13 **Contact** Corel 0800 581028 **Also Recommended** Adobe Illustrator **Price** £351.32 **Contact** Adobe 0181 606 4000 • Freehand **Price** £327.82 **Contact** Macromedia 01344 458600 (both PCW October '98)

INFORMATION MANAGERS

Starfish Sidekick 98



The best personal information manager boasts wide customisation abilities as its greatest strength. For heavyweight contact management, you need look no further than Goldmine 4 (see the details panel, below).



PCW August '98, p204

Price £39.99 **Contact** Starfish 0181 875 4455
Also Recommended Goldmine 4 **Price** £229 **Contact** AVG 0171 335 2222
 (PCW August '98)

REMOTE ACCESS

Traveling Software LapLink Tech

The high-end version of this extremely versatile product, LapLink Tech, has all the features of the standard version but also lets you print from the host machine onto a remote printer, or vice versa, and talk to whoever is using the host machine. It includes anti-virus and hard-disk cloning utilities.



PCW December '98, p233

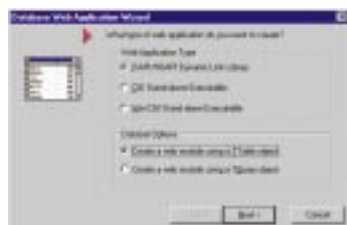
Price £169.95 **Contact** Traveling Software 01344 383232
Also Recommended Symantec pcAnywhere **Price** £75.08
Contact Symantec 0171 616 5600 (PCW December '98)

PROGRAMMING TOOL

Inprise Delphi 4



Delphi is not a cross-platform product, but does let you build browser-independent web applications. It reaches all the way from RAD business applications to fast graphics using DirectX. It beats Visual C++ on ease of use, and Visual Basic on performance.



PCW April '99, p198

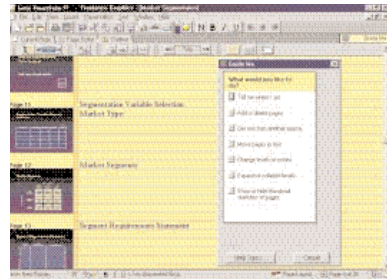
Price from £92 to £1845 **Contact** Inprise 0118 932 0022
Also Recommended Symantec Visual Cafe **Price** £217 or £580
Contact Symantec 0181 317 7777 (PCW April '99)

PRESENTATION GRAPHICS

Lotus Freelance 97



This is our choice for electronic presentations. For you, it may also come down to which office suite you own or are considering, but as part of Microsoft Office 97, PowerPoint won't let you down.



PCW March '98, p200

Price £49.35 **Contact** Lotus 01784 445808
Also Recommended MS PowerPoint 97 **Price** £325.47
Contact Microsoft 0345 002000 (PCW March '98)

WEB DESIGN

Macromedia Dreamweaver 2



An attractive and easy to use interface make this great for those looking for something with a little more power. Good table handling, and extensive formatting options on a single, centralised property inspector, make it a joy to use.



PCW April '99, p103

Price £229 **Contact** Computers Unlimited 0181 358 5857
Also Recommended Adobe PageMill 3.0 **Price** £92.83
Contact Adobe 0181 606 4000 (PCW March '99)

ANTI-VIRUS

Norton AntiVirus 4.0



Norton AntiVirus 4.0 is our choice for protecting your PC. It offers the best combination of features, ease of use and performance. Its virus detection rate is first class and there are free online updates for the life of the product.



PCW April '98, p124

Price £49 **Contact** Symantec 0171 616 5600
Also Recommended Dr Solomon's HomeGuard **Price** £29
Contact Dr Solomon's 01296 318700 (PCW April '98)

Faxback Service

Missed a feature or a review? Try our 24-hour faxback service.

Updated every month, our easy-to-use Faxback service gives you instant access to a complete range of product reviews, features and workshops via your fax machine. To use the service, simply follow the instructions below. Calls are charged at 50p per minute at all times, with an average duration of four minutes.

Our service is available 24 hours a day, 365 days a year. (The faxback service is not available outside the UK).

- 1 From the choices below, select the article(s) you wish to receive. Note the number of pages in the article.
- 2 Using the handset on your fax machine, dial 09065 600632. If you do not have a handset, press the fax machine's On Hook or Telephone button, then enter 09065 600632 on the keypad.
- 3 There will be a vocal introduction to the Faxback service which will ask you to enter the code of the article(s) you require. The voice will then ask you to press the Start / Send button on your fax machine.
- 4 The article(s) you have requested will then come through your fax machine.

