

SEPTEMBER 1998

Personal Computer World



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VNU BUSINESS PUBLICATIONS

Editorial

This month's most exciting story came one morning when a press release advised us to attend a conference in just two hours' time! Short notice, but when Nokia, Ericsson and

Psion said they had a big new partnership to talk about, everybody paid attention.

The three companies announced that they were forming a new joint venture called Symbian; Motorola's intention to join added weight from outside Europe.

Symbian's *raison d'être* is to develop and converge wireless information devices

(mobile phones and PDAs to you and I).

The really interesting part is that Symbian intends to use and license the EPOC operating system, as employed on the Psion 5 and, more recently, a Philips Smartphone. Just as Microsoft looked set to dominate the handheld PC and consumer electronics market with its Windows CE OS, it now has serious European competition. For the full story, see this month's Newsprint (p24).

Elsewhere in this issue you'll find the most comprehensive tests we've ever done on colour scanners (p168) and inkjet printers (p180), and a workshop on colour consistency (p214). Power users should check out our group test of 400MHz Pentium IIs (p136), each tested under Windows 95 and NT 4. If you' already have several PCs and are wondering how to get them talking to each other, our second small-business feature guides you through setting up a network (p120).

Gordon Laing, Managing Editor

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Next Month



A new look for Personal Computer World. We've redesigned the entire magazine to make it easier to find the information you're looking for. Detailed explanations are still on hand to provide you with the leading industry comment and advice you've come to expect. And all at a very special price of £2.25 for one month only.

Digital cameras

With superb megapixel quality at affordable prices, we put a round-up of the latest digital cameras in the frame.



Service and reliability

PCW readers have taken part in the industry's biggest independent survey of service and reliability. We name the brands and services you voted for.

IT and Formula 1

Schumacher, Hill and Villeneuve rely on state-of-the-art computers to design cars and analyse the finest details of every race. We hung around the pits to check out the IT behind Formula 1



eCommerce

Electronic cash transactions and credit card sales explained. We show you how to really make money from your web site.

New-look October '98 issue

■ On sale Thursday 27th August

* Next month's contents subject to change.

September cover disc

Thirteen featured products including eight of the latest top games around. In this month's Software Library there's RealNetwork's RealPlayer, enabling you to play streaming audio and video from the Internet, plus in Hands On Software there's the Windows NT 4 Service Pack 3.

IMPORTANT NOTICE

The publisher, VNU, has checked the PCW CD for known viruses at all stages of production, but cannot accept liability for damage caused either to your data or your computer system which may occur while using the disc or any software on it. If you do not agree with these conditions, you should not use the disk. It is good practice to run a virus checker on new software before running it on your computer and to make backup copies of all your important data. Unless otherwise stated, all software on the CD is for demonstration only. This means it may be restricted. It may be time-limited or have certain functions disabled.

Getting software on to the CD

Personal Computer World is keen to promote quality software and would like to hear from you if you are interested in having your product included on a future cover disk. For cover-mount enquiries, please telephone Afshan Nasim on 0171 316 9761 or email afshan-nasim@vnu.co.uk

How to use the CD-ROM

Quit existing applications. (If you have 16Mb or more of memory you don't have to do this, but will still get better performance if not too many other apps are running.) 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 Program Manager choose File/Run, type <CD Drive>:\pcw.exe, press enter.

System requirements

You will need a PC with Windows 3.1 or later. Please check individual products for specific system requirements. For best results, run the CD on a Pentium PC with at least 16Mb of memory.

CD-ROM problems

The technical helpline is open weekdays from 10:30am to 12:30pm and 1.30pm to 4:30pm on **01274 736990**. If you experience problems with the CD-ROM, such as a message like "Cannot read from drive D:", return the disc with a note

iBase: apology

Base Image Systems Ltd

The June 1998 issue of the *Personal Computer World* cover CD included a software product called I-Base, from a company called POW. The logo and text used to represent this software on the disc were NOT part of that product and actually belonged to a company called "iBase Image Systems Ltd". "iBase Image Systems Ltd" is a different company specialising in scaleable image database solutions and digitisation services. It has no relationship with the product on the CD, or its distributor. If you would like more information about "iBase Image Systems Ltd", please telephone +44 (0)1943 603636 or visit the web site at www.ibase.com.

bearing your name and address and clearly marked "PCW CD SEPTEMBER 98", to: TIB plc, TIB House, 11 Edward Street, Bradford BD4 7BH. A replacement disk will be sent by post.

Incoming



Until the end of the 20th century, increased sightings of UFOs had been largely ignored by Earth's governments. But now UFOs are threatening Earth space missions and NASA must mobilise an international movement to investigate.

Incoming is a frantic multi-vehicle, shoot-em-up where you control a variety of defence vehicles. From gun turrets to combat aircraft, you take part in various missions including attack, defence, interception, re-supply, escort and more. The full game features four principal scenarios of ten missions which are each vital to the success of the overall campaign.

The demo requires DirectX to be installed. You will be given the option to install DirectX during installation. If this doesn't work, install the latest version of DirectX from the Utility section of the Software Library.

PCW Details

Operating System	Windows 95
Limitations	2 levels playable plus rolling demo
Sales Contact	0151 933 2688
Technical Support	0121 452 8400

Motorhead

You've shifted up to fifth gear and accelerated to 200mph, your pursuers are gaining and threatening to overtake. Time stands still as you brace yourself for the crash, but at the last minute you only hit the barrier with your rear wing.

In Motorhead, speed makes all the difference. Races are set in the future, taking place at the six venues of the Transatlantic Speed League. These range from highways to abandoned mining facilities. Success in a race is rewarded with more cars and courses.

You can expect spectacular crashes, breathtaking speed and constantly changing conditions courtesy of an impressive AI. Unlike traditional racing games, there are no fixed paths or static patterns in the Motorhead engine. Other features include a 3D engine capable of 600,000 textured polygons per second, cars of 300 polygons each and real 3D world collision and physics.



PCW Details

Operating System	Windows 95
Limitations	One track only
Sales Contact	services@gremlin.co.uk
Technical Support	None available

CD-ROM Helpline 01274 736990

Panzer Commander

WWII tanks varied widely in their performance capabilities. British infantry tanks like the Matilda II could achieve a mere 24kph, while the American M18 tank destroyer could reach 80kph. With these differences in mind, Panzer Commander challenges you to balance your tank's performance, fuel usage and weaknesses to succeed on your missions.



The game's strategy requires you to get points by reaching the factory complexes, destroying enemy tanks and crossing rugged and varying terrain. The demo contains two scenarios: a German and a Russian front. Available to you are full navigation controls, speedometer, oil and fuel gauges, to make sure your vehicle runs efficiently and smoothly. Efficient operation will in turn earn you extra points. The text on the CD provides a summary of what to expect on the two fronts. Panzer Commander requires DirectX 5.0 or later.

PCW Details

Operating System	Windows 95
Limitations	1 Level Only
Sales Contact	01444 246333
Technical Support	01444 239600

Oddworld

As far as plots go, this is a good one! In a world run by ruthless meat barons, your entire race is about to become pie filling.

That is, unless you can escape RaptureFarms and make it through this challenging game and win the day. Oddworld offers a refreshing world of interaction where you communicate with real characters, "possess" and destroy your enemies, and solve curious and wicked situations that develop as you play. Oddworld is a hybrid of game genres, blending them into an entertaining package. High-quality graphics, "gamespeak" and "shadowplay" (where you get to "hide" in the shadows) all make this a challenge.

The puzzles that appear along the way will test your reactions and your brain power. The music follows the pace of the game and infinite lives mean you've just got to keep on trying.



PCW Details

Operating System	Windows 95
Limitations	One level only
Sales Contact	0171 565 7300
Technical Support	None available

Commandos

Engage in a battle of wits and wills with the most ruthless military force in history. Another game set against the backdrop of WWII, Commandos is a real-time tactical wargame where you command a squad of elite Allied Commandos. Your job is to complete 24 dangerous missions behind enemy lines by thwarting the German war effort, using sabotage and tactical genius.



You control six individual commandos, each with a specific skill, as they infiltrate hostile territories and engage in intense combat. Scenarios range from the parched desert of North Africa to the mountainous fjords of Norway. The game uses advanced AI to control over 40 enemy vehicles and troops, and makes available 25 weapons and explosives from the era. The game can be viewed from up to six simultaneously active camera angles and offers multiplayer across the internet, a LAN, and Mplayer.

PCW Details

Operating System	Windows 95
Limitations	Function limited (only six missions)
Sales Contact	0181 636 3000
Technical Support	0121 356 0831

Team Apache

Team Apache is a combined 3D flight sim and combat game which hopes to answer the prayers of all those action combat fans who want a little more from their helicopter games. With real-time weather and lighting effects, stunning 3D graphics, team management and even network deathmatch or team play, Team Apache is certainly an exciting prospect.



The full version offers two campaigns, Colombian and Russian, which must be played sequentially. You will have to maintain sufficient resources to fly missions in the given time (enough Apaches or rested pilots). You could keep the morale of your pilots up by ordering goodies for them but remember that this will slow down the arrival of other spare parts which could reduce the repair time on Apaches. The game supports all major 3D cards and campaigns can be fought head-to-head if played across the internet or a network.

PCW Details

Operating System	Windows 95
Limitations	One level only
Sales Contact:	01444 246333
Technical Support	01444 239600

CD-ROM Helpline 01274 736990

World League

The World League Soccer full version provides arcade quality action from over 190 teams. The teams, chosen from ten countries and playing in their national leagues, play in a range of tournaments. There is a facility to play a World super-league by mixing and matching clubs from all of the different nations. Games can be played in fast or slow modes, and AI builds anticipation into the game. Les Ferdinand supplied the motion capture information, and a dynamic camera rolls, pans, zooms and tilts to produce a smooth view of the field. Your game can be subjected to different weather like rain, wind, snow, thunder and lightning. Commentary is provided by Italian Football's Peter Brackley and Ray Wilkins.



PCW Details

Operating System	Windows 95
Limitations	Two sides only (England and Germany), 1 stadium, 2.5 minutes each way
Sales Contact	0181 636 3000
Technical Support	0121 356 0831

World Rally Fever

Brought to you by Team 17, World Rally Fever is a fast, fun Manga-style arcade racing game. In the full version you compete on ten different tracks in locations all around the world.



The graphics style may be fun but this game is serious. There are four difficulty levels that utilise increasingly difficult levels of AI, so your fellow (computer) competitors will keep you on your toes! You are faced with natural obstacles and "traps" laid by the computer, like crates in the road and random changes to the controls. In turn you can use bombs to sabotage your opponent's chances. This demo version contains no sound and it is recommended that machines are rebooted into DOS mode to play.

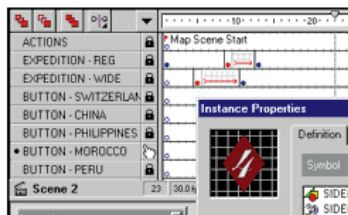
PCW Details

Operating System	Windows 95
Limitations	No sound, one driver, one track
Sales Contact	01924 215299
Technical Support	None available

Flash

Flash has become something of a standard for interactive vector graphics and animation for the web. There are sites

everywhere that have used Flash to create spectacular, resizable, and extremely compact navigation interfaces, technical illustrations, long-form animations, and other dazzling effects. The program produces graphics and animation that will anti-alias and scale based on the viewer's screen size, providing high-quality viewing. This version has transparency and shape blending effects. Other features include movie clip and button actions, to create sophisticated interactivity without scripting, an updated interface design and improved functionality.

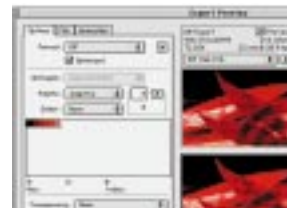


PCW Details

Operating System	Windows 95
Limitations	30-day trial
Sales Contact	0181 200 8282
Technical Support	0131 458 6776

Fire works

Fireworks is a suite of text, design, illustration, image editing, URL, JavaScript, and animation tools that can create everything for a web site, without having to jump from application to application. The program lets you edit, optimise and preview output in every popular format. Everything remains editable all the time. A number of flexible drawing tools are available including sophisticated brushes for creating unlimited shapes and objects. There is no singular application that can honestly do everything that this package can do. The only way to have this amount of editing power would be to run five or more separate programs.



PCW Details

Operating System	Windows 95
Limitations	30-day trial
Sales Contact	0181 200 8282
Technical Support	0131 458 6776

Cyber Angel

During installation of Cyber Angel you will be requested to input a licence key; please enter "EVALUATION" when requested. The CyberAngel offers protection against hardware theft by covering prevention, protection, detection and recovery.

If your computer is stolen or used by an unauthorised person, three failures to key in the correct password will result in a notification message being sent to the Computer Sentry Software server (and to a chosen fax or email address). The message contains the IP address from which the machine is operating. The machine can be made to lock-up, rendering it useless.



IMPORTANT

The evaluation period on this demo is intended to last from July 29th through to September 15th 1998, during which time the customer will have 30 days of monitoring from CSS. To uninstall this demo, run the program supplied by

Century Systems Software. From the PCW CD, run the file

`<CD drive>:\config.exe`

Enter your Cyber Angel password and then select the UNINSTALL button.

PCW Details

Operating System	Windows 95
Limitations	Fully featured for 30 days from July 29th but not active after Sept 15th 1998
Sales Contact	0181 956 2531
Technical Support	0181 956 2465

CD-ROM Helpline 01274 736990

Ability Office

Ability contains four fully integrated modules in one suite: a powerful word processor, a sophisticated spreadsheet, an outstanding database (including business forms and reporting), and a set of drawing tools.

Integration between modules includes formulas that can refer to data in any other Ability application, a word processor and spreadsheet that can browse table information from a database, and the facility to use database information in calculations.

The spreadsheet can perform mail merges, just like the word processor, and a single recalculation engine which will update links anywhere in all documents automatically. The program manages to complement existing office products rather than compete with them, ensuring that the majority of office product users will immediately feel familiar with its use.

ability98
spreadsheet
database
write
office

PCW Details

Operating System	Windows 95
Limitations	30-day trial
Sales Contact	0171 231 1004
Technical Support	pcw_support@ability.com

Taxi

Taxi is designed to make the Internet easier to use by "learning" about your preferences over time, and delivering customised content directly to your desktop.

The program contains features like My Reporter and Auto Suggest, which continually monitor your actions to recommend new online destinations. An internal update system keeps a record of the latest news and content changes that interest YOU on the web and then automatically collects it at regular intervals. By using a discreet background update system to make efficient use of unused online connections, the program will deliver the information you want and make it available to view offline, at your convenience, saving both time and money.

Taxi also supports an unlimited number of users, with password protected settings which allows flexibility and personalisation from one package.



PCW Details

Operating System	Windows 95
Limitations	Full version
Sales Contact	0870 6039067
Technical Support	0870 6039067

Software Library

Essential Utilities

Add/Remove 4Good 1.0 (Win 95)

The utility that helps rid you of those unwanted entries in the Control Panel Add/Remove list. (Limited use shareware)

Adobe Acrobat Reader 3 (Win 3.1/95)

The free Adobe Acrobat Reader lets you view, navigate, and print PDF files across all major computing platforms. (Fully functioning reader.)

Cute FTP (Win 3.1)

An easy way to utilise the capabilities of FTP. (Shareware)

NEW Disk Piecharter 2.1a (Win 95/NT)

Graphical Disk Explorer shows piecharts of disk usage. Supports long filenames, multi-threading and all filesystems. (30-day evaluation)

DirectX 5.2 (Win 95)

Latest set of essential video and audio drivers required to run some of today's processor-hungry games and applications. (Fully functioning drivers.)

EzDesk for Windows 1.8 (Win95)

This manages the desktop icons' layout. EzDesk can restore a desktop icons' layout to a previously

saved arrangement. (Limited function shareware)

Fontastic 4.0 (Win 95)

A powerful font management tool designed for Windows 95. It allows quick and easy access for viewing all of the fonts stored within your system as well as providing printed samples. Includes freeware font pack. (31-day evaluation)

NEW Forté Free Agent 1.11 (Win 3.1/95)

Forté Free Agent is a powerful and easy-to-use Usenet newsgroup reader. It allows you to browse newsgroups both online and offline. (Freeware)

GIF Construction Set 1.0Q (Win 3.1/95)

The quickest and most professional way to create transparent, interlaced and animated gif files for web pages. (30-day shareware.)

Graphics Workshop 1.1Y (Win 3.1/95)

Graphics Workshop is a superlative image management package that allows you to view, convert and catalogue your images in a wide variety of formats. (30-day shareware.)

NEW Liquid MusicPlayer 3.0 (Win 95/NT)

The Liquid MusicPlayer CD is software which lets you preview and purchase CD-quality Internet singles over the Internet. Exclusive Dolby® Digital

technology provides superior sound, while viewing album graphics, lyrics, and liner notes. It's like an on-line version of a typical CD. But it's more than simply on-line music. Manufactured under license from Dolby Laboratories Licensing Corporation. (Freeware)

Lycos Internet Explorer (Win 95/NT)

Helps you manage and organise your web searches. (Full version)



Microsoft Internet Explorer 4.0 (Win 3.1/95)

Surf the internet with the latest versions of Microsoft's Internet Explorer for Windows 3.1 and 95. (Fully functioning unregistered version.)

Microangelo 2.1 (Win95)

Provides access to icons of all sizes and colour formats used by Windows 95. Browse, manage, create, and edit icons from 8x8 to 64x64 pixels in size and up to 256 colors. (30-day trial)

CD-ROM Helpline 01274 736990

Software Library (continued)

MIRC 5.31 (Win 3.1/95)

Provides a user-friendly interface for use with the Internet Relay Chat network. The IRC network is a virtual meeting place where people from all over the world can meet and talk. (30-day shareware.)

NearSite 6.1 (Win 95)

NearSite allows you to retrieve and store internet files so you spend less time on-line. NearSite bookmarks can be set to automatically retrieve web pages from the internet and keep them refreshed as often as you wish. (30-day evaluation)

Net Toob 3.5 (Win 3.1/95)

NET TOOB Stream enables playback of online streamed and online and offline downloaded MPEG-1, Video for Windows (AVI), QuickTime for Windows (MOV), QuickTime VR "object" files, Autodesk Animations (FLC/FLI), WAV audio and MIDI audio. It is reliable, easy to use and integrate, and works with multiple browsers. (Function limited shareware)

Netscape Communicator 4.05 - Standard Edition (Win 3.1/95)

It's been a while since Netscape last appeared on the PCW CD, but now it's back and better than ever. One of the premier internet suites, including Netscape Navigator. (Free version)

Paint Shop Pro 3.11 (Win 3.1)

Fully-featured painting and image-manipulation program. Features include powerful painting tools, photo retouching, image enhancement functions, batch file format conversion, and support for over 30 different file formats. (30-day shareware.)

Paint Shop Pro 5.0 (Win 95)

Paint Shop Pro 5 is the latest version of this popular graphics editor, with powerful new features such as complete layer support, Picture Tube brushes, CMYK separations and pressure-sensitive tablet support. Also includes enhancements to Paint Shop Pro's flexible painting and retouching brushes, adjustable cropping and selection tools, and image enhancements. (30-day evaluation)

SpellWrite for Windows 1.6/2.1 (Win 3.1/95)

A unique utility that can spell-check any Windows program instantly (eg. email, accounts, database etc.) from a designated hot key. It has an 85,000-word dictionary in UK format. (30-day shareware).

VuePrint Pro 6.0c (Win 3.1/95)

VuePrint is the most widely used Windows program for viewing images. You don't need to know anything about images or file formats to use VuePrint: tell it to open a file, and it displays any images it finds in this file. (15-day evaluation)

WinZip SR 6.3 SR-1 (Win 3.1/95)

Industry-standard compression/decompression utility for Windows 3.1 & 95 with automatic built-in disk spanning support for multi-disk Zip files. (21-day evaluation version).

NEW 3D Stars and Stripes (Win 95)

Stunning graphical 3D Las Vegas slot machine on your desktop. (Shareware)

BombGolf 1.01 (Win 95)

Bomb Golf is a fiendish miniature golf featuring four courses of nine holes, playable through four different games including a special multiplayer game (up to four players). (Shareware)

Calc 98 4.5 (Win 95/NT)

Calc98 is a pocket calculator simulator with many features and great flexibility. It is especially designed for scientific and engineering users and includes a wide range of unit conversions and scientific functions. It also has statistics, financial and time functions, including a stopwatch. (Freeware)

Chimp! 1.10a (Win 95/NT)

Chimp! provides a convenient place for keeping to-do lists, reminders and miscellaneous information. Chimp!'s interface is based on the model of a tabbed notebook: each file is divided up into a set of topics, each of which is displayed as a tabbed page. (Shareware)

DesignCAD 97 9.0 (Win 95/NT)

DesignCAD 97 is a comprehensive computer-aided design package that incorporates a full range of 2-D and 3-D drawing functions. (30-day evaluation)

EZSubmit 1.2 (Win 95/NT)

EZSubmit is designed to publicise your web sites quickly and easily. You can prepare and submit batches of URLs and even run submission jobs unattended. (Limited demo)

Hockey Pong 1.3 (Win 3.1/95)

A fast ball game in which your goal is to score as much as possible. It also provides a very powerful system of match management, including teams and events editors allowing you to create and customise your own tournaments. (Shareware)

Norton Utilities 3.0.3 (Win 95/NT)

Norton Utilities is an integrated suite of programs that can help you find and fix computer problems, improve your computer's performance, perform preventative maintenance tasks, and troubleshoot your system. (30-day trial)

Nuts & Bolts 1.04 (Win 95)

Nuts & Bolts is a suite of powerful Win95 utilities

that helps you keep your PC working at optimum efficiency and speed. (30-day free trial)

PC Anywhere (Win 95/NT)

Teh worlds most widely used remote computing solution. (Limited demo)

Rave eJay (Win 3.1/95)

Welcome the newest member of the eJay family. Rave eJay turns your PC into a music machine with many rave samples and a fully-fledged eight-track recording studio. You'll be able to create your own Rave music in no time. (Limited demo)

Realplayer (Win 95)

Premier real time Internet audio and video delivery. (Full version)

Screenruler (Win 95/NT)

A great virtual ruler ready to be gdragged around your desktop. (Shareware)

Showsize (Win 95/NT)

Easy to use hard disk manager with display of directory sizes. (Shareware)

Slay (Win 95)

Capture the island by conquering enemy territory. (Limited demo)

Talk Back Limited Edition (Win 95/NT)

Talk Back gives your computer a voice. It's a bit of talking software. It will talk to you, and read almost any text from Windows applications in English. A full version of Talk Back is available to PCW readers at a special price of £35 inc VAT and free copy of Talk Back customizer (RRP of Talk Back alone normally is £39 ex VAT and normal price of Customizer £15 ex VAT). (Limited edition)

Urdu PageComposer3 (Win95/NT)

The PageComposer 3 establishes new levels of performance and sophistication in Urdu/Persian/Arabic Desktop Publishing.