IMPORTANT INFORMATION

For the faxback service to work correctly, you must be referring to the current issue of *Personal Computer World* and have your machine set to use tone dialling (you may need to switch your machine from 'pulse' to 'tone').

If you have any problems with the *Personal Computer World* faxback service, please call 0171 412 3795. This helpline is open from 9:00am to 5:30pm Monday to Friday and calls are charged at the standard rate.

Faxback Table

PCs AND NOTEBOOKS	ISSUE	PAGES	CODE
Undercover PCs group test	December-98	20	2005
Xeon server round-up	December-98	4	2006
NT Workstations and Windows 2000 preview	March-99	11	2007
Notebooks (budget, high-end & ultra slim)	March-99	9	2008
Pentium III PCs	April-99	5	2009
400MHz Celeron PCs group test	May-99	11	2010
HARDWARE GROUP TESTS	ISSUE	PAGES	CODE
PDA's and handhelds	May-98	14	2103
Sound cards	July-98	11	2104
Removable storage	August-98	5	2105
Budget flatbed scanners	September-98	9	2107
3D graphics cards	November-98	12	2109
Communications hardware	December-98	11	2110
Digital video	January-99	13	2111
Laser printers	February-99	12	2112
Colour inkjets	February-99	8	2113
USB & 1394	March-99	7	2114
Monitors (17in, 19in and flatpanels)	April-99	11	2115
Digital cameras	May-99	9	2116
Motherboards	May-99	14	2117

PCW Faxback number: 09065 600632

Faxback Table (cont'd)

SOFTWARE GROUP TESTS	ISSUE	PAGES	CODE
Presentation tools	March-98	9	2202
Anti-virus	April-98	9	2204
Accounting and personal finance	June-98	11	2205
Desktop publishing	June-98	12	2206
Information / contact managers	August-98	10	2207
Utilities	September-98	8	2208
Speech recognition	October-98	5	2209
Drawing (illustrative and technical)	October-98	11	2210
Databases	November-98	10	2211
Communications	December-98	10	2212
Image editing (budget)	January-99	11	2213
Image editing (high end)	February-99	8	2214
Web authoring tools	March-99	12	2215
Java and visual programming tools	April-99	8	2216
HANDS ON WORKSHOPS	ISSUE	PAGES	CODE
Client/server databases part 1	April-98	3	2305
Client/server databases part 2	May-98	3	2306
Client/server databases part 3	June-98	4	2307
Client/server databases part 4	July-98	4	2308
Client/server databases part 5	August-98	4	2309
Colour management	September-98	4	2310
Instant messaging	November-98	3	2311
Notebook tips	November-98	3	2312
Linux part 1	January-99	3	2313
Linux part 2	February-99	3	2314
Linux part 3	March-99	3	2315
Web site construction part 1	March-99	3	2316
JavaScript	April-99	3	2317
Remote access	April-99	3	2318
Year 2000 solutions part 1 - hardware	April-99	1	2319
Web site construction part 2	May-99	3	2320
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SMALL BUSINESS WORKSHOPS	ISSUE	PAGES	CODE
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PCW Faxback number: 09065 600632

SUPPLIER'S DETAILS

COMPANY

SALESPERSON'S NAME

ADDRESS

.....

.....

..... POSTCODE

DATE OF TELEPHONE ORDER / / TIME

CUSTOMER DETAILS

NAME

COMPANY

ADDRESS

.....

.....

..... POSTCODE

DATE OF TELEPHONE ORDER / /

ORDERED BY: TELEPHONE FAX POST

ORDER REFERENCE NUMBER (IF QUOTED)

DISPATCH REFERENCE NUMBER

ADVERT APPEARED IN PCW:

ISSUE DATE PAGE

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £
.....
.....
.....

METHOD OF PAYMENT

PERSONAL CHEQUE PURCHASE ORDER CREDIT CARD

C.O.D DEBIT CARD OTHER (SPECIFY)

CARD COMPANY

ISSUE NUMBER (debit cards only)

START DATE / / EXPIRY DATE / /

CARD NUMBER (below) / /

SUB-TOTAL _____

DISCOUNT _____

CARRIAGE _____

SURCHARGES _____

VAT _____

TOTAL _____

SIGNED

DATE/...../.....