■ **SPECIAL UPGRADE OFFER!** PCW readers can upgrade to the full professional version of Page Composer 3 for £99! (Limited Demo)

Web Catalogue Builder 3.0s (Win 95/NT)

WEB Catalogue Builder provides powerful inventory functions that allow you to easily organise any kind of structured data. HTML Wizard PRO part of the WEB Catalogue Builder allows you to quickly create WEB catalogues, stores, tables, directories or HTML reports. (30-day shareware)

Zip Magic (Win 95/NT)

An easy way to access zip archives. (Limited Demo)

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AOL Trial



Easy-to-use internet online service **FREE** this month with 50 hours online time! AOL channels cover everything from the latest News & Sports to Travel & Entertainment.

Make internet access easy: go directly to web pages from your AOL menu bar. AOL offers 33.6k access speeds nationwide and has Internet Explorer 3.0 integrated as its browser. 350,000 UK subscribers can't be wrong!!!

- 50 hours online!
- One month's AOL membership!
- Five email addresses per account!
- Free technical support!
- 10Mb web space!
- 100 percent local call access!

Run the software from the main screen or from the Software Library ISP section.

PCW Details

Platform	Windows 95 and 3.1
Limitations	One month free membership, 50 free online hours
Contact	0800 376 5432

ClaraNet Trial

ClarnaNET offers full internet access, including email, the web and newsgroups. Packages include free 24-hour technical support, 100 percent local call access in the UK, no connection or start-up fee and **FREE** technical help to set up your web pages. ClaraNET support both K56 Flex and US Robotics X2 technologies and you also get 25Mb of web space free with your account.

Try out ClaraNET **FREE** for a month and if you decide to continue you will be billed at the end of your trial month.

Please read the [Terms and Conditions](#) online for full information.



You will need:

- IBM-compatible PC running Windows 3.1 or higher
- 4Mb RAM (minimum), 8Mb recommended
- 20Mb free hard disk space
- 14,400bps modem or faster

PCW Details

Platform:	Windows 95 and 3.1
Limitations:	One month free, billed if use of service is continued
Contact:	(Account Enqs.) 0845 3551000 Technical Support 0845 3553000

CompuServe

CompuServe is the UK's leading service offering fast and easy access to the internet and its own exclusive online services. Install CompuServe now and enjoy one month's free trial including:

- **FREE** 650 hours online time*
- **FREE** personalised email address
- **FREE** web space

CompuServe is a global information service and all prices are set in US Dollars. You will be charged in your local currency. Membership is US\$9.95 per month. This offer is valid for the first month only. The free online time must be used in the first month.



PCW Details

Platform	Windows 95 and 3.1
Limitations	One month free membership, 650 free online hours to be used in first month
Contact	0990 134819

CD OnLine

Want to find out more about what's on the CD? By clicking on the web link banner at the top of the main screen you can run your browser and access *PCW* CD OnLine.

CD OnLine is an extension of the normal CD, giving you up-to-date access to sites and information relating to the actual content on this month's disk. In addition to the *PCW* web site, vnu.net.com and Jobworld.co.uk, you can access the web sites of the companies who have software on this month's CD.

There's a continually updated Technical Info page and a preview of what will be on next month's CD! Plus you can subscribe via email while you're online!



JOBWORLD

Jobworld.co.uk is a free service which provides you with access to thousands of new IT, business and finance vacancies every day. All you have to do is browse the site by job sector or search on a specific set of job skills or requirements.

The Jobworld Email Alert service offers extra freedom by sending only details that match the job seeker's preferences, allowing the recipient to control exactly what information is sent and when.

Jobworld also offers links to job sites

overseas, a guide to IT contracting and comprehensive lists of jobs from the top recruitment agencies in the UK.Jobworld.co.uk.

VNUNET

Vnuset.com offers speed of delivery, accuracy and breadth of coverage from five market-leading weekly newspapers: Computing, Accountancy Age, PC Dealer, Network News and PC Week generating up to 50 stories every day of the working week. With correspondents in Europe,

the US and Asia contributing daily to the VNU Newswire, a round-the-clock news service is available at vnu.net.com.

More detailed information is available in a wealth of in-depth articles, covering news analysis and product reviews, from VNU's stable of monthly publications, including such titles as Personal Computer World and Management Consultancy, plus some of the best editorial material from VNU's portfolio of 15 business and consumer titles.



CD-ROM Helpline 01274 736990

Newsprint

Speedy Xeon feels Alpha breathing down its neck

Intel has finally launched its 400MHz Xeon processor in a bid to break into the high-end workstation and server markets. The Xeon supports four-way and eight-way multiprocessing and is said to be between 60 percent and 90 percent faster than the Pentium Pro. It uses the new Slot II and is the size of a small paperback.

Bulk prices are \$1,124 for the 512Kb version, and \$2,836 with 1Mb cache, compared with \$1,045 and \$2,675 with 200MHz for equivalent Pentium Pros.

The launch is part of a new Intel strategy of offering different processors for different tasks. The Xeon could help Microsoft NT's inroads into the Mac-dominated graphics market.

It also means designers can use the same machine for graphics and business software, Intel says.

Intel has delayed launching its 64-bit Merced until late next year. This opens a window for the Alpha which will for a time be the only chip able to use forthcoming NT 5.0's 64-bit addressing. Compaq, which bought Alpha developer Digital, is to sell Alpha workstations – see page 31.

● Tim Bajarin, page 42

Brave Psion goes for Microsoft Achilles heel

A deal between palmtop pioneer Psion and three leading mobile-phone makers presents the first credible challenge in years to Microsoft domination.

Psion has formed a new company called Symbian with Ericsson, Nokia and Motorola to exploit Psion's Epoc32 operating system. This is best known for its use in Psion's Series 5 handheld. It is a general-purpose real-time operating system crafted to the demands of the next generation of mobile devices.

The three mobile phone vendors between them have more than 50 percent of the market. This means that in terms of numbers, not revenues, Epoc 32 could sell more than Windows. Certainly it will be in a better position to fight off Windows CE, which has been adopted by many handheld vendors.

Epoc32 is already licensed by Philips for use in a SmartPhone. But the implications of the deal go way beyond phones. The market in smart devices is set to

become bigger than that for PCs. Three factors could help Symbian do well in it:

- CE is popular with PC users who like its 95-style interface. This will not be a selling point among PC-naive users of new devices. And courts, wary of entrenching a monopoly, are likely to be indulgent with software which copies the Windows look-and-feel.
- Big office systems may need Microsoft software but client devices don't – not if they can talk to the network and handle MS-compatible files. They are Bill Gates' Achilles heel.
- Consumer vendors do not want to be in thrall to Microsoft.

The new DeskLite (see opposite) presages a world in which in Acorn's words, a computer becomes a "stationery cupboard item", issued as casually as a new pen. It is not a world that will

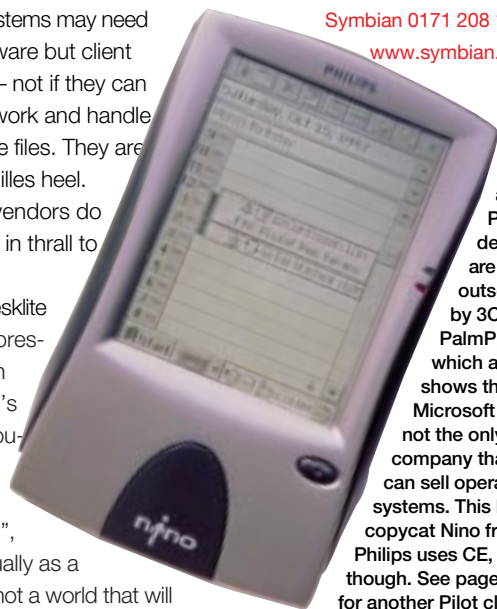
long tolerate overpriced, over-weight software.

Microsoft is not going to go away – already it is announcing a deal with Hitachi to boost the real-time facilities in CE. Nor is Symbian bound to succeed. But there's a real chance the market might swing from Microsoft and give Bill Gates his comeuppance.

Clive Akass

Symbian 0171 208 1800

www.symbian.com



CE and Psion devices are both outsold by 3Com's PalmPilot, which also shows that Microsoft is not the only company that can sell operating systems. This Pilot copycat Nino from Philips uses CE, though. See page 36 for another Pilot clone.

Users play wait and see over Windows 98 bugs

Microsoft is playing down reports from big PC makers – including Compaq, Dell, Toshiba and IBM – that there are problems in upgrading to Windows 98.

Readers have also reported driver problems and many have decided to delay upgrades until these have been sorted out.

Microsoft says the main problem, concerning the On Now advanced power capability, has

been "blown out of all proportion" and a fix would be posted soon on the Win98 update site.

Microsoft also confirmed that it plans to release a multimedia update kit for DirectX, with individual components being made available on a trickle-feed basis.

Win98 product manager Dave Weeks said users should not be put off upgrading as "99 percent of users are having a

trouble-free installation."

He admitted that there had been "some minor driver issues" but was confident that fixes would be available soon.

PC World opened its 17 stores at midnight on launch day and sold 1,000 copies before 1am. A further 4,000 were sold during normal trading hours the following day.

Microsoft says that in its first

first four days Win98 sold 20 percent of first-year Win95 sales.

Two days before the launch Microsoft won a big victory when two judges upheld its appeal against a ban on it bundling Internet Explorer with Windows. The decision does not end the anti-trust action, which resumes in September. **Sue Pederson**

Additional reporting, VNU Newswire

● See Barry Fox, page 57

News edited by Clive Akass; news@pcw.co.uk ● Internet News edited by Susan Pederson; susan_pederson@vnu.co.uk



■ Small offices and schools, a big potential market for Acorn's Desklite (*below*), may start looking at building intranets around devices like the little blue box (*pictured, left*). It's an award-winning Cobalt Qube server, which claims to provide virtually a plug-and-play intranet. It runs on the Unix clone Linux OS, which costs precisely nothing. Qube prices start at around £625. Cobalt is just starting its European operation but the machines are available here. Details on www.cobaltnet.com or call 31 70 517 6375

Short stories

AOL buys into interactive TV

■ AOL is in the final stages of producing an interactive TV service following its buyout of the US arm of Netchannel. "We are creating a better version of TV, not making the internet into something it isn't," stressed Barry Schuler, president of AOL Interactive Services.

AOL TV will include a creative navigator, so you will be able to quickly track down the programme you want from the many channels on offer.

In parallel developments, UK interactive TV pioneer Two-Way TV has been bought by Cable and Wireless. And NetChannel UK has been bought by cable giant, NTL.

Jan Howells

● *Networks get a voice, p26*



■ Convergence has even hit the monitor world. This 17in Tatung C7E4RTK model doubles as a TV and costs £399 (inc VAT).
VIP 0161 877 6222

£120 computer highlights soaring cost of Windows

A new Acorn-designed Windows machine, unveiled at last month's Networks 98, could present a new challenge to Microsoft pricing. The Desklite terminal will cost about \$199 (about £120) if mass produced, which is less than half the cost of the NT operating system running its programs.

These actually run on an NT server. The Desklite *appears* to run them but, like all Windows terminals, it simply acts as a display and input system. It relies on the new multi-user Terminal Server version of NT with Citrix's Metaframe driving the Acorn's non-Intel hardware (built around a system-on-a-chip developed by Cirrus Logic from a 32-bit core from Acorn stablemate, ARM).

The Desklite is a reference design which is sold to manufacturers rather than users. Its big advantage is that it cuts the cost and hassle of maintaining networked machines.

This means few corporates will question the fact that Microsoft charges around £240 for a full NT workstation licence for each Windows terminal, plus the cost of the server-side operating system. But the Desklite will concentrate minds on the growing disparity between hardware and operating-system costs at a time when Microsoft's use of its market strength is under close scrutiny.

As Graham Lea pointed out last month (*Newsprint*) Windows accounts for around ten percent of the cost of an entry-level PC compared with one percent a decade ago. True, Windows is more complex now, and Microsoft, as it is not slow to point out, has considerable

development costs which it must recoup.

Microsoft does not have an absolute monopoly and its pricing could turn out to be a big mistake in the long term. As the Psion story (*opposite*) highlights, client devices are an area in which Microsoft is vulnerable. Symbian's new OS, based on Psion's Epcoc 32, will cost \$5 to \$10 per device. It is no NT; but to run simple office apps, it doesn't need to be.

Acorn is happy to provide devices for whatever OS. But senior marketing manager Steve France said: "No-one is going to get sacked for buying Microsoft. Someone has to make the jump to another technology for it to take off, so people can see that it works."

Consultant Martin Healey, emeritus professor at the University of Wales, is scathing about Microsoft charging through the roof for what is supposed to be a measure to reduce cost of ownership. He says the NT/Citrix set-up is not truly multi-user because it runs a separate virtual machine per user. But he welcomes it with faint praise: "It is very good as a stopgap until something better comes along that does the same thing." That something is a mature Java able to deliver applets efficiently, as needed.

Clive Akass

Acorn 01223 725000,

www.acorn.com

● *More Networks news, p26*



"Damned thief ignored all the hardware and ran off with my shrink-wrapped copy of Windows NT"

p26 >

Networking shorts

Wireless alternative to costly leased line

■ Tele2 UK is launching a radio-based net connection offering a permanent 128Kbps link to the internet or a company intranet for from £65 a month. More money will get you up to 384Kbps, and 2Mbit/sec is on the horizon.

The new service is restricted to the Thames Valley region around Reading, but Tele2 UK says it will cover up to 60 percent of the country by 2003.

MD Peter Scrope claims a standard 128Kbps leased line typically costs at least £1,000 a month. "Because we are using a wireless network we don't have the huge overhead of companies like BT... [and] we can pass the savings to our customers."

Charges are based on data quantity rather than time of connection, which is via a cheap ethernet card.

Tele2 0800 328 7222,
www.tele2.co.uk

Giants ally to boost home networks

■ Industry giants are getting together to draw up specifications for linking devices ready for an expected boom in home nets. The new Home Phoneline Networking Alliance includes IBM, 3Com, AMD, AT&T Wireless, Compaq, Hewlett-Packard and Lucent. First products are expected by the end of the year.

The aim is to allow people at home to share internet access, data, printers, digital cameras, storage, and other devices. They could also play each other in networked games.

The alliance is also working with Tut Systems to enable home networks to operate over common telephone wires at 1Mbps, and eventually 10Mbps.
VNU Newswire

Oldest Hayes sought

■ Hayes is looking for Britain's oldest working Hayes modem to mark the twentieth anniversary of the company, which drew up the famous Hayes command set still used by most modems.

The owner will win a free multimedia PC, with an internal V.90 Accura modem. Hayes will donate a similar model to the NSPCC. Ring James Mulhern at Hayes, on 01276 704410, before October 16 if you think you might have a winner.

The network gets a voice (and it talks a lot of money...)

Britain's biggest and best computer show was thick this year with people sniffing fortunes to be made.

Networks 98 showed the comms world going through a shift broader even than that

Clive Akass reports from Networks 98

suggested by the much talked-about convergence with computing. Billions in investment and potential returns ride on the changes.

Prompting the shift is an imminent jump in data transfer speeds, with cable modems, xDSL and satellite broadcasting promising between 1Mbit/sec and 40Mbit/sec (see *PCW*, August).

For big pipes you need big pumps. Increased use of high bandwidths has made painfully obvious the fact that audio modems are not the only bottlenecks on the web. So there is a stress on a new class of server able to deliver data fast, and with it a boom in electronic trade.

A series of takeovers before the show made even

the cable industry, which reacted to the internet boom with all the vitality of a slug on downers, suddenly look sexy. UK cable operators are reduced to three – Cable & Wireless, TeleWest, and NTL – following NTL's £943m purchase of Diamond Cable and Comtel.

NTL has also bought Net Channel UK, which provides a hybrid web-TV service and the set-top box to access it. (Microsoft is in on this act, piloting web-augmented TV programmes with the BBC on its WebTV system.)

Cable modems, either as a PC add-on or within a set-top box, will emerge from this consolidation, if only to compete with satellites.

Cable loops are effectively local networks sharing a 30-40Mbit/sec data path with up to 600 users. Ironically, the more users they get, the harder it will be to compete with the guaranteed 1-4Mbit/sec of BT xDSL phone links.

But these higher higher data rates will facilitate Virtual Private Networks, which simulate a permanent leased line by offering fast secure links over the internet.

Here too there has been consolidation, with telecoms giant Nortel taking over Bay Networks. Analysts expect more deals linking telecoms and networking specialists.

The big news at



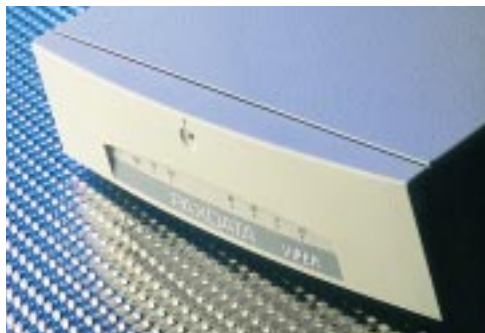
Voiceover IP has come a long way since those first muffled net conversations. ITK's 120-port Netblazer 8500 is a combined voice gateway and remote-access server. Details at www.itk.com

Networks was a merging of voice and data traffic, with the local network replacing traditional analog lines.

This can be cheaper and more efficient: Caller Line Identification (CLI) can be used to trigger contact management systems; and voice mail can be integrated with fax and email.

Computer telephony has become so big, in fact, that it now has its own sub-show at Networks. The talk this year was mostly about Voiceover IP – using Internet Protocol on intranets as a telephony medium. This has been slow to take off on the internet because IP packets are not well equipped for delivering time-dependent voice traffic. But VoIP vendors insist that the problems can be minimised, particularly on intranets.

All of which spells huge changes for BT. If voice can be carried efficiently over a permanent xDSL connection, what is going to happen to its traditional phone revenues?



Paxdata has eschewed VoIP in its new Voice Integrated Packet Exchange Router (Viper) which allows a single ISDN channel to be shared by voice, fax and local network traffic. It incorporates an IP/IPX router but uses Fast Packet technology and ITU-endorsed compression to ensure timely toll-quality speech. MD Jim Fitzpatrick says it lets a user work remotely as if back at base. Calls to the office are redirected to the remote site, from where the remote LAN can be accessed simultaneously on the same line.

Paxdata 01442 236336

Still DiViDed ... Divx throws a spinner into the DVD works

As proper European DVD movies continue to trickle into our stores, the so-called digital versatile disc video format is causing more than a little confusion in the United States.

Fans of high-quality digital surround sound were dismayed to find they would need a new DVD player to hear the far superior DTS soundtrack on forthcoming titles. Current players will play only Dolby Digital or MPEG 5.1 in the cases of some UK titles.

As the latest batch of US DVD players with DTS compatibility are released, yet another "enhancement" could make all current players obsolete. It is called Divx, or Digital Video Express, developed and owned two thirds by the US video rental chain Circuit City.

A Divx movie differs from a conventional DVD one only in having additional encryption. And instead of renting one, you buy it for around \$4.50. This includes a two-day viewing period which starts as soon as or as far in the future as you like; you can buy another two days for around \$3.25, or convert it into a DivxSilver disc for unlimited viewing at around \$15.

The renewing or converting is done by the Divx player itself which calls a toll-free number every month via a built-in modem to update a central charging database. The makers say this offers the ultimate consumer freedom and saves you having to return rented movies with the inevitable late fines. There will also be DivxGold discs, which offer unlimited playing from scratch.

The catch is that you need a Divx-compatible player. The bigger catch is that with the extra encryption and royalties, many movie studios find Divx more tempting than open DVD. There could be a situation where

some movies are released only on Divx, and won't play on hundreds of thousands of existing DVD players. Worse is that, like the current VHS rental model, the first Divx titles will be non-widescreen, with no extras, until consumers say differently.

Digital Video Express is reportedly talking of a European launch in 1999. Its current encryption algorithms cannot be used outside the US, so a different system will be needed here. This will make the unofficial tweaking of players to handle titles from non-home regions virtually impossible. Hollywood is happy but the consumers are still confused, and increasingly wary of investing in DVD when the format continues to be "enhanced" at such a pace. **Gordon Laing** (who still hasn't bought a DVD player from the US or otherwise – see PCW August) [Digital Video Express www.divx.com](http://www.divx.com)

Maths pack weds CAD

Computer-Aided Design packages have long gone far beyond being simply computerised drawing boards.

One obvious advantage they have over drawing is that you can change the size of an object simply by changing a few parameters, enabling you to automate the adaption of standard designs to differing requirements.

Some parameters may be the result of calculations, so that CAD packages begin to sprout facilities for accepting parameters passed on by other programs.

Frequently found on each side of

this process are Intergraph's Imagineer engineering design package, and Mathcad which, as its name implies, is used for design calculations. Now a new patch is available to enable Mathcad 7 and Imagineer 2 to co-operate using Microsoft's OLE automation.

The new patch will for instance allow Matchcad to check if an Imagineer drawing fits a certain spec. Conversely, Mathcad might calculate parameters needed to fit a specification and then feed them to Imagineer. The new patch can be downloaded from www.adeptsience.co.uk



Short stories



Many graphics packages have yet to adjust to the needs of the web, when picture quality has to be balanced against download times. Canadian start-up Hemera Technologies, co-founded by ex-Corel executive Marc-Antoine Benglia, has launched NetGraphics Studio2, which it says fills the gap.

The £59.95 pack (inc VAT) converts and optimises image files into GIFs and JPEGs for web use. It includes 2,000 royalty-free Photo Objects (photo cutouts used like clipart) and a module for creating textured fonts.

A separate Photo Objects Premium collection of 10,000 images costs £49.9 inc VAT.

Details on 01703 814142

Tiny is enormous

Tiny Computers claims to be Britain's biggest PC manufacturer after shipping 63,999 PCs in the first three months of this year – double the figure for the same period last year. The figures include sales by Opus Technology, which has now been rebranded Tiny Business and Professional division.

Tiny 01293 821555, www.tinycomp.co.uk

Disk cloners

Quarterdeck has launched a software package to help mirror hard disks to larger-capacity upgrade drives. DiskClone comes in a £30 Regular and £40 Extra strength version respectively for single users and IT managers.