DAYTIME TELEPHONE NUMBER

DELIVERY ADDRESS

.....

..... **POSTCODE**

AGREED DELIVERY DATE / /

PCW Purchasing Guidelines

There are several steps you can take to make sure the buying process is smooth and trouble free.

- **When you phone a supplier, make a note of name of person you are speaking to.** Note down any claims they make for the product you are interested in, or any specifications they mention. If you aren't sure if what they are offering is right for the task, then ask. Check what is included: for example, when buying a printer, are all cables and cartridges bundled in? Before you place an order for a PC, insist on being faxed or emailed a full specification, detailing all components and peripherals. Also make sure you get a warranty that suits your needs. If you need swift repairs, consider paying extra for an eight-hour repair service. Also make sure you understand what service you can expect to receive, including who pays for couriers if your machine has to be returned for repair.
- **When you place your order, use a credit card.** The Consumer Protection Act ensures that credit card purchases between £100 and £15,000 are covered. Check the address to which the goods will be sent. Often, if you buy with a credit card you can only receive the goods at the address on the card. If you are buying over the internet, make sure you are using a secure server, sometimes denoted by the prefix 'https'.
- **Set a delivery date, so you have some come-back if the goods are not delivered on time.** When the goods arrive, check the packaging before you sign for the goods, to guard against damage in transit.

chipchat

This month I've mostly been trying to register internet domain names. It's great fun: simply think of a name, submit the request to the official bodies, then wait thirty seconds to be told that it's gone. So you try again, perhaps modifying what you thought was already an obscure or unique name by tagging, say, a number on the end. Submit again, then, surprise surprise, be informed that it's also already been registered. After a while, your initial excitement of registering a domain name begins to flag when you discover that everything has gone – and that includes everything.com.

You could argue that I've left it a bit long in the first place and should have known better, particularly being in the IT business and all. If you've been putting off domain registration, then don't hang around – recent reports have claimed as many as 50,000 a day are being snapped up! The biggies – com, net and org – are managed by Network Solutions <www.networksolutions.com>, while anything dot-uk is down to Nominet <www.nominet.org.uk>.

Tell you what, I'll save you the bother. Almost everything ending in dot-com has already gone, but here's the rub. You see, there are plenty of alternative top level domains to choose from, such as net,

org, and of course co.uk. A handful of half-decent domain names remain available with these endings, and if you're happy with an org.uk, then your options



are almost limitless. But incorrigible snob that I am, I don't really want them.

Online snootiness means that the best-sounding domain names are something short, ending with a dot-com. It's no different from a business wanting a memorable phone number like 0800 654321, or London-dwellers preferring 0171 to boast their exclusive central location. It all boils down to memorability and perception of quality. Web browsers don't help by assuming that single words typed into the address window start with www and end in dot-com.

The trouble is that the whole world knows this, and despite new top level domains being created for specific purposes, such as gov, net and org, the fact remains that everyone wants a dot-com. Plenty of people have registered dot-coms who should really have gone for one of the other top-levels. Forget online porn; this is real net-naughtiness. That people would prefer a country-ambiguous net or com really does illustrate their desirability.

Then again, perhaps I'm taking this far too seriously and should plump for the perfectly reasonable org.uk. The fact that no-one else wants it shouldn't put me off what could become the perennial internet bridesmaid. Maybe I should save my registration fee and just be ivor@some-free-cheapy-ISP. Would you think any less of me? Perhaps it's worth just one

more go on the Network Solutions one-armed-bandit. Damn. I can't believe it: nothingleft.com has also gone... Hello, is that FreeServe?

• *Ivorbugbear.com is currently unregistered.*

➤ The number printed for NetObjects in the May issue of PCW was incorrect. The number should have read 01189 829822.

➤ On page 59 of the May issue, we stated that technical support calls to Telinco were charged at local call rate. They are, in fact, charged at £1 per minute.



next month

PDA's

Why take a notebook out of the office with you, when you can take a PDA? Ian Robson looks at twelve portable powerhouses.

OS group test

Fed up with Windows 98? The PCW experts put Windows on trial and finds the perfect operating system for all platforms.

K6-III

Is it a real challenge to the mighty PIII or just another budget processor? We test ten 400MHz machines.

Also next month:

The future of music over the internet, an interview with Sir Clive Sinclair, and telecomms for small- to medium-sized businesses.



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**JUNE '99 ISSUE >
ON SALE THURSDAY, 29TH APRIL**