Quarterdeck 01628 666322

Easier CD Creator

Adaptec has launched a major upgrade to its CD creation pack. Easy CD Creator Deluxe 3.5 adds special effects to its music compilation facilities, and the ability to create digital photo albums. It costs £69. Version 3.0 users can download a free upgrade from www.adaptec.com.

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'Open' Studio 6 favours NT

Microsoft will ship its Visual Studio 6.0 development suite in early September. The bundle includes a revamped Visual Basic 6.0, which also ships as a standalone at the same time.

The suite boasts many features to allow integration with non-Microsoft platforms, particularly databases – including Oracle, Informix and Sybase.

It also focuses on web facilities as a way of getting disparate platforms to work together on a company net.

Visual Basic is seen as a rapid development tool, with Visual C++ patches being used

wherever speed is critical. A new VB WebClass Designer is aimed at making web pages for viewing in any browser. You create HTML within any editor and use VB to attach data-access functions and other logic. This is not truly cross-platform as the VB code has to run on a Microsoft IIS server. And the whole suite uses Microsoft's own Distributed Component Object Model (DCOM) for transactions with a server. So the suite steers developers towards NT.

The popular rival

Delphi 4 suite from Inprise (formerly Borland) supports the platform-neutral Common Object Request Broker Architecture (CORBA). But VB is far the most used and version 6.0 betas have been well received.

● Contemporary Software says it will sell component objects implementing VB 6.0's extended database support. **Clive Akass**
Microsoft 0345 002000; Contemporary Software 01344 873434

England's saving graces

Here's a screensaver to meditate upon if you're tired of all those movies about the evil sassenach clobbering killed innocents in their northern highland paradise. This is, of course, Hadrian's Wall. Built the best part of two millennia ago, and one of the earliest of many measures to discourage northerners from pillaging England. It's one of 24 images of English Heritage sites in a £12 floppy gift pack. Details on 01604 781163



Subscriber draw

Over the past few months we have asked a selected number of subscribers what their favourite editorial part of *Personal Computer World* is. This is what you told us:

42% Reviews/First Impressions
37% Hands on
21% Newsprint and analysis

Thank you to everyone who took part. We are pleased to announce the four lucky winners of the PCW Laptop bags in the PCW Subscriber Survey as: RC Braddick, Worcester; Mr GL Stevens, Norfolk; Mr Richard Attenborough, Merseyside; and Mr C Evans, Norwich.

Well done everyone, and your *Personal Computer World* Laptop bags are on their way to you.

If you are a subscriber to *Personal Computer World*, you will be selected at least once during the lifetime of your subscription to take part in the survey.

No purchase necessary. For a chance to win, send your name and address to PCW Subscribers Survey, 32-34 Broadwick Street, London W1A 2HG. One entry per household. No cash alternatives. Winners will be notified within 14 days of completion of draw. A list will be printed in *Personal Computer World*. Prize draws will take place in September 1998, December 1998 and March 1999. Entrants will be entered in one draw only.

Meanwhile, back at the Netscape camp, the NetCenter portal is opening...

Before Netscape's annual strategy briefing, I had dinner with its CEO, Jim Barksdale. I expected conversation to centre on the Microsoft anti-trust case (page 24). Instead, the discussion was steered to broader issues.

Netscape is betting its future on three strategic planks:

● More internet-based infrastructure products, like network and commerce servers and directory services. Microsoft is gaining ground with its NT server architecture, but Netscape is still winning big accounts with tools that work on top of NT.

● A belief that we are at the flashpoint of the "net economy". Barksdale foresees a move from solid to virtual assets where commerce of all types revolves

around the network. Netscape plans to become what he calls an enterprise service provider (ESP) offering end-to-end e-commerce solutions.

● The NetCenter. This is a net "portal", offering information and services in a bid to become a first port of call. Netscape has opened a new beta portal at home.netscape.com/index.html.

NetCenter general manager Mike Homer, who was also at the dinner, said Netscape hopes its revenues will make up for those lost from giving its Navigator browser away. NetCenter took \$30 million in advertising revenue last quarter and has booked more than \$100 million in ads for the rest of the year.

Clearly, Netscape is trying

with NetCenter to beat Microsoft at its own game. Microsoft is integrating the browser into the OS; Netscape is integrating the browser into the internet.

This is an important concept that could pay off big time if applications start being deployed over the internet instead of at local level. Add the capabilities of dynamic HTML and XML, and Java applications, and the idea of using the browser as a graphical user interface makes sense.

Of course, Microsoft is not sitting still. Its commerce servers are gaining serious attention and its browser has the edge in the Wintel world while it is bundled

Tim Bajarin reports from the US



in the OS. And Microsoft has its own portal plans.

But as Netscape can no longer make money on its browser, it has taken the new direction. It will need to execute the plan well, and gain some kind of momentum on sales. If it fails, its market position will shrink.

Cambridge Animation Systems launched at the Siggraph show in Orlando last month the NT version of its Animo package which is virtually a standard for 2D cartoon animation.

Animo was used in *The Prince of Egypt*, the first animated feature from Stephen Spielberg's new DreamWorks animation campus. It was also used in the Warner Bros productions *Space Jam* and *The Magic Sword - Quest for Camelot* (pictured, below right)

Animo replaces repetitive animation tasks and is used by 200 studios worldwide. It uses cells on which elements such as characters and backgrounds are painted.

Original drawings are scanned into a desktop computer on which the director can specify colours. Batches of cells can be despatched electronically to be "painted" while keeping their hand-drawn appearance.

Ruth McCall, MD and joint founder of CAS, makes the point: "Painting did not die out just because sculpture was invented." Earlier this year CAS won a Queen's Award for export achievement.

Originally created in 1992 to run on PCs, Animo was enhanced for use on Silicon Graphics workstations. Designed for professional animators rather than computer buffs, Animo transfers traditional craft skills to the digital domain, increasing output and halving costs.

Brian Tyler, Cambridge

Brush up your animation with Animo Ax-Cel for NT

Caroline Swift continues her reports from Silicon Fen



Animation's director of sales, says the new NT-based Animo Ax-Cel allows collaborative 2D animation work across the major computing platforms.

"Animators want to draw simple ideas on paper and get

members of the Cambridge Network, likened current perceptions of the net to entering a dark room with a flashlight, only able to see a few patches and not able to make out the room's shape.



"The Magic Sword - Quest for Camelot" © Warner Bros. Feature Animation

action and movement, then get computers to scan this in. We build on what animators do, and capture characters' expressions. There has been a big push from the 3D world, but traditional storytellers don't want it."

Says Tyler: "We have bolted the digital back-end on to the craft process." www.animo.com

• Futurologist Esther Dyson, talking to the 170 or so

Named as one of Silicon Valley's 100 most influential people, she visualises a web on which you will visit whole neighbourhoods instead of individual addresses. "What the web needs now is new mapping tools," she said.

"In perhaps four to six years there will be one billion people connected to the internet and some five billion devices connected – the world will be

informationally active. And by then, in our everyday lives, we will be able to track down electronically a blazer we put down somewhere; find out where a packet has got to that was mailed yesterday or where the bus has got to on its route to your stop."

• Cambridge start-up TCS Internet has launched an online IT recruitment service. So what's new, you ask? What is different, says director James Barrell, who developed the site on Lotus Notes, is that it allows a company to approach the candidate directly.

The company pays a fee at the start of any contract; the candidate pays nothing but publishes a personal profile on the site. TCS has a database of several thousand IT professionals, neatly categorised.

"It makes the candidates' information easy for companies to access," says Barrell. "They can log in to a database and search for what they need, such as someone skilled in Lotus Notes or Windows NT. Or they can search for someone available, next week, to build their intranet." www.jobclub.com

Compaq to sell Alphastations

Compaq is to sell NT workstations based on Alpha processors in the wake of its takeover of Digital, which has got the regulatory go-ahead.

Digital workstation product manager Robin Shuff said Compaq-badged Alpha machines will ship by autumn.

Sales may be helped by the fact that Intel's first 64-bit processor, Merced, has

been delayed until at least late 1999.

This leaves a clear field for Alpha to use 64-bit addressing in NT 5.0 – though the new operating system has also been delayed.

Shuff said: "We can offer a uniquely 64-bit platform as soon as NT 5.0 comes along. You don't have to wait for Merced." Hugh

Jenkins, head of corporate enterprise computing at Compaq UK, said that the company will also offer workstations running Intel's new Xeon processor.

"At the high end we will offer the XP range, which will run either 64-bit NT or Unix on the Alpha platform."

Mike Magee

Compaq 0181 332 3409

K6-2 gets more backing

AMD has scored another win against Intel for its K6-2 processor. Hewlett-Packard said it will use 300MHz and 333MHz versions of the 3D chip in two of its Pavilion consumer PCs. Last month, IBM said it would use the K6-2 in some of its Aptivas.

Rob Herb, senior vice president of marketing at AMD UK, hailed the HP move as a breakthrough.

He claimed that HP had adopted the processors because they were an "ideal choice" for home customers.

But HP has a dual approach. It also announced four other Pavilion PCs using Intel's PII technology.

Mike Magee

Superslim notebooks

Thinner and lighter notebooks were the trend at PC Expo. Sony and Sharp both introduced fully-featured, Tillamook-powered systems that break the 1in barrier.

Sony unveiled the Vaio 505GX Superslim weighing under 3lbs but sporting a 200MHz or 266MHz MMX, 32Mb RAM and a 2.1Gb hard drive. The systems will go on sale this autumn for around £2,500 (ex VAT).

In the UK, Sony also announced Club VAIO, a service and support product that will give VAIO Note owners an extra two years' guarantee in addition to the standard one-year agreement.

Members also get access to a dedicated



VAIO 505GX: light to hold, heavy on the wallet

web site with technical support FAQs, self-diagnosis utilities, an online shop for VAIO accessories, tutorials and user manuals.

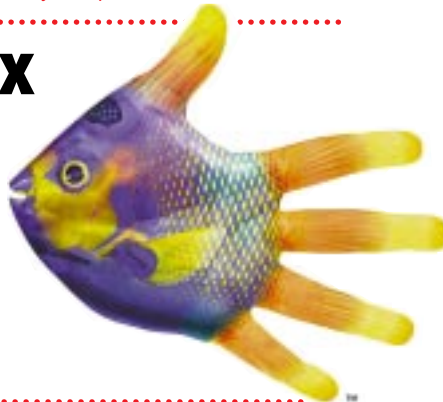
Sony 0990 424 424, www.sony-cp.com
www.vaio.sony-europe.com

A handy web index

■ **Enfish Tracker Pro**, scheduled to ship this month, creates a full text index of email messages, local files and bookmarked web pages. The software analyses these documents and groups together related files by topic, allowing you to search them. **Enfish Tracker Pro** will be sold online in Europe for US\$79.95.

www.enfish.com

VNU Newswire



Office 97 successor: it's official

■ The successor to Office 97 has been officially renamed Office 2000 and is expected to ship in late 1998 or early 1999.

It will support HTML as a document format on almost equal footing with its own file formats like .DOC and .XLS. Documents can be opened from, and saved to, a web server as they would to a local disk, using the web server as a collaboration tool.

As well as documents, Office 2000 users will be able to save interactive content to the web: an Excel table, say, that allows web users to edit data in their browser and immediately calculate the result.

However, Office's heavy internet slant should not be confused with a conversion to open standards, nor a move away from proprietary technology. Most of the group collaboration features require Internet Information Server (running on Windows NT Server) at the back end. And the XML (eXtensible Markup Language) tags that Microsoft has added to HTML to map all

Office document formatting features, will mean that the documents created in Office may look

radically different when viewed on a Netscape browser, say. This means that many new features in Office 2000 may only benefit "Microsoft-only" shops.

Other features include flexible installation options, self-repairing installation, a clipboard-like utility and enhancements to the Office Assistant (the talking paperclip, pictured above) which will freely roam the screen.

A feature that will not be included in beta 1 of Office 2000 and thus unlikely to make it into the final product, is speech technology.



The talking paperclip will roam all over your screen in Office 2000

Short stories

Corel gets personal

■ Corel has added a set of personal information utilities, integrated with Netscape Communicator, to WordPerfect 8.

Corel Central includes email, an address book and card file, discussion-group threads, and telephone and whiteboard conferencing. WordPerfect 8 users can get hold of a free upgrade.

Corel 0800 581028
www.corel.ca

Giving good voice

■ IBM and Dragon Systems have both released updates of their speech recognition products, Via Voice 98 and Naturally Speaking 3.0 respectively.

Philips also entered the market with Freespeech 98, priced at \$39 below the competition's entry-level products. The product will ship in the UK later this year and is also integrated with the Philips Speechmike, a \$74.95 microphone, trackball and speaker.

Philips www.philips.com
IBM www.ibm.com
Dragon www.dragonsys.com

SME net files service

■ Compaq has rolled out a set of internet-based services aimed at small to medium-sized enterprises (SME).

Compaq Online Services promise instant and secure delivery of business files over the internet, secure remote access to files as well as remote backup over the internet. The service will be available in Europe by the end of the year.

Compaq www.compaq.com

Easy stationery for small businesses

■ Corel has introduced a new publishing package aimed at SME users.

Corel Print Office uses ready-made templates to create business cards, letterheads, envelopes, brochures and newsletters. All documents can be output as HTML. Print Office will be available here in the UK later this autumn.

Corel 0800 581028
www.corel.ca

VNU Newswire

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Short stories



■ According to Canon, an organiser is no longer just an *organiser*. It's the "ultimate lifestyle product for the fashion-conscious executive of today".

Granted, the slimline ZX10 does look quite good, and its functions (address book, scheduler, to-do list, memopad, spreadsheet and calculator) are nothing to be sneered at. The price (£149 ex VAT) is right, too.

Canon 0181 773 6000, www.canon.co.uk

■ Looking for a poster of your favourite British historical figure or present-day hero? The National Portrait Gallery's Portrait Printer uses a 16.7m colour FujiFilm photographic printer and a database of over 7,500 images from the gallery's collection to produce your selected image, like this 1918 portrait of Vanessa Bell.

Prices start at £5.50 for a 6 x 10in poster, rising to £17.50 (12.4 x 18.3in). Customers who can't make it to the gallery can order by post, phone or email.

National Portrait Gallery: www.npg.org.uk (orders 0171 306 0055 ext 253, or email pgrand@npg.org.uk)



■ Take the strain out of minute-taking with a copy of Minute Maker for Windows CE at £39.99 (ex VAT). Minute Maker helps automate note taking by letting users insert text into pre-installed or user-defined templates. It can even remind you of missed discussion topics during a meeting.

Smart Ideas Software 01242 244700, www.smartidz.com

Retail customers paying too much, claims Fujitsu

A claim that UK shops are keeping the price of PCs artificially high is being investigated by the Consumer Affairs Minister. The claim, by Fujitsu, came in the same week that a survey from analysts INTECO found that the average package price paid by French and German home PC buyers was significantly less than that paid in Britain.

A spokeswoman for Fujitsu said that company representatives had met Nigel Griffiths MP for a briefing on the UK situation, and that the meeting had been "very successful". Fujitsu made the complaint after its plan to sell its PCs at a European pricing level through Tesco and Asda was quashed by the supermarkets.

Peter Day, who manages the consumer PC tracking service for INTECO, said: "It appears that pricing across the board in the UK is higher than in France and Germany. The specs are also higher, but it doesn't seem to merit the difference in price." He pointed out, however, that it was not just the consumer electronics retail chains that were marking-up prices: "If you look at the dealer or direct channels, the average spend is higher in each case, as well."

Hamish Haynes, Compaq's consumer business unit manager, said: "You can't just stick a PC on the end of an aisle with a cheap price tag and expect it to sell." But



■ The Panasonic LF-1097 combines high-speed optical storage with a 24-speed CD-ROM drive, freeing users from the hassle of maintaining multiple drives. The SCSI-2 compatible device uses 650Mb "PD" optical media that costs less than £20 per disk — as low as 3p per megabyte. It is also read/write compatible with Panasonic's DVD-RAM drives. The LF-1097 retails for approximately £269 (ex VAT).

Panasonic 0800 444220, www.panasonic.co.uk

Day does not think this is necessarily true. "In France, 40 percent of sales go through this market, whereas in the UK it's more like 20 percent," he said. He thinks that as long as retailers sell PCs properly and provide proper service, more people could be encouraged to buy through these channels.

Susan Pederson
(and Steven Palmer, PC Dealer)

Economist predicts millennium bug may cause 'global recession'

■ The chief economist of Europe's largest bank says that there is a 70 percent probability of the millennium bug causing a global recession as bad as, or worse than, the 1973 oil crisis. Dr Ed Yardeni, of Deutsche Bank, said the response of world leaders at May's G8 summit in Birmingham was "pathetic".

■ Home and small-office users can check their PCs for potential Y2K compliance issues with Network Associates' 2000 ToolBox. The product automatically conducts a complete audit of hardware, software applications and files, giving users an overview of the problems and how to fix them. 2000 ToolBox costs £19.95 (ex VAT). Network Associates 01753 827 500, www.nai.com

He went further and suggested that the world could be brought to the brink of nuclear war by failures in IT defence systems. He quoted evidence given by the US deputy defence secretary William Cohen, to the US Senate Armed Forces Committee last month. In his evidence, Cohen said that the US is prepared to pool information with the Russians and the Chinese to help avoid a "blank screen" scenario on 1st January, 2000.

Colin Barker, VNU Newswire

Internet shorts

**Savings/bank account net link**

Norwich and Peterborough Building Society (N&P) is offering the first internet banking account to be linked to a savings account.

The NetMaster service, which offers 7.5 percent p.a. interest, is available to anyone who opens, or already has, an N&P personal or business banking account.

N&P 0800 83 322, www.npbs.co.uk

Free net guide for the blind

Blind and partially-sighted people who want advice on getting the most out of the net can get a free guide from the RNIB.

The guide is available on disk or tape, and in Braille or large print. It shows how to get connected and avoid pitfalls. For your copy, telephone:

RNIB High Tech Support Team 0345 023153

BT offers 'pay as you go' net access

British Telecom plans to launch a revolutionary internet service this month that will let people get online without having to use a service provider. The pay-as-you-go service, BTclick, which has been available as a trial in Northern Ireland, will give BT customers access to the internet for as little as 1p per minute on top of their local call charges.

BTclick eliminates the need for registration, fixed contracts and monthly subscription fees. Users will be able to register for free email, including the planned BT Mail service. BT does not expect the service to be a serious rival to its traditional ISP business but thinks that many people will appreciate a simple net gateway option. "It's just an alternative route," said a spokesman. "But you won't get the same email or web-space services, and it won't hold your hand."

Robin Duke-Woolley, a consultant with analyst group Schema, says that the

service is likely to encourage those who couldn't afford internet access to get online. "This is a good thing," he says. "But there's the possibility that BT may be putting itself in too favourable a position. Other operators may find it difficult to offer it at the same price and still make a profit." He also thinks that a way should be found for ISPs to also offer the same service.

BT claims that its 1p per minute charge will adequately cover the service's expenses, and denied that it was being anti-competitive. "We're not monopolising our position, because everyone could do it. We just happen to have got there first," a spokesman said.

Oftel stated that it had no objections thus far, but that it would be keeping an eye on the service as it developed. It also said that it hadn't heard of any other telecoms operators planning a similar service.

Susan Pederson

SME net starter packs

■ Cable & Wireless and Mitsubishi are wooing small and medium enterprises (SME) with a selection of services designed to help get them online.

Cable & Wireless is offering CWIC Link, an off-the-shelf package for ISDN connection that includes an ISDN LAN modem from 3Com and dialup internet access. CWIC Link can easily be installed in 15 minutes by a non-technical user who simply plugs in the ISDN connection, power lead and PC links to the back of the OfficeConnect to create an instant LAN. To connect four PCs costs £295 for the modem and £295 per year. To connect ten PCs costs £364 for the modem and expansion hub, as well as £500 per year (prices ex VAT).

Mitsubishi has also jumped into the SME ring with a raft of internet services to help those starting out, beginning with the Internet Starter pack which costs £9.75 (ex VAT) per month and includes access and web space, as well as SafetyNet90, a quibble-free money-back guarantee. At the high end of the market, Mitsubishi is offering Internet Server hosting for £695 (ex VAT) per month.

Cable & Wireless 0800 056 2826 www.we-mean-business.co.uk Mitsubishi 0800 226 600 www.menet.net

MS forks out

■ Microsoft has been forced to pay out US\$5m to a defunct internet service provider (ISP) in order to secure the rights to the name "Internet Explorer". Synet, whose founder claims he first used the name in 1994, had already registered the trademark with the US Patent and Trademark Office. Microsoft had also faced civil charges alleging that it had stolen the name for its own use.

Microsoft had tried to claim that Internet Explorer was just a phrase to describe its product and that it could not, therefore, be trademarked. The jury disagreed, however, awarding the decision to Synet. The ISP's founder, Dhiren Rana, said that his company had gone under because of the expense of trying to protect itself from Microsoft and that the settlement would be entirely swallowed up by creditors' bills and lawyers' fees.

"Microsoft cannot make everything its own, so I fought it on principle. I have the satisfaction of knowing that the little guy took on, and stood firm against, Microsoft," he said. Microsoft saved an estimated \$25m on the deal by not having to remove the word from its products.

Susan Pederson
(additional reporting by
VNU Newswire)



Floppy risk

The LS-120 is slower than the Zip but looks increasingly good as a replacement for the floppy — if, indeed, a replacement is needed. Clive Akass reports.

There seems to have been a shift in the “superfloppy” battle between vendors seeking to launch a successor to the ubiquitous floppy drive. With 90 million new PCs being sold each year, the winner or winners stand to gain a multi-billion-dollar market for drives and disks.

An early leader was Iomega, which was the first to see the market and fed it successfully with the Zip drive, taking 100Mb removable cartridges. There was nothing like it available at the price and the Zip quickly became standard in graphics houses for exchanging large files.

However, the Zip suffers a huge disadvantage as a

twice the current 120Mb capacity could be available as soon as next year. He doubts if the Sony drive will appear before 2000. “It was a pre-announcement, designed to hold us back,” he claims. “I have yet to hear of anyone who has seen it working, at least with a capacity of more than 40Mb.”

Iomega has showed signs of losing its way, with costly law suits, losses, layoffs, and greater competition for its 1Gb and 2Gb Jaz removable drives — beaten last month by Syquest’s SparQ in our group test.

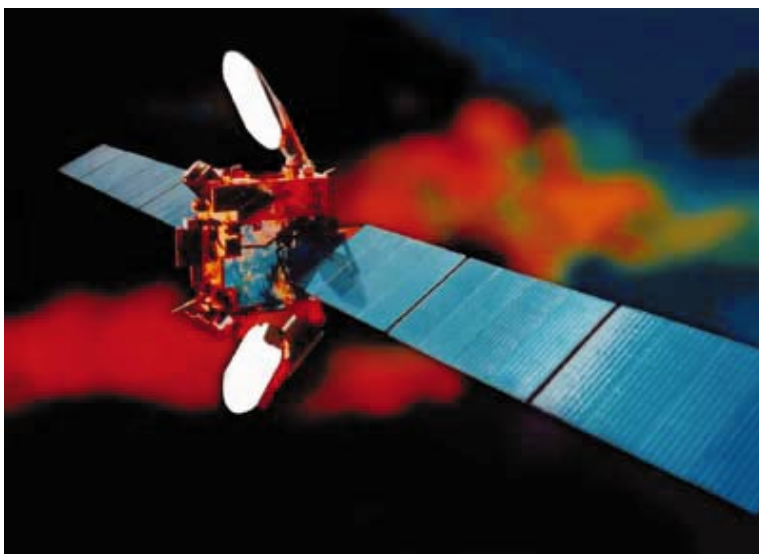
It scored a major win when Compaq announced it would fit the Zip as standard on many of its Presario consumer models. But Compaq is also to fit a SuperDisk drive on one of its Armada range, probably because it is thinner: the Zip cannot be reduced to the depth of the new slimline notebooks. In any case, a combo drive makes more sense for portables where weight is so important.

The SuperDisk drive also increasingly makes sense for new desktop PCs because, unlike the Zip drive, it eliminates the cost of a standard floppy. Heap says it adds only about £27.50 to the cost of a PC, and prices are still falling.

He does not see the Zip’s greater installed base as a problem. “We are targeting the corporate market where the Zip does not have such a strong hold.” Imation is tempting security-conscious corporates by offering 120Mb disks with built-in encryption. And a USB SuperDisk drive specially designed for Apple’s new iMAC, which lacks a floppy, will ship later this year.

The Zip is still popular, but costs and convenience are with the SuperDisk. A big unknown is the effect of the comms revolution. Data rates will increase at least tenfold over the next two to five years, by which time most PCs will be plugged into the internet.

Most floppies are used as a transfer medium, either for commercial software or to move files between PCs. When you can transmit 1.44Mb in less time than you can write it to disk, who will need floppies?



Satellite and other fast delivery paths could see off the floppy disk

superfloppy in that it does not read standard floppies. Iomega at one point actually owned a technology that could cope with both standard and new 120Mb disks, but sold it to finance development of less technically challenging Zip. That decision could return to haunt it.

The technology was bought by OR Technology and licensed by storage-media giant Imation and various drive makers. The drives, adopted among others by Compaq, have been called both the a:drive and the LS-120; now the favoured name is SuperDisk. They are some 30 percent slower than the Zip, but speed is not such a big factor for a disk intended mainly for backing up, archiving, or exchanging files.

Sony showed a rival superfloppy taking 200Mb disks at Comdex last year but no performance figures are available. And Marcus Heap, European business manager of Imation, says SuperDisk drives with at least

Thanks to all of you who replied to my article (*PCW June*) about interrupted downloads. Many of you recommended a program called GetRight, which we consequently include among our top Utilities (see *page 200*). It’s important to complain when you find sites not supporting “download resume”. It’s the only way to get things changed.

Minister denies a move to censor net

The DTI is strenuously denying a report that it plans to set up an independent panel to investigate complaints about internet content. The allegation, in *The Independent* newspaper, said Minister Barbara Roche was considering extending the brief of the Internet Watch Foundation (IWF), which currently deals with child pornography, to take in civil disputes such as defamation and copyright violation.

DTI spokeswoman Kate Bandenbrook said: "That story is largely fiction. The government was reviewing the role of the IWF in conjunction with internet service providers earlier this year but it has no plans for any other kind of body." She said that it would be up to ISPs to tell the DTI whether or not they would want such a thing. The results of the review will be available this autumn.

John Wadham, director of civil liberties pressure group Liberty, said that such a move would be a big mistake. "A panel of the self-appointed great and good to censor material on the internet cannot be part of a modern democracy. This would be disputed in the courts, as well as on the basis of the right to freedom of expression from the European Convention on Human Rights."



Days earlier, former Prime Minister Margaret Thatcher called for governments to regulate internet content at the World Congress on Information Technology. She said, "The same highways on to which you put good information and messages can be used for the purposes of criminality and obscenity." She admitted that although "there are things that you and I would call immoral...there is insufficient ground for us to make them illegal as that would be a constraint on freedom."

The US government is currently examining a bill that would cut off funds to schools and libraries that refuse to use filtering software for the internet.

Susan Pederson

(additional reporting by VNU Newswire)

- Human rights groups have condemned a 10-month suspended jail sentence handed down to a Turkish teenager who criticised the police in an internet chat group. Emre Ersoz was charged with "publicly insulting state security forces", having denounced rough police treatment of a group of blind people protesting about potholes in Ankara pavements.

Internet shorts

News on the scene

If you need to find out what's happening fast, head over to www.newsnow.co.uk. Described as the UK's first news aggregation site, the site grabs headlines from over 30 daily news sources and provides a link to the host site. NewsNow covers a wide range of subjects, including business, technology, entertainment and sports, as well as general news headlines.



Access on the street

The Post Office is set to offer a smartcard initiative that will let small businesses access government services via electronic kiosks and PCs in post offices, council offices, libraries and business advice centres. The trial, which will run for a year, will offer electronic application forms, advice and support.

Look before you leap

A UK-specific search engine has enhanced its service with a utility that provides users with more information about a site before they visit it. The searchUK Explorer icon gives users a map of all the pages on a site, and also ensures speedier download times.

searchUK www.searchuk.com

Looking good on the internet

■ High-street fashion chains are starting to attract internet users with a range of online shopping sites.

The Arcadia Group, which manages shops such as Dorothy Perkins, Debenhams, Racing Green and Principles, has recently completed a successful six-month trial, while The Gap plans to launch a worldwide shopping service next year.

The limits of power

Do you really need the power of the latest superfast processors? Yes, says Tim Bjarin. With a little help from Intel, he comes up with two good reasons to buy.

Processing power has grown dramatically over the past three years, but software applications have not kept pace. A big question for corporate users is why they need to buy a 400MHz PC when they can take full advantage of current applications with existing PCs. Indeed, many are looking in the opposite direction and are investigating how sub-\$1,000 PCs will fit into their internet and server-based strategies.

Discussing this with Intel officials, I was fascinated to find that while they concede software will probably never keep up with processor speeds, they now have a plan to make people go out and upgrade. Intel is about to launch an aggressive campaign touting what it calls continuous computing. The idea is that we now have so much processing power at our fingertips, that we can run multiple applications and/or web-based screens

simultaneously, thus increasing productivity.

A good operating system ought to support multi-processors, multitasking and multithreading: in other words, it should deliver continuous computing. But Windows applications of today are rooted in 16-bit DOS,

severely limiting the scope for running multiple applications simultaneously. Intel wants you to believe that if you use enough processing power and memory, you can compensate for the weaknesses of Windows. This is an important idea that has merit.

We will not have a mainstream Intel-based operating system for continuous computing until Windows NT 6.0 débuts some time in 2000 and gets rid of the DOS connections. But this would be bad news for Intel and today's aggressive processor development.

Ironically, there is an Intel-based OS that not only delivers true multitasking and multithreaded capabilities,

but also delivers on dual-to-quad processor support. This is the BeOS that Intel has some interest in; unfortunately, it is aimed at multimedia developers and has no chance of displacing Windows at any level.

So continuous computing is about to be born. But I suggest that there is a more compelling reason to buy the fastest PC you can afford. With the advent of CD read/write, and with DVD read/write on the horizon, we are on the verge of using PCs in a new form of communication. We can include only text and graphics in a desktop-published document and we have to send it by fax or snail-mail or, more recently, over the internet. The net allows you to add simple animation, and soon, VRML-based animated objects.

But the restrictions on bandwidth for sending large bits of data will be with us for a long time. This means that sending "rich documents" including full-motion video over the internet is not going to happen soon.

I believe we will start using optical read/write medium in a hybrid form to create and send "rich documents" in the near future. You could use a multimedia PC, with powerful processing, to create a multimedia document recorded on the optical read/write medium.

It would allow you to personalise a rich marketing document for individual customers. Or a valued client might be treated to a personal video greeting from your company president. You can then display your products in living colour and full-motion video. You could even create a 3D version for viewing from any possible angle.

You could allow the customer to log on to your web site and get updated information as well as new data to trigger other 3D images you have stored on the promotional CD or DVD. You would need a powerful PC to create this document — and you would need a powerful one to read it as well. This is especially true if the CD or DVD includes video or serious 3D animations.

Sub-\$1,000 PCs can read today's CD-ROM and tomorrow's DVD-ROM but they lack the power to handle the "rich media" content that will drive the communication PCs of the future. So, both continuous computing and powerful MM communications bode well for Intel. Even though the sub-\$1,000 PC market is hot, these two extended uses of a PC could eventually drive users to more powerful processing capabilities even if Microsoft is slow to give us an OS that really takes advantage of the processing power Intel continues to deliver. ■



Intel's new 400MHz Xeon will find a ready market for servers and high-end workstations, but is overkill for routine desktop applications

Chipsets with everything

Video cards based on the Voodoo2 3D chipset have been ruling the gaming roost. But a host of better cards will be launched this summer, reports Ajith Ram.

The PC games boom has produced a demand for cheap and powerful video cards. Further impetus has come from developments such as Intel's AGP (Accelerated Graphics Port, which gives graphics subsystems direct access to main memory) and the impending convergence of computing and TV broadcasting. The result is that a flurry of new designs is about to hit the market.

3Dfx's Voodoo2 3D chipset is current flavour of the month, but you may be advised to wait before buying one. Top vendors like Matrox, STB and S3 are about to launch sub-£200 combined 2D/3D cards that are likely to outperform it.

Matrox was once a market leader. Its early video cards based on the G100 chipset were great for 2D but fell below the 3D standard set by competing chipsets like ATI's Rage Pro and nVidia's Riva 128. Now the company hopes to woo users with its redesigned MGA G200 chipset, which boasts unprecedented features like hardware-based trilinear filtering.

nVidia's Riva TNT, successor to the popular Riva 128, is perhaps the most promising chipset scheduled to hit the market. Almost completely redesigned and a true second-generation 3D chip, the TNT will be used on a host of hybrid 2D/3D cards. Supporting Microsoft's DirectX 6.0 and PC98 specification, the Riva TNT

is also capable of DVD-quality video playback.

S3 has been trailing in the market, but its forthcoming Savage chipset promises 3D performance and stiff competition to the Matrox and nVidia chipsets.

One of the most anticipated chipsets, the PVRSG (Power VR Second Generation), is a joint venture between Videologic and NEC. The PVRSG is something of an oddity, as it utilises a technology called infinite planes to reproduce images. The first-generation version produced better images than ordinary pixel-based rendering, but failed to gain the expected popularity because it was hard to program. PVRSG has full DirectX 6.0 support and is to be incorporated into Sega's new Dreamcast console and arcade machines.

3Dfx is expected to bring out a Voodoo 3 chipset next year. But last month, hoping to build on the success of its Voodoo 3D accelerators, it launched a combined 2D/3D chipset called Banshee which is AGP compliant and supports the DirectX, OpenGL and 3Dfx proprietary Glide programming interfaces.

3Dfx claims it offers the fastest 2D performance in the world and Voodoo2-level 3D performance. The Banshee board, unlike its costlier predecessors, is expected to sell for around the same price as other graphics boards.

Fujitsu is entering the market with the Pinolite, described as the world's first dedicated geometry processor, which could become a welcome addition to the new chipsets. Until now, 3D chipsets like the Riva 128 relied on the computer's main processor to calculate the location of an object on a particular axis. This meant that the performance varied widely between different systems. Incorporated into a dedicated 3D card, Pinolite has the potential to offer unprecedented performance in games and CAD applications.

Developments in the graphics-chip market are being propelled not just by the new 3D chipsets. Many graphics cards are being supplied with drivers which are optimised for AMD's K6-2 processor, which has 21 new instructions to aid 3D rendering. Intel will enter the fray later next year with its Katmai 3D instruction set.

One negative impact of this 3D graphics revolution will be fierce competition. Although this would mean lower prices for the customers, some observers have voiced the concern that many small manufacturers could be squeezed out of business. With industry giants such as Intel entering the 3D graphics arena, this possibility has become very real. But for the immediate future, the customer is king. ■

Savage counter-attack ... S3 hopes its latest chipset will put it back among the market leaders



Internet 'soft' goods will stay duty free for one more year

The world's leading trading nations have agreed to keep software and other intangible goods delivered over the internet duty free for at least another year.

Meeting in Geneva, ministers from the 132 members of the World Trade Organisation (WTO) made the decision despite opposition from emerging nations.

The US House of Representatives later passed a bill forbidding states and local governments from imposing taxes on internet access for three years, also forbidding states from levying a sales tax on internet commerce.

Jim Dixon, President of EuroISPA, the association representing ISPs in six European countries, welcomed the decision. But he said that it would be only a matter of time before governments introduced tariffs on electronic trade.

Bill Clinton called for delegates to join the US in declaring cross-border electronic trade a tariff-free zone. "We cannot allow discriminatory barriers to stunt the development of the most promising new economic opportunity in decades," he said.

Though Tony Blair and European Union delegates backed the decision, emerging

market economies — including Pakistan, India, Venezuela, Mexico and Cuba — expressed reservations.

The agreement was a partial climbdown for the US which has by far the biggest share of the e-commerce market, and has pushed for the tariff ban to be made permanent. The deal prevents governments from imposing taxes on intangible goods (e.g. software) that are traded over the internet but does not cover "hard" goods, or those bought over the net but delivered by more traditional means like mail order.

Simon Robinson, VNU Newswire

Yell Top Ten web sites



It never rains but it pours... as they say at Wimbledon. PR party invitations for the football, the races and the tennis flew fast and furious throughout the summer, leaving most of the PCW editorial staff a little the worse for wear. "Gimme a Pro Plus," begged weary colleague Paul Trueman as he crawled under his desk, having braved five such events in as many days.

If your own social calendar's a bit of a wasteland, never mind, try the listings at www.proplus.co.uk, www.itsascream.co.uk or www.clubon-line.co.uk. But please do try to keep the noise down — some of us are trying to sleep.

- | | |
|------------------------------------|---|
| 1. The British Library | http://minos.bl.uk |
| 2. ClubNet | www.clubon-line.co.uk |
| 3. The Guardian Pass Notes | http://passnotes.guardian.co.uk |
| 4. Habitat | www.habitat.co.uk |
| 5. Happy Birthday NHS | www.nhs50.nhs.uk |
| 6. It's a Scream | www.itsascream.co.uk |
| 7. Planet Britain | www.planet-britain.org |
| 8. Pro Plus | www.proplus.co.uk |
| 9. The Royal Horticultural Society | www.rhs.org.uk |
| 10. Wimbledon 98 | www.wimbledon.org |



Around 'the smoke' by bus and tube

Need to get from Wimbledon to Willesden Green? London Transport's web site shows you how to get around the capital and what to see once you're there. This LT poster (above) depicts one of London's famous street markets.

Visiting London (available in 15 languages) offers tube maps, bus routes and information on travel and tickets — but no explanation for those mysterious delays. www.londontransport.co.uk

Quake III abandoned as death enters the Arena

The news that Quake III is to be scrapped has brought forth a few howls from the gaming community. John Carmack of id Software has decided to abandon the development of a sequel to Quake II, and is making plans for Quake Arena — a deathmatch-only game. Quake Arena will focus on multi-player gaming, leaving single players to have deathmatches with AI-controlled player characters rather than monsters and enemies.

Carmack says that id will be able to ramp up the speed of Quake by moving to the multi-player model, but admits that some of the visual effects will have to be sacrificed. "After you've seen it a hundred times, the speed of the game is more



STATE OF PLAY

Games news from Etelka Clark

important," he said. Some fans are unhappy about the switch, however, saying that the suspense and atmosphere of Quake II will be lost. Watch this space for updates.

Ready,
aim, fire!
Quake
under
control

Short stories

Lander lights up DVD

■ Psygnosis is planning its first DVD-ROM game. Lander, a unique solar flight adventure delivering MPEG2 video, Dolby Digital music and 5.1 channel interactive sound effects, will be in the shops from November.

Driving you mad

■ The latest in the Microsoft gaming pipeline is Motocross Madness 3D, a stunt driving and racing game that captures the daredevil spirit of world-class supercross racing. It's due for release in the autumn.

Game on

■ ECTS 98 is fast approaching, so make a note in your diaries. The exhibition, taking place at London's Olympia from 6-8 September, will provide sneak previews of the games that will take the industry into the new millennium. www.ects.com

■ Screenplay this month features Motorhead, Incoming, Plane Crazy and Hercules [p290].

Reah life

■ Black Friar has created a game based around a hostile little planet called Reah that harbours a secret — it's actually a transfer portal into a parallel universe. This game is not just a standard graphic adventure, but is embedded with puzzles and gameplay-orientated towards problem-solving. Reah is out now, price £39.99.



Top 10 Games

		Last month
1	World Cup 98	E.A. -
2	Forsaken	Acclaim 9
3	Lula: The Sexy Empire	Take 2 5
4	Star Wars Supremacy	Virgin 3
5	Ultimate Soccer Manager 98	Cendant 1
6	Tomb Raider: Unfinished Business	Eidos 2
7	Grand Theft Auto: Special Edition	BMG 7
8	Championship Manager 2, 97/98	Eidos -
9	Quake 2	Activision -
10	Starship Titanic	Ablac 4

Top 10 Windows software

		Last month
1	Nuts and Bolts (3.1 + 95)	Xatlantic 3
2	Win 95 U/G and IE 4	Microsoft 2
3	Office Pro + Bookshelf U/G	Microsoft 1
4	TaxCalc 98	IDP -
5	Paint Shop Pro V5 FP CD	Digwork -
6	Office 97 Std C/VUP U/G CD	Microsoft 4
7	Partition Magic V3	Powerquest 8
8	Publisher 98 FP CD	Microsoft 9
9	Norton Antivirus v4 Deluxe	Symantec 5
10	AutoRoute 98 UK/EU Bundle	Microsoft -

Top 10 DOS software

1	DOS 2 Win95 U/G with Internet	Microsoft 1
2	DOS v6.22 U/G	Microsoft 9
3	Supercalc v5.5	CA -
4	Mail PC Remote 3.2	Microsoft 6
5	Back Office SVR v4	Microsoft -
6	WFWG 3.11 Base	Microsoft -
7	Intranetware 5-user	Novell -
8	Turbo Pascal v7.0	Borland 7
9	Corel WP 6.2 U/G	Corel 10
10	Nov. Any. 25 U/G 3.12 50 USR	Novell -

Top 10 CD-ROMs

		Last month
1	The X-Files	Fox Interactive -
2	Virtual Springfield	Fox Interactive 1
3	Simpsons Cartoon Studio	Fox Interactive 2
4	3D PC Pup Pet	Neechez 3
5	Encyclopaedia Britannica	Acclaim 6
6	Monty Python's Meaning of Life	Take 2 -
7	Davi Music 98	Davilex -
8	AA Pass First Time	MacroMedia -
9	Dance eJay	Fast Track 4
10	Easy Language: 25 World Languages	IMSI -

Top 10 peripherals

1	Astra 610P scanner	Umax 1
2	Astra 1210P scanner	Umax 2
3	3Com 56K v90 voice/fx ext	3Com -
4	Wheelmouse PS2/serial	Microsoft -
5	HP ScanJet 5100C	Hewlett-Packard 3
6	Sidewinder gamepad	Microsoft 7
7	Natural Keyboard Elite	Microsoft -
8	AWE64 Value ISA	Creative 10
9	MS Sidewinder Precision Pro	Microsoft 9
10	MS Intellimouse v3.0 (95)	Microsoft 6

• Top ten Windows and DOS software, and peripherals charts, supplied by Software Warehouse. Telephone 01675 466467

In the early eighties, like many twenty-somethings who, before the terrible truth eventually dawns, imagine they are possessed of some sort of literary or artistic bent, I was going through a Bohemian phase.

In common with everyone else's Bohemian phase, it didn't actually happen in Bohemia but, in my case, in the pavement cafés and shady bordellos of Tel Aviv. Every morning and evening would see me in the company of other like-minded shiftless spongers, discussing basic themes in Israeli literature (there are two: alienation from society and total alienation from society), charting the progress of our latest œuvre (usually still at the planning stage, and likely to remain there, permanently) and swapping witty *bons mots*.

On life, for example: "I say, life is so full of fools, is it not?" "To be sure. And, sad to say, those fools are so full of life." And on love: "Love? Love, my friend, is merely lust on an expense account." Leading to the follow-through: "My, my. 'A cynic is a man who knows the price of everything but the value of nothing.'" "Perhaps. But a cynic always pays cash and so, ultimately, gets the best deal out of life."

I know. Painful, isn't it? Anyway, to ensure these gems didn't go unrecorded, we'd whip out my typewriter and note them down for posterity. After two years, the total ordure count came to a full manuscript's worth. It took some persuasion, but one of Tel Aviv's worthy (il)literary societies was eventually conned into accepting the thing. Thereafter, thank God, it was totally forgotten. The guilty typewriter was an Olivetti "portable". If you're old enough, you might recall that the seventies/eighties' concept of portability basically applied to anything that had a handle attached, regardless of actual size, weight, or vertebra-cracking potential. Such was the Olivetti. If you suddenly heard that someone down in Jaffa was about to come out with a pithy aphorism and you were stuck up in Dizengoff Street, you could put your back out trying to manhandle it the mile or so across town in time. Happy days, though.

I had thought we wouldn't see their like again, what with subnotebook computers, palmtops and those ultra-miniaturised printers. But I reckoned without Brother UK. For there, last week in one of the Sunday supplements, was a full-page ad for a Brother LW-840lc portable colour word processor. Yours for a mere £429. "All things considered," it boasted, "Brother word processors aren't merely equal to PCs. They're far better." So up yours, Dell and Compaq.

Now that has surely got to be in the "can't tell it from butter", "best lager in the world", and "gives you an extra three inches" league of extravagant claims. How does Brother justify it?

First off, it shows you a picture of a desktop PC and an inkjet printer sitting forlornly side by side, like guests on the Jerry Springer Show, about to confess to having a

secret penchant for cross-dressing. The ways in which they could be improved are highlighted. "Give it a built-in screen"; "Ensure the hard disk won't crash"; and "Make it smaller". Underneath, there's a photograph of the Brother, already possessed of these many virtues. So why, at this point, don't the world's PC manufacturers just call in the receivers?

Head off to your local Dixons and have a hands-on, or just check out the technical spec on the web site www.brother.com and you'll discover why. The Brother's built-in screen is an antediluvian 14-line LCD display. Its hard disk is guaranteed not to crash, for the very simple reason that there isn't one. And as for "Make it smaller" — than what? Granted, at 16 x 16 x 4.5in and some 11lbs in weight, it is smaller and lighter than the aforementioned PC and inkjet combination. Just as a horse and buggy are smaller than a Range Rover and a caravan. But does this make them better? It certainly doesn't make them any more portable.

If they want to make a proper comparison here, it ought to be Brother word processor vs laptop and portable printer. No, this thing is typewriter technology, for goodness sake, aimed at people who wander into stores with "I don't know any better — please rip me off" placards round their neck. But what's their alternative?

Four years ago I tested a set of portable printers for



Michael Hewitt

Sounding Off

Ah, those heady days of mispent youth, hanging around Tel Aviv with a (portable) typewriter. Michael Hewitt recalls that in some ways, things haven't changed.

PCW. Nearly all of them would fit into a briefcase alongside a laptop. Four years ago. Admittedly, there were 386 or 486 machines. But, technically speaking, today, even those would still easily outperform a dedicated word processor in terms of versatility, functionality and raw power. Especially one that hasn't even got its own on-board battery.

Sure, there's no guarantee that what you typed into them would be of any higher quality than the garbage my colleagues and I turned out back in the eighties. Unlike the Olivetti typewriter, they'd at least have a Delete button.

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Following previous unhappy experiences with beta software, I waited until Microsoft gave out final copies of Windows 98 a week before its sales launch on 25th June.

The upgrade comes on CD-ROM and setup is almost fully automated. The software runs extensive checks to see whether the PC is suitable for an upgrade. Then it copies the program files. Windows 98 then converts the registry (the electronic index which Windows 95 continually uses to keep track of the programs and devices used with the PC). It was then that the plain sailing stopped. My PC carried out an automatic reboot and crashed. I could do nothing except switch off and on again. The PC then either displayed the same fatal message, or ran Windows 98 in Safe mode with no access to the CD-ROM drive or ports.

The upgrade process is supposed to give users the chance to go back to their original 95 system, but if the PC has crashed before completion of the upgrade, the vital recovery files will not be available. So, the PC is stuck in limbo, between a dead Windows 95 and a not-yet-working Windows 98. But Microsoft's technical support team were able to identify my problem. "This happens to machines with loads of entries in the registry which have been running for a long time. We've seen it many times. It's something that affects power users."

If (through no fault of the user) the registry has any incorrect entries, the conversion process fails. Windows 98 then tries to run a plug-and-play check and if this fails to agree with the registry, the whole pack of cards comes down. The only escape route is to go to DOS and run the installation CD-ROM from there. Also, the Windows 98 installation software needs at least 430Kb of free base memory to run. If other programs are automatically started by the config.sys and autoexec.bat files, there will not be enough memory without manually removing them out and rebooting into DOS.

If the hard disk is compressed, it cannot be accessed unless the compression software is run, which may take too much memory for the setup program to start. Then, the only way to trick setup into working is to use the command "setup /im", which skips the memory check. Later, hit Esc to force Setup to skip the Scandisk check on the disc. Finally, cross fingers, or pray.

Reinstalling Windows 98 into the default Windows directory will probably give the same error because the registry in it is now hopelessly corrupt. The solution is to reinstall 98 in a non-default directory (e.g. Windows 98). Do not delete the dead Windows directory to release disk space, or you will forfeit the chance of recovering any data from its files.

Reinstalling in a non-default directory means that Windows 98 cannot directly access settings stored in the Windows directory by 95. All links with other applications are lost. Setup warns users that they will have to reinstall

their programs. Don't be tempted to rebuild the links by creating shortcuts to the program files. This is only safe if the programs are simple. If full-blown Windows programs are re-linked in this way, the new 98 registry is corrupted. Re-loading Windows in a non-default directory can also upset the PC's DOS startup files.

I've found that some Windows 95 drivers do not work with 98. In some cases, Windows 98 fails to recognise the device even though it worked perfectly under 95. More seriously, the essential driver for my Philips 3610 CD-Recorder (Adaptec's Direct CD) crashed Windows 98.

Microsoft launched Windows 98 in the UK without a press conference at which to raise issues like this. Instead, the company planned a Fun Party. The only opportunity for discussion was when Sony launched its Vaio computers a few days earlier. I raised the upgrade issue with Sandy Duncan, Microsoft's Director of Organisation in Europe, and his response was flip disinterest. Within minutes, two computer journalists who had also just received their copies of the final version, told me that they, too, had hit problems.

Microsoft's spokeswoman Jane Franklin seemed surprised at my suggestion that Microsoft should warn power users. "We expect the consumer to check that their PCs can run new software," she told me. I tried



Barry Fox

Straight Talking

Barry Fox, power user, suffers Windows 98 dealing a death blow to his PC. He is further frustrated by a Microsoft US head office person ignorant of the existence of the registry.

phoning Microsoft's head office in the USA and was referred to spokeswoman Marla Polenz. "What's a registry?" she asked me, before promising to get back. She never did.

Microsoft UK's Windows Product Marketing Manager, David Weeks, says that no problem with the registry had been "flagged" to him. Which is odd when you bear in mind what his own technical people had already told me.

Weeks hopes my discoveries are unique to me. So do I. Otherwise, a lot of people who buy upgrades are in for the same nightmare I suffered.

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There's a book, now ten years old, which I think everyone in business ought to own. It's called *The Psychology of Everyday Things*, and is written by Donald Norman. It starts from a simple premise: when we have problems making something unusual work, we blame the thing.

But if, on the other hand, we have problems with everyday things, it's obvious that we ought to be able to cope, so we blame ourselves. The trouble is, many everyday things aren't designed to be easy to use. Rather, they're designed to look good. As Norman says, they probably won a prize when they were designed but they're a nightmare for the user.

Take a simple, household example. Most cookers have four rings, arranged in a rough square. Nine times out of ten, the controls for these rings are in a straight line. Designers like the look of tidy, straight lines. The trouble is, there is no way for you to work out which knob is which. You have to check the picture on the front. We've had our cooker maybe ten years, and I still have to look. If the designers had taken the trouble to arrange the controls in a square it would have been immediately obvious, but they didn't.

It's not just a domestic problem. I work with a large UK company which has just built a beautiful new headquarters. It really is a joy to be there, yet it is littered with design faults that Norman predicts.

Take a simple visit to the toilet. The entry door has a pull handle on it, so you pull. Clunk — the door won't open. You have to push it. Design spotters will see this one everywhere: designers love symmetry, so they put pull handles on both sides of a door, even though a push plate would make it absolutely clear what to do. At the risk of being considered strange, I stood and watched people going into the loo: time after time they tried to pull the door, hit the stop and then pushed. And because it was just a door, they probably blamed themselves for getting it wrong.

When Norman wrote his book, PCs were relatively rare, but he points out the same problems in the computer world. Back then, only the Mac had a graphical interface, so a lot of his concern was with DOS-style text interfaces. Now we've all got Windows, everything is simple, right? Hmm. And now that computers have become part of the everyday, we have thousands (no, millions) of people blaming themselves for finding them difficult.

Every designer should keep Norman's four key points in mind. One, there must be visibility — you should be able to see what you can do without having to dig in too deep. In a physical sense, this might mean not having a glass door where it isn't obvious which side to push: visible hinges help. In software it's about bringing the functionality to the fore, not hiding it in ten layers of menus and dialogs.

Secondly, Norman suggests we need a good

conceptual model, to predict the outcome of our actions. If we understand the underlying principle, we can take the correct steps to make something happen. Clicking a button in a GUI has a good conceptual model — it's like the real world. But you don't double-press real objects, so the model falls apart when it comes to double-clicking. A poor conceptual model makes double-clicking unnatural (hence it has all but disappeared from Windows 98).

The third concept is mapping. If there's no direct link between what you do and the outcome, you need something to demonstrate what is going to happen. The cooker example we saw earlier shows bad mapping: I can't see which switch is wired to which ring, and there's nothing in the straight line of knobs to indicate the relationship.

Finally comes feedback. In the natural world, most actions result in some form of feedback, giving you clues as to what is happening. Sadly, designers often conceal feedback, sacrificing it to good looks. Computers don't have natural feedback, so it's down to the programmers to provide it.

Whenever anything takes more than a couple of seconds, the computer should do two things. Firstly, it needs to say "I'm busy" — the Windows hourglass is the classic example of this — but also it should give some



Brian Clegg

Business Matters

Design decisions can be taken to an extreme: the pushable door with the pullable handle just there for symmetry. Brian Clegg looks at the effects on computers.

idea of progress. That way, the user knows that something is happening and that the system hasn't locked up. Studies have shown that feedback alone makes processes subjectively speed up, and that the reassurance factor is huge.

Try revisiting the world with eyes open to design. What works naturally, and what gets in the way? If you have the opportunity, complain to the manufacturer or the designer when they keep making the same old mistakes, and point them to the book that could change their world view for the better.

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Entertainment, for me, takes the form of a game of “Technological Chicken”, or TC. It involves pushing your machine to the limits of its capabilities and then pushing it some more.

What you do is, you fill your PC to the gunwales with hardware and software, and then start fiddling with it. A new sound card here, an upgrade there. You keep going until *just* before the point where you lose all your data and have to reformat the hard disk. The rules are thus:

1. The machine must be your main PC.
2. To prepare, you must fill every slot. Every IRQ must be spoken for and each COM port shared among multiple devices. Any SCSI IDs, if available, must be used.
3. Extra points are awarded according to the percentage of your hard disk filled with shareware. Double points for beta software.
4. Minus points for backing up.
5. The game begins when you can say “Everything is just humming”.

Now, you look around your system until you find the thing that’s not *quite* perfect, that is just about right but could work that much better if it were tweaked. The Thing, you see, is always there. For me, it’s usually to do with cross-product integration. When I see the trigger words “Now works with Outlook 98”, it has the same effect as when I see the words “with cinnamon” on a menu. I could well be about to order “Moose faeces, boiled in lark’s vomit, topped with crunchy larvae and sprinkled with cinnamon” but I’ll order it all the same. Thusly, with “Now works with Outlook 98”. I cannot stand the idea of having two databases, even if it’s my list of friends (yeah, yeah... both of them). That’s when PDAs become valuable; when they work with my existing PIM.

But, however my system is working, I can always hear that siren call “If only...” in my ear. If only my PC did this one, tiny thing slightly better, it would be perfect. That is The Thing. This month, TC knocked me offline. Well, Windows 98 really. Or at least something called my Windows Internet extensions, whatever they were.

I used to play TC Hardball. I remember installing Windows 95 when it was still in beta Chicago form, back in May ’94. This, I remind you, is the same Windows 95 that was not considered fit for human consumption until August ’95. I had just got back from a Microsoft technology workshop in Seattle — the first time 95 had been shown in depth to outsiders. While the US journalists whooped and hollered at every new feature like a Jerry Springer audience (“Oooh, look! A volume control!”) we, as upstanding, self-respecting *British* journalists, looked as apathetic and indifferent as we could manage (despite being secretly just a wee bit impressed).

So, in the spirit of the ongoing game of TC, I returned to work that balmy May and slammed that beta onto my hard disk, basking in the knowledge that I, the proud and

sole guardian of the new OS, was the envy of my colleagues. Sure enough, through the consistent howls of laughter and rolling of eyes as they watched me fight with crashes, reboots and reformats for over a year, I could clearly discern their jealousy and admiration.

I was younger then. More foolhardy. Now, considerably more mature, I awaited final code before installing Windows 98 on my main machine. What could possibly go wrong? It is, after all, little more than a bug fix and performance tweak of an established product, rather than the revolutionary jump from Windows 3.11 to 95.

Imagine, then, my surprise when things started to go badly wrong. I should, perhaps, have had an inkling when my TV blew up during the first weekend of the World Cup (Cameroon vs Austria). But let’s get back to my main PC. First things first: upgrade those hard disks to FAT32. And, in another example of my growing maturity, I backed up the two drives, separately, to Jaz disks. One drive contained all my personal files, articles, accounts and so on. The other contained all the downloads and drivers that I save in case I need to reinstall something. I had to reformat the drives before upgrading them, but it all went smoothly.

Imagine my surprise when I came to restore the two drives. Both were unrestoreable, in different ways. One was completely corrupted, the other had failed to back up anything much beyond the directory structure. Iomega, generally a decent bunch, are doing what they can, but my disks are on their way to recovery people now.



Paul Smith

Out of Site

Dare you play that PC form of Russian roulette known as TC? Paul Smith is so hooked, he installs Windows 98 and sees IE4 and other apps go out the window.

Once I got over that, I returned to Windows to be greeted with a message that told me: an error has occurred in the Windows Internet Extensions, please shoot yourself. This related only to IE4, not any other TCP/IP application. But (*nota bene*, US Department of Justice) you just cannot uninstall and reinstall IE4. It turns out that Windows 98 just brings out the worst in other applications (this time something called Net.Medic). So I face a month of nightmares.

Still, as I write, it could be worse: England go out to some South American country on penalties.

■ Paul Smith lives at www.paulsmith.com



Letters

Each month we are offering a 17in Taxan Ergovision 750 TCO95 monitor to the winner of the Star Letter. So, why not write to us? You could be the winner. You won't regret it!

Send your letters to:

**The Editor
Personal Computer
World
VNU House
32-34 Broadwick
Street
London W1A 2HG**

or email
letters@pcw.co.uk

or fax 0171 316 9313

For the complete range of Taxan monitors, call 01344 484646 or visit the web site at www.taxan.co.uk



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T O K Y O , J A P A N

You won't regret it.

Celeron concerns

■ Like every other magazine, you have comprehensively bashed the Celeron (*PCW August*), citing its low performance on common benchmarks due to lack of Level 2 cache. This is true; but a Celeron PC is aimed at the student, family or first-time buyer, who are most likely to be running modest office or web applications.

The only application where processing power is important for such users is games. However, a Celeron running, say, *Quake 2* will produce almost identical performance to a normal P2 at the same clock rate (since it has the same FPU), which is likely to be rather faster than the K6 performance and a lot faster than the Cxrix performance.

Another "fringe" benefit you don't touch upon is the Celeron's excellent capacity for overclocking. Many respected hardware web sites, such as Tom's Hardware Guide www.tomshardwareguide.com and Anand's hardware page www.anandtech.com have commented on this. Tom's Hardware Guide reckons you can almost certainly overclock a Celeron 266 to at least 350MHz (on a BX board) and possibly to 400. So, the upshot is that you can get a chip that performs perfectly well in normal apps and at almost the same speed as a P2-350 in games for under £100. Sounds like a good deal to me.

Adam Williamson
adam@scisoft.force9.co.uk

Switched on — but let's snooze first

Thanks for your review of Windows 98 in the August edition. The chart showing that Windows 98 was even slower than 95 in starting up and re-booting was of particular interest. Older readers (by this I mean anyone like myself over 30) will remember how in days gone by, devices like radios and televisions took their time in "warming up", a process whereby some minutes after turning them on, the voices and/or pictures would gradually fade in. The advance of technology has removed this in new TVs and radios, but with Windows 98 (and, I'm sure, NT 5) the reverse seems to be true.

I work as one of 25 contractors, and every day we have to wait for about five unproductive minutes for our machine to become ready for use. So, every day that's just over two hours of our time wasted. On a worldwide basis, it would be interesting to think that the equivalent of person-years are spent every day in watching Windows logos and hourglass cursors.

Windows 98 supports the concept of "OnNowPC" which would appear to solve this problem by putting the computer into "sleep" mode. However, can this be described as cutting-edge technology? Haven't we had snoozing laptops for years?

Bill Gates *et al* are continually trumpeting the idea of the PC becoming part of home life. Will most consumers willingly buy, and then replace every couple of years, an item which takes longer and longer to become operational?

Ben Smith Ben@bjsmith.demon.co.uk

Gordon Laing replies: Along with the small matters of ease of use and obsolescence, the PC will not be welcomed into the fold of consumer electronics until it can start quickly. I have been using OnNow (under the release candidate 2 of Windows 98) to standby and wake up my PC each working day now for a fortnight. Everything was hunky dory, with my system kicking into action or passing out in seconds, until I discovered my Windows temp folder was not dispensing with the now 134Mb of accumulated and redundant files — and I've hardly touched any apps other than Office. I'm sure that's just my PC, though. The good news, Ben, is that you win a nice new Taxan monitor, which switches on almost immediately.

■ It was with great interest that I read of Intel's latest processor, the Celeron, which uses the proprietary Slot 1 of the Pentium II but lacks the important (and expensive) L2

cache. This causes the processor to sound a lot faster on paper than it really is. I can't help thinking that this sounds suspiciously like an Intel marketing ploy designed to lure

**STAR
LETTER**

unsuspecting customers into buying Slot 1 systems, thus leaving other Intel Slot 1 processors such as the Pentium II as their only viable route for upgrade.

My own next computer purchase is likely to be the new NetWinder from the Corel Computer Corporation. This interesting new device is a compact, low-power, low-cost, high-speed Strongarm-based system with impressive networking, graphics and audio capabilities, as well as the extremely powerful and stable Linux OS installed and configured as standard.

Since Linux is a free, open source project, operating-system upgrades will be available for the cost of the distribution of a CD-ROM or the phone charges incurred downloading it from the NetWinder.org ftp site. See www.netwinder.org and

www.corelcomputer.com for more information.

Alex Holden

alex_holden@geocities.com

PCW replies: With reference to Adam Williamson's letter, while a cacheless Celeron may in theory offer similar games performance to an equivalent clock-speed PII, so long as they've got the same 3D graphics card, this is an oversimplistic view. In practice its not so cut and dried, and there's the fact that few truly budget Celeron systems have come our way.

The great cable debate

■ It's great to see companies like ComTel making the long-awaited progression to cable modems. But the reality is that 95% of us don't live in the right catchment areas.

As a regular internet user I'm faced with a bill of around £100

per month from BT, and I'm not the only one. Friends in the US have access to cable, ASDL or ISDN for much the same line-rental as a standard UK analogue line. Their lines are dedicated 24-hours-a-day, 356-days-a-year unlimited usage. So why are we stuck with our puny analogue modems running at best at 56Kbps?

The answer lies with BT. US telecom companies are small and striving to beat their competitors with a better, cheaper package. In the UK, BT still dominates the market, even with new cable companies emerging.

As an ISDN customer I fell victim to BT's cunning advertising schemes and dived right in to a two-year contract. For what I'm paying, I could have a 1.544Mbit/sec T1 line in the US.

Francis Wong

root@loaded.net

■ Why is it that Manchester gets all the new technology? Cable modems have been tried and tested there by at least two or three companies in the UK since as early as 96; maybe I should move? Why is it taking so long for ISP (or cable) companies to get started on the problem?

The technology is available, it has been proved to work, it will no doubt prove to be profitable and especially so for those companies who get their act sorted out first.

So far as I can tell, a few standards have been agreed on and Americans are already getting a ping of less than 20 in Quake, thanks to cable modems. Surely by the time everything gets sorted out, at the current rate of progress we will have no need of modems thanks to virtual reality and other great things from William Gibson novels. **p68 >**

Why is a company like C&W quite pleased with the current state and not doing anything to promote cable modems? A 1Mbit/sec transfer rate over electricity lines [as being developed by Nortel] doesn't sound so bad either... Anything to stop those silly ads about how ISDN will change the way you work.

At Velev
Grit@mcomail.com

Clive Akass replies: Cable companies have been incredibly slow to latch on, partly because they were set up as entertainment rather than communications vendors and some still have that mindset. But they are changing — see this month's Newsprint.

Lord alone knows why BT has started plugging ISDN to the hilt at the very point where the technology is going out of date. The good news is that no-one in the industry will be able to afford to stand still over the next few months. Digital broadcasting promises virtually zero-cost data delivery, which will change almost overnight the pattern of web usage and force cable companies and telcos to compete. And don't get the idea that everything across the pond is greener. We have a more homogeneous system here, so technology can be more easily deployed when it does come. European digital cellphone technology is far more advanced and so are our satellite systems — largely because America concentrated more on cable.

Clocking on — eventually

■ I recently examined the Award BIOS of my Pentium II 233MHz system to see exactly how much I could tweak it. One of the options was to change the bus speed, which I gradually increased from 66, to 75 to 83 MHz. The system ran perfectly

at all speeds and quoted itself as being a 291MHz Pentium.

All was fine with my original 32Mb SDRAM, but when I installed an additional 16Mb I started to have problems. The machine would return "Illegal operation" errors whenever I opened any applications and would occasionally restart itself without warning. I moved the 16Mb DIMM to another slot, which stopped the errors, so I now have a 48Mb machine running at almost 300MHz.

Make sure you keep the machine cool (I've got three fans inside it now) and don't mount hard drives on top of one another as that just creates far too much heat — as I found out one sunny afternoon.

Richard Harrison
Harri25916@aol.com

■ Thanks for the interesting article on CPU overclocking in July's PCW. My system is a 90MHz Pentium on a Triton FX motherboard. Jumpers are provided to set the bus speed (60 or 66MHz) and the CPU speed (1.5x, 2x, 2.5x or 3x.) After making sure that my CPU cooling fan worked, I tried the following permutations:

- 100MHz (66 x 1.5) — OK, system appears stable;
- 120MHz (60 x 2) — OK, system appears stable;
- 133MHz (66 x 2) — system comes up, BIOS reports 133MHz but Windows 95 won't start;
- 150MHz and above — system won't come up at all.

The voltage setting on my system had been set to 3.45V at the factory, so I didn't change it. I have now been running at 120MHz for a couple of weeks, with no apparent problems.

John Hudson
JHUDSON@raychem.com

PCW replies: If you're into over-clocking, try a few simple benchmarks on your system to

Everything in the garden's lovely and spicy



I do enjoy your magazine. However, not all of the CDs are useful forever, so I thought I would show you what I do with them when I have extracted all the juice I can. Since I took the picture, someone has climbed into the garden and stolen the CDs. I hope they get good use of them.

Mind you, they probably thought they were music CDs, but who in their right mind would use Spice Girls CDs to scare off the birds? Oh yes — Scary Spice!

Reverend Trevor Davidson
106407.2646@compuserve.com

see which combination offers the best overall results; often, increasing the external bus speed is preferential to just trying to get the fastest main CPU speed possible. Note that while some combinations of over-clocking seems to work on most systems, it is done at the user's own risk.

USB support

■ With reference to August's Star Letter concerning USB support on older versions of Windows 95. Although Windows 95 OSR2 was an OEM-only release, it was mainly a collection of the various updates released from Microsoft (Service Packs etc). A setup approaching OSR2 can be obtained by just applying all the released patches.

To use USB you need to update OSR2 to OSR2.1. This is available from some OEMs, for free. Try searching the support directories of these sites, for instance:

- ftp://ftp.gw2k.com/pub/hardware_support/
- www.micronpc.com/
- <ftp://ftp.pc.ibm.com/>

Although Microsoft states that OSR2 cannot be got any other way than buying a new

computer, it is possible to get USB and AGP support without installing it from Microsoft's CD.

John Green
jgreen@goofy.sunion.warwick.ac.uk

■ When I had 95A I bought a new Gigabyte TX motherboard with USB ports. I don't have any USB devices, but I downloaded a driver from their web site to enable the ports. Also, installing 95B does not mean reinstalling apps. All you do is rename win.com, make a boot floppy that enables you to boot to DOS with 16-bit CD drivers loaded, and install 95B into c:\windows. It will overwrite your previous installation but keep all your settings.

Neil Gooderham
neil.gooderham@nomura.co.uk

PCW replies: Trawling through the support and driver database sections of OEM web sites may be the answer, but proceed with care. Microsoft is unlikely to offer technical support until you reinstall your original licensed version, thereby eliminating any patches you may have unofficially fitted.

Gadgets

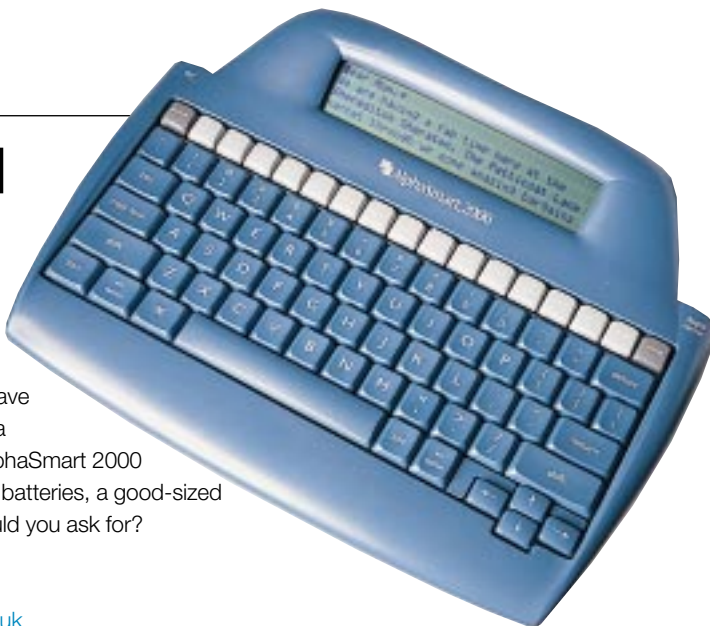
Compiled by Adam Evans. Photography by David Whyte.

The crafty keyboard

Life as a mobile professional is tough. Long hours on the motorway, the Best Rock and Pop Album in the World Ever playing over and over on the Mondeo's stereo, and having to drive really close behind all those annoying idiots who tootle around in the outside lane at a mere 80mph. And to add to their worries, if they want to do a little word processing, they have to choose between a heavy notebook with zero battery life or a lightweight palmtop with a keyboard the size of an ant. The AlphaSmart 2000 could be the answer to their worries: 300 hours from three AA batteries, a good-sized keyboard and compatible with PCs and Macs. What more could you ask for?

Price £233.83 (£199 ex VAT)

Contact Chromasonic 0181 203 8989 www.chromasonic.co.uk



Burn baby burn

Disco inferno... Yes, now you too can make the happeningest and rip-offest dance music tracks in the privacy of your own home. Get in the mix with over 1,000 CD-quality samples and playback up to 25 of them simultaneously using the Dance Station software. The supplied keyboard has 25 full-size, velocity-sensitive keys and features pitch bend and modulation wheels. Link the keyboard to your PC and you can change the pitch of a sample in real time and get down to some serious hands-on mixing.

Price £79.99 (£68.08 ex VAT)

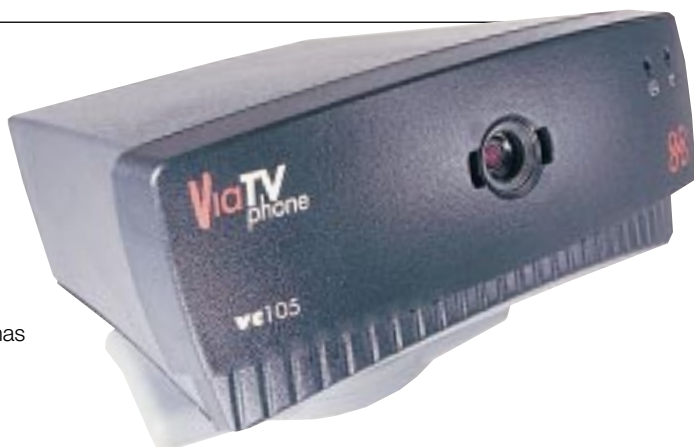
Contact Evolution 01525 372621 www.dancestation.com

Take a walk on the wild side

Finally, someone has come up with the most obvious videophone solution: using your television for the picture. ViaTV uses a normal telephone line in conjunction with your existing touchtone phone and television. The camera sits on top of your TV and sends your picture to the caller as you are looking at them. It really couldn't be simpler. The only criticism we have is that the name is rather dull; has no-one thought of the TellyPhone yet?

Price £399 (£339.58 ex VAT)

Contact 8x8 Ltd. 0800 980 8889 www.8x8.com

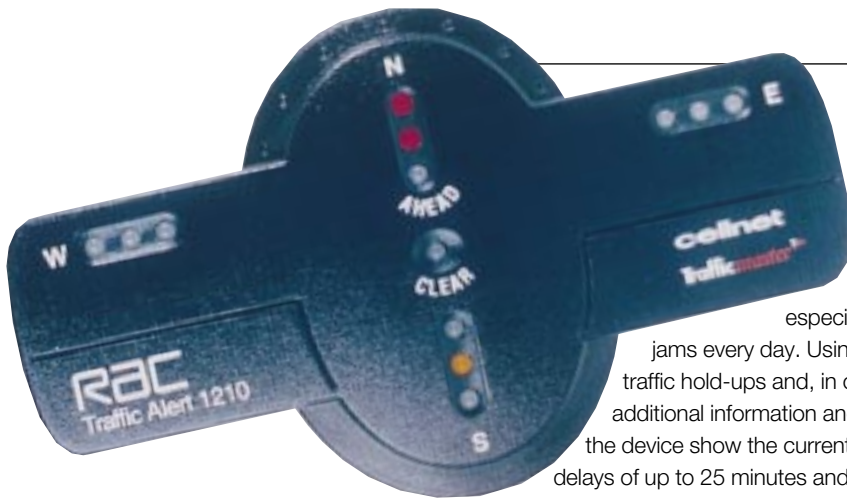
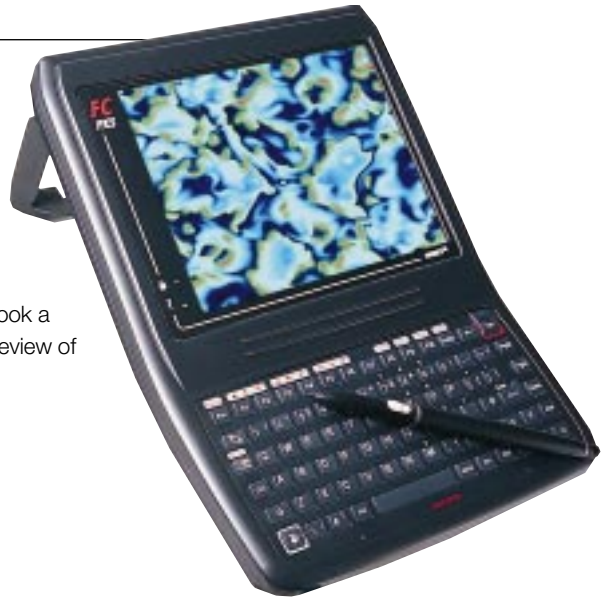


Tough as old boots

What is a husky's favourite food? Mush-rooms! But not this Husky, which actually prefers a diet of Microsoft Windows and a severe battering every couple of hours. It is, of course, a ruggedised notebook which you can drop, stand on, laugh at and bury in snow. Admittedly you can do these things to any notebook, but don't expect it to work afterwards. The limited specification and whopping great price make this strongman notebook a very specialised product indeed. See First Impressions (page 83) for a full review of the Husky FC-PX5 Colour.

Price £6,327.38 (£5,385.00 ex VAT)

Contact WPI Husky 01203 604 040 www.wpihusky.com



Lean, mean RACing machine

If you're a car owner, the RAC TrafficAlert 1210 could be one of the greatest gadgets you ever buy, especially if you're one of the 1.2 million people caught in traffic jams every day. Using real-time information from Trafficmaster, it warns of traffic hold-ups and, in conjunction with a Cellnet mobile phone, provides additional information and advice direct from the RAC travel team. The lights on the device show the current state of the motorway: green for clear roads, amber for delays of up to 25 minutes and red for those soul-destroying waits of over 25 minutes.

Price £29.99 (£25.53 ex VAT) or £14.99 (£12.76 ex VAT) to existing RAC members. Free to new RAC members taking out Standard Cover policies.

Contact Royal Automobile Club 0800 550550 www.rac.co.uk

Canon, no ball

Digital cameras are clunky-looking things for clunky-looking people, right? Wrong! The Canon PowerShot A5 is a glimpse of things to come. It's got sleek looks and classic design that cry out "Buy me! Buy me!" from the shop window. And with a top resolution of 1024 x 768, automatic focus and exposure, rechargeable lithium-ion battery and an optical viewfinder, it's packed full of features too. The photographs are stored on an 8Mb Compact Flash card which can hold 44 top-quality images and 236 highly compressed pictures at 512 x 384.

See First Impressions (page 88) for a full review of the Canon PowerShot A5.

Price £645.08 (£549 ex VAT)

Contact Canon 0121 680 8062 www.canon.co.uk



First Impressions

The Celeron processor sits in Tiny's home system (**below**) as AMD's K6-2 333MHz CPU prepares to take the edge off Intel's Slot 1 technology (**p80**). The PowerBook G3 is a return to form for Apple (**p81**), Adobe's Premiere 5 impresses (**p98**), and CyberAngel 2.0 sorts out security (**p99**).

■ Hardware

Home Value 300

It's a well-built 300MHz Celeron system. But how much value do you actually get for your money?

It is perhaps brave of Tiny Computers to call its latest PC the Home Value 300. The System is based around a 300MHz Celeron processor and on balance we're prepared to accept that it is aimed at home users. The value part of the equation, however, is a different matter.

On paper, the system looks a reasonably attractive proposition. An 8Gb hard disk, although not remarkable by current standards, is certainly generous and 64Mb of RAM provides plenty of headroom for applications. The rest is pretty much what we are coming to expect from sub-£1,000 PCs, with a 15in monitor, ATI graphics, integrated sound on the motherboard and an unbranded (read "cheap") pair of speakers.

At first glance, even its £849 price-tag looked attractive. But then the small print kicked in and we realised that neither VAT nor the software bundle was included. A grand total of £1,055.15 is rather less appetising when you consider that well-specified Pentium IIs are available from other manufacturers for less.

The system box is a reasonably attractive desktop unit and unusual in that most of the PCs we see are housed in tower cases. It has some styling cues and, with a good imagination, you can see these reflected in the design of the monitor. Inside (the lid comes off with just one screw) the box is neat and spacious.

The motherboard, based on the 440EX chipset, is a sub-ATX model with only one ISA slot (used for the 56Kbps) and two free PCI slots. It's dwarfed in the case and we were disappointed that there was no AGP slot. Graphics are provided by an on-board AGP adaptor. Although the 4Mb ATI Rage Pro chipset supplied is adequate, there is no scope for an AGP-based upgrade here. Decent Final Reality test results were belied by the fact that the cityscape sequence looked jerky; this is not a graphics solution we would choose for ourselves.

The situation is not helped by the choice of monitor. Stable enough at 800 x 600, the model supplied would not support an adequate refresh rate at 1024 x 768 and 60Hz is totally unsuited to

prolonged use. Moreover, the USB patch to Windows 95 hadn't been installed either and one side-effect of this is to disable AGP functionality.

Overall, we were unimpressed by the machine's setup. It arrived thinking it was a US machine and although its keyboard has instant-access buttons to a couple of applications and the audio CD player, Touch Manager needs to be running to enable these. Of course, you can add this to the StartUp folder yourself and correct the country setup in a matter of moments, but you shouldn't have to.

Family matters

Apart from Windows 95, software is not provided as standard, but Tiny Computers had pre-installed the Microsoft Family bundle on the machine we were sent. This includes Works and several multimedia titles but will set you back another £57.

Performance is similarly unexciting, with a BAPCo score of 221. This is good for a Celeron and is clearly boosted by the 64Mb of RAM which

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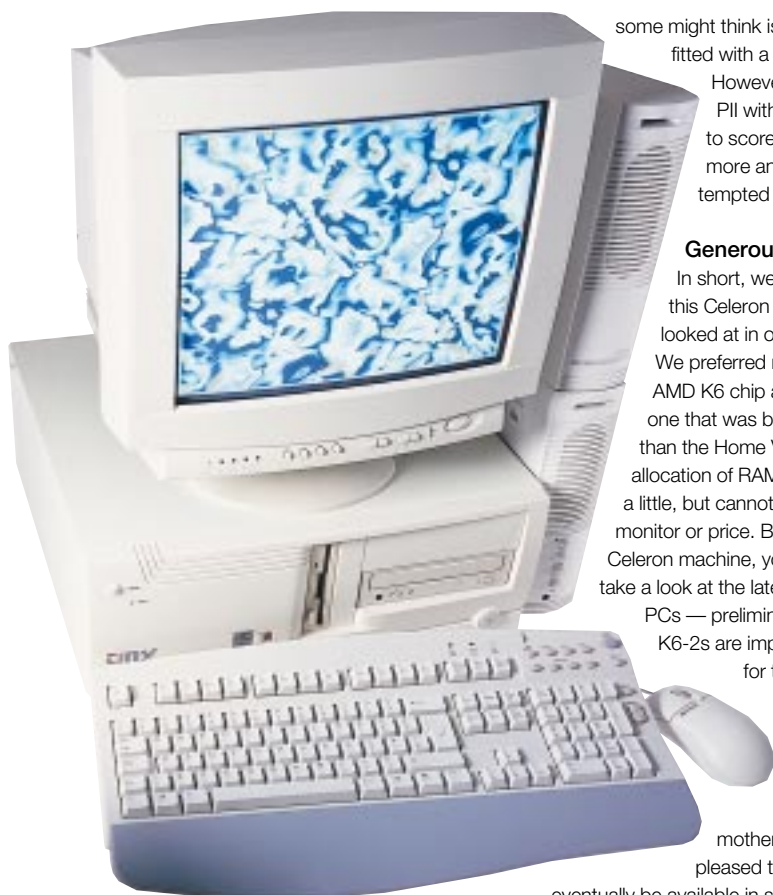
VNU European Labs



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

- ★★★★★ Buy while stocks last
- ★★★★☆ Great buy
- ★★★☆☆ Good buy
- ★★☆☆☆ Shop around
- ★☆☆☆☆ Not recommended



some might think is overkill for a machine fitted with a low-cost chip. However, we would expect a PII with the same clock speed to score about 35 percent more and so would be tempted to shop around.

Generous RAM

In short, we're as unconvinced by this Celeron as by any of those we looked at in our August group test. We preferred machines based on the AMD K6 chip and easily singled out one that was both cheaper and faster than the Home Value 300. Its generous allocation of RAM helps to close the gap a little, but cannot compensate for its monitor or price. Before shelling out for a Celeron machine, you'd be well advised to take a look at the latest generation of AMD PCs — preliminary tests on the first K6-2s are impressive — or even wait for the next version of Celeron. Due out in mid-September, Mendocino's 128Kb of L1 cache may help, while motherboard-spotholders will be pleased to know that it will eventually be available in socket form. Expected

to have 370 pins, it won't be compatible with existing designs but its planned introduction does tend to support the theory that Celeron's use of Slot One has more to do with marketing convenience than real performance issues.

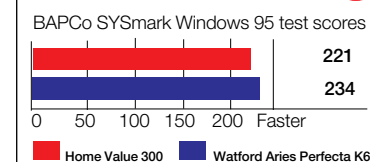
John Sabine

PCW Details

- Price** £997.58 (£849 ex VAT). Software bundle available for an additional £57.58 (£49 ex VAT).
- Contact** Tiny Computers 0800 821333 www.tinycomp.co.uk
- Good Points** Reasonable performance for a Celeron. Lots of RAM. Well built.
- Bad Points** Celeron processor. Monitor. Lack of expansion. Mean software bundle. It's not cheap, either.
- Conclusion** It may be pretty good for a Celeron, but you could buy a faster and better-specified Pentium II system for less.

★★★★★

Performance results



Hardware

AMD K6-2 333MHz

A cheaper CPU ready for the advent of DirectX 6.0 technology and with new 3D graphics functions.

The AMD K6-2 processor, combining 3DNow! instructions and superscalar MMX, takes advantage of an already established and well-respected design and improves upon it. The design in question is the Socket 7 slot, introduced to accommodate the original Pentium-class CPUs, years ago. Because Socket 7 is a proven infrastructure, PC makers can develop high-performance mainstream desktop systems without the higher research and development costs associated with a new platform like Intel's Slot 1.

The new Socket7/Super7 platforms deliver performance and features competitive with Slot 1 systems. Super7-specified motherboards are capable of system bus speeds of 100MHz and come with AGP slots as standard. SDRAM modules supporting increased bandwidths of 100MHz are also required to show off the new capabilities.

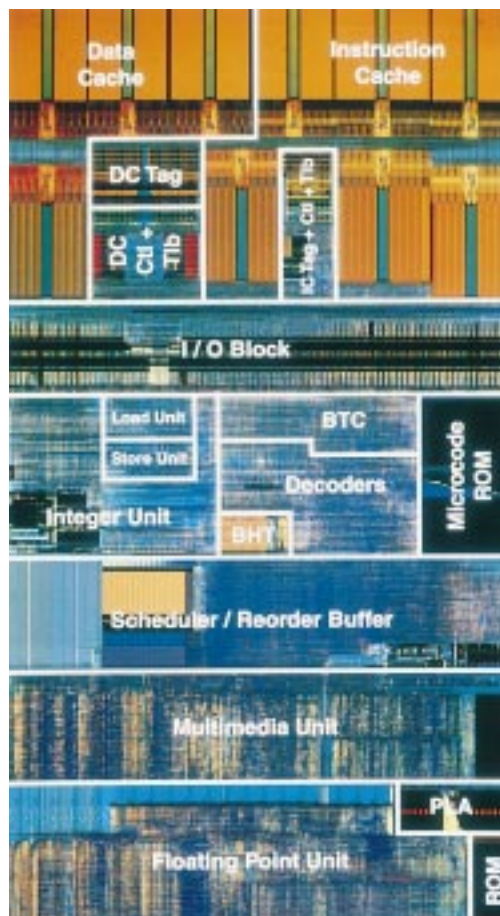
The 9.3 million transistor AMD K6-2 processor is manufactured on AMD's 0.25 micron, five-layer-metal process technology at AMD's Fab25 wafer fabrication facility and is packaged in a Socket7/Super7 platform-compatible, 321-pin chip. What this techno mumbo-jumbo means, is a less costly manufacturing process than Intel.

Unlocking performance benefits

3DNow!, supported by Microsoft's DirectX 6.0 (and expected this July), is a special instruction set that focuses on many of the more demanding 3D graphics processing requirements placed on CPUs these days.

The 3D graphics processing pipeline begins with modelling and geometry, which are floating-point intensive calculations, and ends with rasterisation (or rendering) which is handled primarily by 3D graphics accelerator cards. However, today's high-performance graphics accelerators are so adept at rendering that the CPU often cannot keep pace in pumping data through the pipeline and a bottleneck can ensue, hindering overall 3D graphics performance. The main cause of this bottleneck at the earlier stages in the graphics pipeline is that the CPU's floating-point performance has not kept pace with recent advances in graphics accelerator technology.

The 21 new instructions featured in 3DNow! use SIMD (Single Instruction Multiple Data). With these SIMD-style instructions and dual register execution pipelines, the AMD K6-2 processor can deliver up to four floating-point results per clock cycle. AMD claims to achieve a peak floating point performance (a measure of 3D



processing power) of more than four times that of the equivalent PII 333MHz.

Ultimately, DirectX 6.0 technology will be a key tool for realising the performance benefits of the AMD K6-2 processor. A DirectX API is a layer of software that provides special functionality to a program, independent of the underlying hardware. With this common interface, software developers do not have to create unique functionality with their applications if that functionality exists in the API.

Evaluation situation

A number of major players are embracing 3DNow! Technology, from software vendors such as Rage ("Incoming") and Epic MegaGames ("Unreal") to PC makers like IBM and Fujitsu. 3D graphics drivers optimised for 3DNow! technology will soon be available for Nvidia Riva 128, 3Dfx Voodoo2, ATI Rage Pro, and Matrox G-series graphics accelerators.

The evaluation system we received from AMD came with a system bus running at 95MHz with the CPU clocked at 3.5x (i.e. 333MHz). The processor had 64Kb Level 1 cache and 512Kb of Level 2 cache. The 64Mb SDRAM memory

was complemented by a Diamond Viper 330 graphics card (with an Nvidia Riva128 graphics chip) featuring a 4Mb SGRAM on-board, fitted in the AGP slot. A pre-release version of Microsoft's DirectX 6.0 and a pre-release Nvidia driver supporting 3DNow! technology were also set up on the machine.

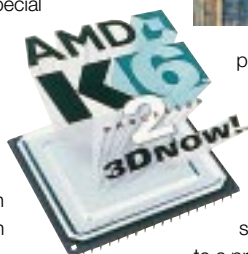
For comparison, a machine with the same graphics and memory specification was used but running a system bus speed of 100MHz with an Intel Pentium II CPU, again clocked at 3.5x (i.e. 350MHz).

The 3D performance test results using Final Reality were interesting: the Intel machine outgunned the AMD with an overall score of 3.56 against AMD's 3.08. This equates to 13 percent greater 3D performance by the Intel-based machine which has a faster CPU and system bus.

The application test results using BAPCo's SYSmark test for Windows 95 were, without a doubt, more in AMD's favour with a score of 318 over the Intel PC's 288. Take into account that AMD expects to price its K6-2s at almost 25 percent less than that of Intel's equivalent-speed Pentium IIs, and you can see that Intel has got a fight on its hands.

The AMD K6-2 processor is available now in clock speeds of 333MHz, 300MHz and 266MHz, priced respectively (ex VAT) at around £225, £168 and £111, each in 1,000-unit quantities. A 350MHz version is expected in the autumn with a 400MHz version ready to launch in time for Christmas.

Ian Robson



PCW Details

Price (Manufacturers' system prices TBA)

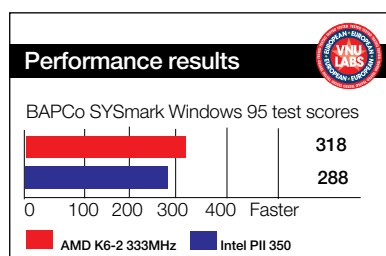
Contact AMD 01276 803100 www.amd.com

Good Points Attractive price. Larger choice of existing chipsets and BIOS over Slot 1 platforms.

Bad Points None that spring to mind.

Conclusion With massive industry support and an aggressive pricing policy, this truly competitive CPU may take the edge off Intel's Slot 1 innovation.

★★★★★



Hardware



Apple PowerBook G3

Apple bites back with this fast, stylish machine that is more than a match for any PC laptop.

The new PowerBook G3 models are all based on the high-speed G3 processor from Motorola, also known as the PowerPC 750. There are several versions of the PowerBook G3 but they all use the same basic design, simply providing different processor speeds and screen sizes. The cheapest model has a 233MHz processor, 12.1in dual-scan screen, 32Mb RAM and 2Gb hard disk, and costs about £1,695 (ex VAT).

Other standard features common to all PowerBook G3 models include a 20X CD-ROM drive a floppy drive and built-in 10Mbit Ethernet interface. There's also a 4Mbit IrDa infra-red port, 16-bit stereo audio input and output, built-in mono microphone, a VGA port and Apple's normal ADB, serial and SCSI ports. Annoyingly, Apple still uses a non-standard SCSI port in its laptops, which means that you must buy an adaptor cable to connect the PowerBook to external SCSI devices. However, the PowerBooks do use a standard PC card slot, which can accept two Type II or one Type III card.

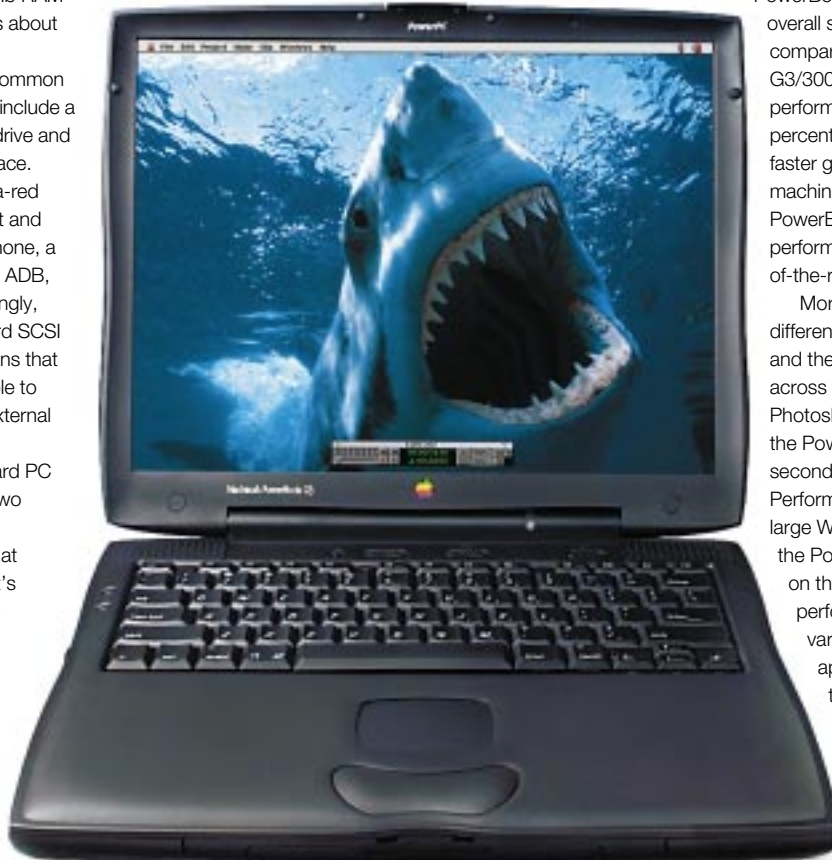
For this review we looked at the top-of-the-range model. It's not cheap, but it is in line with comparable high-end PC laptops from companies like Toshiba and Compaq. It runs at 292MHz with an excellent 14.1in active matrix display. It is supplied with 64Mb RAM as standard, with an 8Gb hard disk, 56K internal modem, 4Mb ATI Rage 3D graphics processor and S-Video output for connecting to TV or VCR equipment. It weighs about 3.5Kg, which is rather on the hefty side but not unusual for a laptop with such a large screen.

There are optional extras, too, such as DVD-ROM drives and Zip drives. Apple UK's new online store provides a build-to-order service so that you can specify the precise configuration you require.

There are expansion bays on either side of the unit and these are hot-swappable, allowing you to swap components without shutting down the machine. This means you can remove the CD-ROM drive and insert the floppy drive or a second battery pack without interrupting your work.

One of the things on which Steve Jobs has been concentrating is the industrial design of Apple's latest products. The new PowerBooks may not have the ice-blue translucent trimmings

of the iMac but they're a far cry from the slab-like design of most PC laptops. All four models have the same jet-black casing, designed with smooth curves along every edge. Apple claims this helps the PowerBook to slip into a briefcase but that's probably just an excuse for producing a laptop that looks and feels quite luxurious.



There's no doubt that the G3 is a good-looking bit of kit. The surprising thing about the PowerBook G3 is that its performance is equally good. Its main system bus runs at 83MHz, but the G3 processor has 1Mb of on-board "backside cache" which is connected to the processor by a separate bus running at 146MHz. It is this high-speed cache that gives the G3 processor such strong performance.

Apple claims that any G3 processor is almost twice as fast as a Pentium II running at the same clock speed. At the moment, the fastest Pentium II laptops run at just 266MHz, so Apple is proudly proclaiming that even the entry-level 233MHz PowerBook G3 is faster than any Pentium II laptop.

Another important feature of the G3 is that its low power requirements mean that it can run

unmodified in both desktop and laptop systems, so it should provide performance comparable to that of a desktop Mac.

To test both claims we compared the PowerBook G3/292 with a 300MHz Power Mac G3 desktop system, and also with a 266MHz Pentium II laptop. Using the Norton Utilities

System Info benchmarking software, the

PowerBook G3/292 achieved an overall system score of 653, compared to 700 for the Power Mac G3/300. The difference in performance is less than ten percent, and is mainly due to a faster graphics card in the desktop machine. This means that the PowerBook G3 really does provide performance comparable to a top-of-the-range desktop Mac.

More telling, though is the difference between the PowerBook and the Pentium II laptop. Scrolling across a 10Mb image file in Photoshop 5.0 took 25 seconds on the PowerBook and just over 100 seconds on the Pentium II laptop. Performing search-and-replace on a large Word file took 30 seconds on the PowerBook and 41 seconds on the Pentium II laptop. The performance advantage may vary from application to application, but it looks as though Apple's claim to have the world's fastest laptop is true.

So, the PowerBook G3 really is as good as it looks. It has a stylish design and compares well on both price and performance with even the most powerful PC laptops. Apple's recovery may not be complete, but with products like this, the company deserves to regain the sales it has lost over the past two years.

Cliff Joseph

PCW Details

Price £4,459.13 (£3,795 ex VAT)

Contact Apple UK 0800 127753 www.apple.com

Good Points Super-fast. Loads of features. Great build quality.

Bad Points Very fast. Fully-featured. Stylishly designed.

Conclusion It may be pricey, but the PowerBook G3 is more than a match for any PC laptop.

★★★★★

Hardware

Husky FC-PX5

This notebook won't set any speed records but boy, is it tough. Endurance is the key here.

Tougher than Arnie Schwarzenegger — and it doesn't fight back! The hunky, chunky Husky portable is built for endurance, not for speed.

When you're on the move, it can be far too easy for your notebook to take one too many bumps. And let's face it, just one sharp knock can be all it takes to turn a precious portable into a useless pile of plastic.

Military manoeuvres

If your job is prone to the sort of hazards that will have an average notebook knackered in less time than it takes to turn the thing on, then you'll want something like the Husky FC-PX5. Designed for endurance, its construction exceeds military test standards for impact and shock. It has also earned a few environmental standards, including the IEC68, EN60068, MIL-STD 810E and BS2011 thresholds for temperature, moisture, immersion, dust, sand, drop, shock, vibration and altitude!

In theory, you could drive a car over the FC-PX5, although we didn't test it quite that far. We did pour water over it, melt ice on it, stand on it, and kick it about the office a few times. It's a tough job, but hey, someone had to do it.

Did the PX5 stand up to that sort of treatment? After a lot of banging, dropping and generally abusing this notebook to our heart's content, the PX5 continued working without a glitch. We were impressed.

Open book

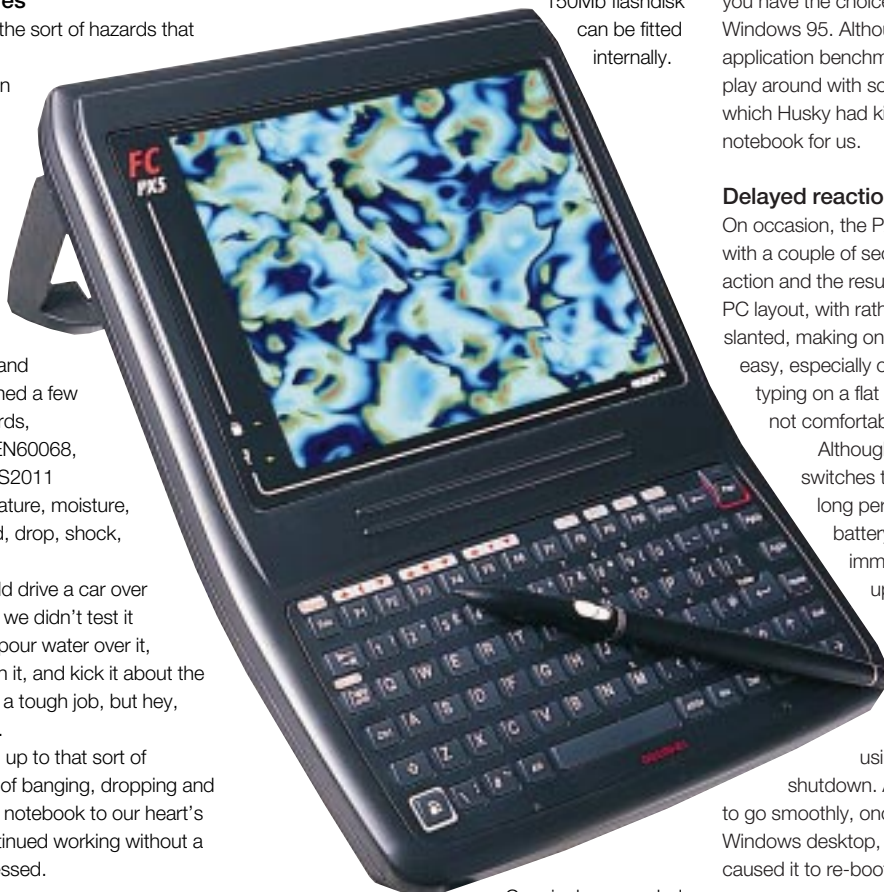
We reviewed the colour version, which has a 7.8in 256-colour 640 x 480 screen. Instead of the usual clamshell design, Husky uses an open-book design for its ruggedised range. This design slightly curves the notebook so that it fits easily into the crook of an arm. We found the PX5 to be fairly weighty, so suitably strong forearms will be handy. On the plus side, its footprint is smaller than A4 and it is just 4.3cm deep.

A special form of flexible but tough plastic protects the screen. Its matt black casing is made from a magnesium alloy-based material, designed to cope with accidental falls onto hard surfaces. Husky has replaced the hard disk, the most delicate part of a computer, with flashdisk

solid state mass storage technology from Scandisk.

On paper, the specifications for this notebook don't sound so impressive when compared to the high price, but you have to bear in mind that you're paying for its endurance, not its speed. An AMD X5 133MHz CPU lies at the heart of the PX5, supported by 24Mb of DRAM expandable to 32Mb. There's 150Mb supplied as standard and if you want more storage an additional

150Mb flashdisk can be fitted internally.



Cunningly concealed PCMCIA slots will allow the use of two PC Card devices. There are two internal PC Card bays for factory-fitted options. Coupled with a colour screen and Windows 95, this should prove enough for most outdoor users.

Instead of a mouse, there's a pen. A digitiser under the screen senses the position of the pen pointing device, so that it isn't necessary for the pen to be in contact with the screen to move the cursor. Right-button functions are available via a grey button on the side of the pen.

Testing, testing

Speed wise, we weren't able to run our usual PCW performance test as the PX5 we saw came with neither a CD-ROM nor a floppy drive. They

are not offered as internal options but you can connect external drives. The PX5 has two serial ports and a port replicator for which you can buy special cables for such things as hooking up the notebook to your desktop PC. These ports are hidden and protected by a retractable handle, which seemed flimsy compared to the robust design of the notebook in general.

No additional software is supplied as standard, other than the operating system where you have the choice of either Windows 3.1 or Windows 95. Although we couldn't run an office application benchmark test on the PX5, we did play around with some of the office applications which Husky had kindly pre-loaded onto the notebook for us.

Delayed reaction

On occasion, the PX5 was annoyingly sluggish with a couple of seconds' delay between an action and the result. The keyboard has a normal PC layout, with rather small keys which are slanted, making one-handed typing remarkably easy, especially on an uneven surface. Touch-typing on a flat surface is just about viable but not comfortable.

Although the standby feature, which switches the PC off when left idle for a long period of time, does save on battery power we were unable to immediately power the PX5 back up once it had gone into standby mode, and were forced to reboot instead.

Another annoying quirk was revealed when we tried restarting the notebook using the Windows 95 shutdown. Although the restart seemed to go smoothly, once we returned to the Windows desktop, hitting any key frustratingly caused it to re-boot again.

Lynley Oram

PCW

Details

Price £6,327.38 (£5,385 ex VAT)

Contact WPI Husky 01203 604040
www.wpihusky.com

Good Points Tough. Well-designed. Easy to handle.

Bad Points Quirky on/off. Occasionally sluggish response.

Conclusion The FC-PX5 withstood some heavy treatment and overall we were impressed.

★★★★★

■ Hardware

Canon BJC-50

This colour printer and scanner is commendably small: it really is easy to carry around.

About the same size as a pack of 200 duty-free cigarettes, the CMYK cartridge of this colour inkjet is interchangeable with a scanning head. Parallel or infra-red control makes this ideal for use with a notebook, so combining it with a laptop, a GSM mobile for data communications and the scanning cartridge makes this the ideal unit for working on-the-move.

On photocopy paper the draft quality, which delivered five pages of word-processed text in 2 minutes 14 seconds, was disappointing. And, although the characters were still

slightly feathered, they were much improved at normal quality with a page taking just 41 seconds to complete. An A4 photo, arriving after just 12 minutes' work, printed to within 2mm of the paper edge on three sides and 8mm at the

bottom but was slightly speckled, with the white of the page showing through. Business graphics were handled admirably although our 100 percent block of magenta and the gradually faded stripe which we use in our tests had a pinkish tinge to them in both Standard and High quality modes on photocopy paper and Canon's bubblejet paper. A reverse hairline was barely visible at high quality and totally lost at Standard,

which sets this printer slightly below some comparable models.

Graduated tones were smooth, however, with a

minimum of stepping on a scale that stretched from no coverage to 100 percent colour density. Taking the same refills as the more established BJC-80, this machine is cheap to run, but its standard configuration does not include the

optional automatic paper feeder which means you must supervise the device as you insert single pages. It is bundled with a Lithium Ion battery pack for when you can't get to a plug. This charges in four to six hours and acts as a guide for the paper slot. Setup was quick and simple and the maximum graphical resolution of what Canon claims is the world's smallest bubblejet printer is 720dpi.

Nik Rawlinson



PCW Details

Price £316.08 (£269 ex VAT)

Contact Canon 0121 680 8062

www.canon.co.uk

Good Points Small. IrDA interface. Battery pack. Scanning option.

Bad Points A little pricey. Paper-handling options are currently limited.

Conclusion Great for people on the go, but if its primary use is to be on a desk, you should consider the BJC-80 instead.

★★★★★

Nikon Coolpix 900

3X zoom puts the 900 out in front but you'll have to keep your cool waiting for that "click".

The latest Nikon digital camera features a removable 4Mb compact flash card which can store 24 basic, 12 normal or six fine-quality (1280 x 960 pixels) photos. Its 3X motorised zoom, meanwhile, puts it streets ahead of many other cameras that employ simulated zooms on a limited

good looks. A built-in flash and a ten-second self-timer were also useful and, these days, expected features. A 270-degree rotatable viewfinder and lens means that taking those obscure "art house" shots from strange angles should present no problems and save you risking neck strain. The PC software was some of the best we have seen on any camera of its type. Following

installation, we were presented with a new virtual drive in My Computer which, when opened, contained thumbnails of the images stored on the camera. It was

then simply a matter of dragging and dropping them to their destination and using the normal Windows controls to delete them from the camera.

The LCD was of excellent quality and had no refresh problems where the display lagged slightly behind the movement of the lens. What was disappointing, though, was the length of time it took for the unit to react each time we

pressed the shutter. It would often be as much as two seconds before the picture would be taken. As a result, it was unsuited to use in situations where snapping moving objects or fast actions was the intention.

The on-screen display was comprehensive and easy to use, giving us direct access to many of the camera's most useful features without the need to attach it to our PC. Batteries, all leads, a padded case and the necessary flash card were bundled with the kit but we were disappointed that there was no power lead.

Nik Rawlinson

PCW Details

Price £759 (£645.96 ex VAT). Premium bundle £859 (£731.06 ex VAT) includes power adapters and 12Mb storage card.

Contact Nikon 0800 230220 www.nikon.co.uk

Good Points Excellent picture quality.

Bad Points Slow reaction time.

Conclusion Great performer at an average price.

★★★★★



number of preset magnifications. Access to all ports is a breeze, with easy-to-open flip-down doors covering all sockets to retain this unit's classic

Hardware

LG StudioWorks 99T

A large dot-trio-tube monitor for the budget-conscious. It looks sharp and it's great value.

Most monitor manufacturers use aperture grille tubes (e.g. Mitsubishi's Diamondtron or Sony's Trinitron).

This 19in model, from LG Electronics, doesn't. The StudioWorks 99T, which has a viewable diagonal of 18in, uses an Invar shadow mask. Dot trio tubes commonly have a dot pitch of 0.28mm, but Invar shadow mask uses a metal alloy that doesn't expand with heat. The holes can be placed closer together, resulting in a dot pitch of only 0.26mm. The smaller dot pitch should result in sharper resolution and clarity of image.

We ran the 99T through our tests and it performed particularly well, with almost textbook results. Screen uniformity, colour scales, and horizontal and vertical convergence were all fine, and there were no common defects like streaking and ghosting. Colours produced were

rich and vibrant. There was some moiré, although this was only apparent in the fine pattern test, and a moiré reduction

control is available. We were slightly less impressed with the focus, which was a little less crisp on the right-hand side of the screen compared to the middle and left-hand edge. But this is a minor quibble, as focus overall was exceptionally crisp. The on-screen display includes the usual sizing and positional controls, as well as colour intensity and temperature adjustments, and manual degaussing. Two separate

dials placed under the screen give instant access to brightness and contrast. Providing that you've got the right support from your



graphics card, the 99T is capable of a maximum resolution of 1600 x 1,200 non-interlaced at a refresh rate of 75Hz. In addition to the humble PC, this monitor can be used with a Sun SPARC workstation, as well as other sources, using its BNC connectors. It is both TCO 95 and EPA Energy Star compliant.

Whether a user would prefer this type of monitor to an aperture grille device is a matter of personal preference, although graphic designers on a budget may be attracted by the price.

Lynley Oram

PCW Details

Price £559 (£475.74 ex VAT)

Contact LG Electronics 01753 500 400
www.lge.co.uk

Good Points Clarity of screen image. Price.

Bad Points None to worry about.

Conclusion Worth considering if you are on a tight budget and want a large monitor.

★★★★★

Umax Astra 1220P

A sturdy flatbed scanner that will give good results: text reproduction in particular is very good.

The Umax Astra 1220P stands apart from its cheaper stablemate, the 610P, in a few respects (see our group test, page 168).

It is slightly heavier and more sturdily built, and claims a full 36-bit colour depth. It has a top optical resolution of 600dpi and a maximum interpolated resolution of 9600dpi. Both the 1220P and 610P are parallel port scanners which easily connect to your PC's external parallel port — as long as you've got an enhanced parallel port. Users of older machines should check their hardware. It comes bundled with Adobe PhotoDeluxe, PageManager and OmniPage LE.

Surprisingly, the 1220P lacks a proper manual and there is no information about specialised

scanning or image editing. There is only a pamphlet which gives bare details of the procedure for driver installation and connection to the computer. Nevertheless, we managed to set up the scanner easily enough.

Like the Astra 610P, the 1220P (unusually) takes longer to make an A4 preview than it does for an average final scan, and it was generally a little on the slow side. It took an excruciating 41 seconds just to preview an A4 page, and then needed 26 seconds to scan the selected colour A5 portion at 150dpi.

And as if the tedium imposed by long scanning times were not enough, the 1220P was also not the quietest of peripherals towards the end of the scanning process.

The capable Vistascan driver interface offered

customisable controls for colour depth, gamma and contrast but the auto contrast option had little impact on the quality of the final output. The quality of the colour scan was average and there was some loss of detail at both ends of the spectrum.

Greyscales were reproduced with better clarity and very little bleeding between adjacent scales. The quality of text reproduction at the highest optical (600dpi) and interpolated resolutions was also extremely good.

Ajith Ram



PCW Details

Price £211.50 (£180 ex VAT)

Contact IMC 01344 871329 www.umax.co.uk

Good Points Good construction. Excellent black-and-white reproduction.

Bad Points Average colour reproduction. Relatively slow.

Conclusion A good scanner, but not bounds ahead of the best budget models.

★★★★★

■ Hardware

Relisys RL410A LCD

This nice-looking flat-panel monitor swivels on the desktop for maximum viewing comfort.

Relisys is the brand name of TECO Information Systems, a company which until now has concentrated on selling solely to PC system builders. Its 14.1in LCD monitor is one of the first flat panel displays to be sold under the company's own name, alongside a 15in model with a rotating screen. But first, a quick reminder: flat panel screen sizes are measured differently to normal monitor sizes. On an LCD panel, 14.1in does actually mean the length of the diagonal from one corner of the picture to the other and equates to a normal monitor slightly bigger than 15in. The advantages of flat panels are numerous. They are lighter, use less power and take up much less desk space. But there are disadvantages, too. They are much more expensive, can suffer problems in latching on to the signal from the PC's graphics card, and are only



really good for one resolution setting. The Relisys panel had no trouble in synchronising with the signal from our graphics card using the standard 60Hz setting used by most LCD screens. In addition to the standard 1024 x 768 resolution, the Relisys panel will handle full-screen

800 x 600 and 640 x 480

resolutions. But if you count on using these resolutions, flat panels in general are not a good idea because of their basic design. Without going into unnecessary

technical detail, this makes them (and this includes the Relisys screen) pretty dreadful for displaying resolutions

other than their designed maximum. Having said that, there aren't many users who would actually want to use the monitor at anything less than 1,024 x 768. The case and stand have been well designed and the whole thing looks stylish enough on the desktop. It is set at a good height and the screen swivels through enough degrees to satisfy anybody. The display itself is bright, colourful and stable, although we did occasionally notice a very slight distortion near the bottom of the screen. The on-screen controls included a temperature control for the colour settings.

Adam Evans

PCW Details

Price £851.88 (£725 ex VAT)

Contact Relisys 0161 876 8762

www.teco-info.com

Good Points Clear, sharp display.

Bad Points Occasional slight distortions.

Conclusion One to consider if you're after an LCD monitor.

★★★★★

Canon PowerShot A5

The future of happy snapping is in the frame in the shape of this functional digital camera.

Canon has made the move to digital less painful for the novice by casting its new PowerShot A5 in the IXUS mould of looks and ease of use. So, there is automatic exposure and focus, with a lens equivalent to the 35mm focal length on a 35mm film camera. To set the focus, you push the shutter button down half way and hold it until the camera beeps at you to say it is ready, then you push the button the rest of the way. The dial on top lets you see whether you are in play-back or recording mode and you can set the camera to take multiple shots together here, as well. There is an LCD for showing shots you have already taken, and a



viewfinder so you don't need to waste the battery when lining up shots. Together with a small LCD on the top of the camera, this lets you alter the menu settings, including resolution and compression rate. Although there are very few choices for you to make, there is a self-timer and a macro mode for taking close-ups.

The PowerShot A5 comes with an 8Mb Compact Flash card which will hold 44 images at the top resolution of 1024 x 768 with the least compression, or up to a staggering 236 images at the lower resolution of 512 x 384 and the greatest amount of compression.

The battery is not the usual set of A4s, but is a little Lithium-Ion model with a charger provided. The software is comprehensive, with easy-to-use TWAIN drivers

for downloading images and plenty of software packages for editing, playing around with and cataloguing your images.

The image quality seemed fine in the tests we carried out for this review, but we will be testing this camera more fully next month [October issue] in our digital camera group test.

For those who want something a little more sophisticated, Canon will be launching the PowerShot Pro 70 in the autumn, which is closer to an SLR film camera both in looks and functionality.

Adele Dyer

PCW Details

Price £645.08 (£549 ex VAT)

Contact Canon 0121 680 8062

www.canon.co.uk

Good Points Very easy to use. Plenty of memory as standard.

Bad Points Limited functionality if you want to do more than just point and shoot.

Conclusion The shape of things to come.

★★★★★

■ Hardware

Tally T9006

A budget mono laser printer which has a sheet feeder, too. It does the job, and at a nice price.

Although inkjet printers now offer good-quality reproduction, there still remains a gap between their quality and that of laser printers. Lasers, once the preserve of the rich and famous, are now seriously affordable to your average consumer, which must be a good thing. All the big guns in the industry offer laser printers at good prices, and about £300 seems to be a common starting price. The T9006 is one such budget laser printer but at this price you are obviously looking at a monochrome model — we'll have to wait a little longer for truly affordable colour laser printers.



The aesthetics of this model are fairly standard; neither pretty nor plain. The T9006 prints at the standard 600 x 600dpi and counts the printing of A4R, A5R, folio and envelopes among its repertoire. Included is the very useful 100-sheet feeder, which is a definite bonus. The T9006 is easy to install and the software is supplied on a 1.44Mb disk for those who still do not have a CD-ROM drive. There is no other bundled software apart from what is supplied by Tally (once known as Mannesmann Tally, the German printer manufacturer). The step-by-step guide is worth highlighting, as it leads you through the installation in an uncomplicated manner. The T9006 comes with 2Mb RAM, but

this is expandable via 72-pin SIMMs, up to 16Mb.

Print quality was in the "could do better" category. Although the text reproduction and general black-and-white printing was of a good standard, with no discernible banding, our tests showed that the printing of colour graphics images was slightly disappointing. Text itself printed out at an average of four pages per minute (using an MS Word document) which was less than the six claimed. Graphics — a standard bitmap file — printed at roughly one page every two minutes.

Jim Haryott

PCW Details

Price £316.07 (£269 ex VAT)

Contact Tally 0800 525318 www.tally.co.uk

Good Points Easy installation. Competitive price. Sheet feeder.

Bad Points Disappointing reproduction of colour graphics images. Slower speed than expected.

Conclusion The T9006 is really only an average performer, but it is competitively priced.

★★★★☆

Casio QV-5000SX

Editing and video capabilities are just two of the many impressive features of this digital camera.

Casio boasts that this is its best digital camera yet, and bearing in mind the mega-pixel maximum resolution of 1280 x 960, it's probably right. At this resolution, the 8Mb internal memory can store up to 17 images at a time with the least compression (highest quality). There are two other quality settings which bump up the number of shots to 33 and 64 respectively. The camera is also capable of shooting at 640 x 480 resolution and 102 of these lower-quality images can be held in the camera at one time.

The list of features on the QV-5000SX is impressive and includes auto focus, macro, 2X and 4X digital zoom, as well as a four-mode flash (off, automatic, fill-in, and red-eye reduction). But



perhaps the most impressive features are the movie and panorama capabilities. These enable the user to overlap a series of shots to create a panoramic effect which scrolls across the camera's LCD screen during playback, and to record a movie up to 6.4 seconds long at ten frames per second. The QV-5000SX also has a number of powerful editing tools. Graphics and handwriting text can be inserted into images, and there is a selection of seven text background plates including pretty ribbon and cloud patterns. There are five filters to change images on the camera, including monochrome and sepia effects. We found the

1.8in LCD panel a little too jerky for our liking but approved of the separate optical viewfinder. As you don't have to use the screen for taking pictures, battery life is extended enormously.

Along with a number of other digital cameras around at the moment, the QV-5000SX can display your photographs directly on a television screen. The output can be switched between PAL and NTSC, making it useful for viewing pictures while on holiday, and a video cable is included as standard.

Etelka Clark

PCW Details

Price RRP £499.99 (£425.53 ex VAT)

Contact Casio 0181 450 9131 www.casio.co.uk

Good Points Selection of editing tools and video capabilities.

Bad Points Unimpressive LCD panel.

Conclusion Impressive. But the range of cameras available at this price means it pays to shop around.

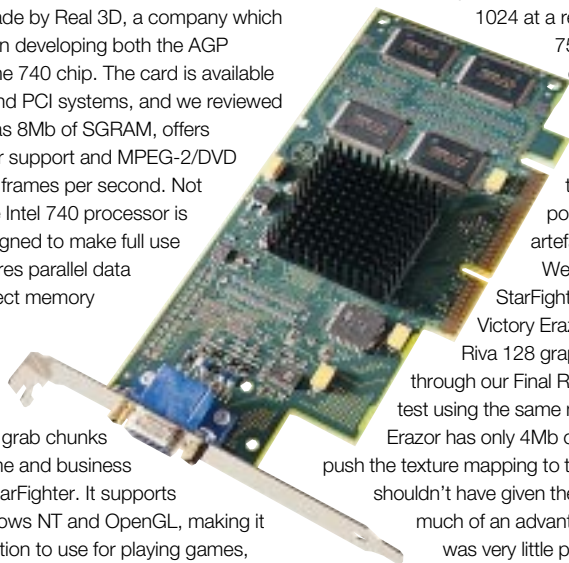
★★★★☆

Hardware

Real3D StarFighter 8Mb

The first Intel 740-based graphics accelerator card to hit the shelves is a good all-rounder.

The StarFighter AGP 2D/3D card is the first graphics accelerator card based on the Intel 740 processor to hit the retail shelves. It is made by Real 3D, a company which partnered Intel in developing both the AGP standard and the 740 chip. The card is available for both AGP and PCI systems, and we reviewed the former. It has 8Mb of SGRAM, offers multiple monitor support and MPEG-2/DVD decoding at 30 frames per second. Not surprisingly, the Intel 740 processor is specifically designed to make full use of AGP. It features parallel data processing, direct memory execution, and full 2X AGP sideband support. Real 3D is hoping to grab chunks of both the home and business markets with StarFighter. It supports Direct3D, Windows NT and OpenGL, making it an attractive option to use for playing games, computer-aided design and business applications. Resolutions of up to 1600 x 1200 at



256 colours with 70-75Hz refresh rate are supported. If you'd like more colours, the StarFighter will happily supply 1280 x 1024 at a refresh rate of 70-75Hz. The 3D graphics produced by this card were top notch. It happily rendered smooth textures and polygons with neither artefacts nor distortion. We ran both the StarFighter and the Elsa Victory Erazor (which uses the Riva 128 graphics accelerator) through our Final Reality benchmark test using the same machine. While the Erazor has only 4Mb of SGRAM, we didn't push the texture mapping to the max, so this shouldn't have given the StarFighter too much of an advantage. Overall, there was very little performance difference between the two cards, with the overall score of the StarFighter only just ahead of the

Erazor. The StarFighter did pull ahead of its rival in every one of the tests, but by the barest amount.

Lynley Oram

PCW Details

Price £99.99 (£85.10 ex VAT)

Contact 01332 294441 www.real3d.com

Good Points Price. Memory. Supports OpenGL and Direct3D.

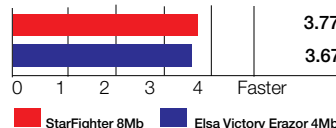
Bad Points Could have been a little faster on the performance side.

Conclusion A good all-rounder.

★★★★★

Performance results

3D Final Reality scores



0 1 2 3 4 Faster

StarFighter 8Mb Elsa Victory Erazor 4Mb

lomega Zip ATAPI

Crank up your storage with this affordable, fit-it-yourself internal drive. Don't worry — it's easy!

Chances are that most people will have heard of Zip, which is testament to the huge success of lomega's removable storage device. Sales can be measured by the millions rather than the thousands.

The internal Zip drive is not a new release as such. Indeed, it is available ready-installed on many machines. What *is* new is that you can now buy the ATAPI internal drive as a separate package, thereby allowing you to get

your screwdriver out and start tinkering.

If you have a modicum of experience with PCs, you should not have too many problems with the Zip installation. It attaches to your standard EIDE chain, much as a CD-ROM drive or hard drive would. Even if you are new to the game, you shouldn't worry much. lomega has packaged it extremely well and included easy-to-follow installation instructions and even an on-board video to ensure that you don't waste an absurd amount of time installing it.

Using the EIDE interface has other benefits, too. Data transfer rates are faster than via the parallel port

(although not as fast as using a SCSI connection). If you're stuck for room, you will neither need to use one of your precious PCI slots, nor your parallel port.

Some storage devices have settled on other capacities, ranging from 120Mb to 230Mb for this

type of product. The 100Mb capacity of the Zip seems to have worked well for most people, though.

The Zip ATAPI is available for either 3.5in or 5.25in sized front-loading bays on your PC.

At the price, the Zip ATAPI is nicely affordable. OK, so you don't get a zip disk thrown in, but they are pretty cheap anyway — certainly when compared to the £80 you would have to shell out for a Jaz 2Gb disk, for instance.

Jim Haryott



PCW Details

Price £119 (£101.28 ex VAT)

Contact lomega 0800 973194 www.lomega.com

Good Points Mainstream acceptance. Relatively sound technology and a good price.

Bad Points Not as fast as we had hoped.

Conclusion The Zip drive is a popular storage device at the right price. With the internal EIDE model you have a reasonably fast drive without needing a SCSI connection.

★★★★★

Software

Adobe Premiere 5.0

Professional-standard video editing software, packed with features you won't find elsewhere.

Video editing on a PC has never been more attainable and desktop video editing looks as if it is coming into its own. Compared to what was around three years ago, 400MHz Pentiums can now compress video in less than a third of the time it used to take, and all kinds of experimentation with video effects can be done in real time. Hard disk prices are lower, while capacities and transfer rates have more than trebled so now you can grab broadcast-quality video, with little loss in quality, on a home computer. And, with the new DV (Digital Video) cameras, you can import your video into your PC in digital form, obviating any interference noise that computer circuits generate. You can even edit and write your home movies onto DVD — but you'll have to wait for the new DVD players in order to play them back on your TV.

Editing processes require software, and no other program has had a better reputation in this field than Adobe Premiere. The program has grown from a small editor, developed for multimedia producers, to one now used by professionals in many small-to-medium sized video production companies.

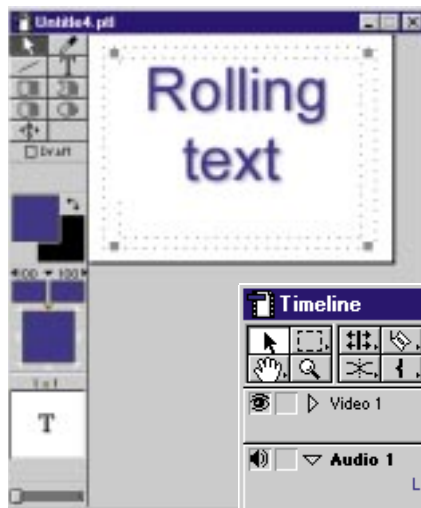
Professional facilities

In simple terms, you can capture raw video clips from tape (you need a video capture card), save them to hard disk, import them into Premiere, place them on a timeline and join them together or superimpose them (using all the sophisticated video effects you see on TV) to create a finished movie. You can then either output the movie to tape, or save it in compressed form for CD-ROM playback or for the internet.

Beyond those basics, the program offers many professional facilities. Amongst them, you can work with up to 99 video and 99 audio tracks on the timeline and you can edit the content of any of those tracks. There is a Monitor window which resembles the monitors in a conventional video editing studio, making it easier to edit clips and insert them on the timeline. This supports industry-standard shortcuts for efficient editing and lets you extract footage from an edited sequence, or perform 3-point edits. And you can switch to Trim mode to adjust clips frame by frame, relative to each other. The Undo feature lets you go back up to 32 steps.

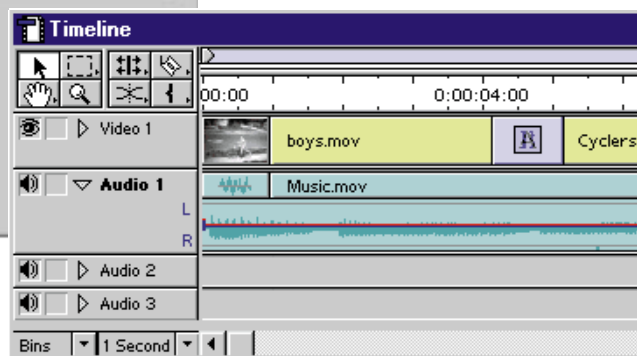
You can add text titles that move on the screen, that are superimposed, or which let the picture through. You simply open the Title window, enter your text and you have character-by-character control over font, size, colour, orientation, and other stylistic attributes. This is then treated as a video clip and added to the rest of your movie.

One of the areas in which this new version



Above Creating video titles

Right Editing Audio on the TimeLine



Below Marking the "in" point of a video clip, using the new Monitor window



has seen more improvements than in others is the editing of sound. Although even the previous version also allowed for 99 audio tracks, there was not much you could do with them apart from basic mixing. This version includes 21 audio filters that enable you, say, to alter the dynamic range of the audio, remove a distracting hum, isolate and fine-tune specific frequency ranges by parametric equalisation, or simulate an acoustically live interior with reverb. All are important features in sound editing for use in video, either for smoothing out inconsistencies in live audio recordings, or creating special effects.

On top of that, web-ready audio allows you to specify the exact amount of downsampling to use for high-quality, low data-rate playback on the web (for example, you can specify 2KHz or 3KHz audio files). And when it comes to full-motion video (with or without sound) for the internet, on

the two Premiere 5.0 CDs you get the Real Media compressor plug-in and Microsoft Netshow 3.0 which enable you to compress internet-ready video straight from Premiere.

If you need to share work with others, or if you need to produce broadcast-quality work and your machine is not sufficiently powerful, Premiere can work as an off-line editor, enabling you to produce a rough cut of your movie, and then

export an Edit Decision List (EDL) which can be used to edit it in a commercial video studio.

The program will take a wide variety of third-party plug-ins and you can apply Photoshop-compatible plug-in filters to video clips for colour balance, brightness, contrast control, blurring, distortions, morphing, and other effects.

Further plus-points include the ability to output videos up to three hours long (individual clips can be up to 2Gb), precise audio-video synchronisation for PAL, NTSC or film, powerful capabilities for searching and sorting video clips with user-defined and built-in database fields, and separate library files for storing clips.

**Panicos Georghiadis
and Gabriel Jacobs**

PCW Details

Price Estimated street price £764 (£650 ex VAT). Upgrade (from earlier versions, or from the LE version) US \$199 (Sterling price TBA).

Contact Adobe 0181 606 4001 www.adobe.com

System Requirements Minimum: Pentium (will not work on a 486), Windows 95/98/NT, 32Mb RAM, 60Mb hard disk space for installation / 30Mb for application, CD-ROM drive, sound card, video capture card, 256-colour graphics.

Good Points Professional. Versatile. Easy to use. Good results.

Bad Points Expensive.

Conclusion Although cheaper products exist, this new version has more features than any other package.

★★★★★

Software

The CyberAngel 2.0

Your very own kick-ass angel to protect your PC against theft and illegal access attempts.

It's a computer user's worst nightmare. You come into the office one morning, only to find that there's been a burglary. Or you come back to your car and find the window smashed in and your laptop gone. Naturally they're insured but how do you replace your missing sales figures, contact details or novel-in-progress?

Most security products have tended to focus either on protecting your hardware with physical locks or alarms, or your data with password authorisation. But Computer Sentry Software (CSS) says that its security product, The CyberAngel, can help keep both your data and your hardware safe, simultaneously.

Setting up The CyberAngel took only minutes. It comes on a single floppy, so it won't take up valuable space on your hard drive or tax your system resources. Once you've installed it, simply enter your registration information, select a password and make a note of the password and authorisation codes that you have chosen. Stash these in a safe place far away from your PC, connect to the internet and your details are whisked away to the CSS Monitoring Bureau. The CyberAngel appears neither in your startup menu nor in your directory listings, so a thief will never know that it is there.

You're given the option of either a prompted or unprompted password, so you just have to make sure you remember when it's armed. Once The CyberAngel is armed, however, you must enter your password every time you start the machine or try to log on as another user. You can also set it to protect your PC if you have to leave your desk for a while.

Attempted entry

If someone tries to get into your machine without the correct password, The CyberAngel immediately turns off your modem's speakers and calls the Monitoring Bureau, who then notify you of the attempted intrusion, either by fax or email. It then locks your communication ports so the thief cannot get into your online or banking accounts. The product also works over a network internet connection, as well as protecting against someone dialling into your PC.

You are given three chances to get the password right and if you don't succeed (or try to cancel it and open up another program), you'll be notified by CSS. If this isn't enough security for you though, you can set it to immediately lock up the mouse and keyboard so that no-one can get into any of your other files or programs.



Left
Someone's knocking... will CyberAngel let them in?

Below, left An alert will be set within two minutes

also asked me how I wanted to be notified in the event that my PC contacted them.



When I tried to "break into" my own PC to test the service, I was notified by email of the intrusion within two minutes. Of course, this is not going to be very helpful if you get into the office and find an empty desk, and neither is a fax notification timed at 3:00am going to do you a huge amount of good. But it will help you track down the culprit if you discover that someone has been using your computer after you have left for the day, or has been dialling into it from outside the network. It will also be a comfort to know that even if the thief has your notebook, they won't be able to look at any of the information in it. This can not only save you from personal harassment and further burglaries (if they find out where you live) but even industrial espionage, which CSS says is on the rise.

PC-watch

The CyberAngel also offers a way for you to contact your PC "from beyond the grave", as it were. If the thief ever uses your machine to access the internet, The CyberAngel immediately contacts the CSS Monitoring Bureau, which can then pinpoint the exact position of the machine.

To test this, I rang up the monitoring bureau to say that my PC had been stolen. The staff were extremely helpful and friendly, telling me exactly how I should liaise with the police. They

I then proceeded to break into the machine again and, just 20 minutes later, received a phone call from the bureau telling me that the PC had been accessed at an IP address owned by VNU. They then gave me VNU's address and phone number and offered to ring the police to tell them to try to recover the PC. Because they knew this was a test, they gave me the street address and phone number — but they don't recommend trying to confront the thief yourself.

Peace of mind

I was extremely impressed with The CyberAngel's service. Of course, you will have little chance of recovering your PC if the thief doesn't go online, but CSS says that many PCs are recovered after they have been sold on — sometimes to legitimate businesses, which get a big surprise the first time they hook them up to a modem. The CyberAngel might appear pricey but it will certainly give you peace of mind.

Susan Pederson

PCW Details

Price £69.95 (includes one year of monitoring) (£59.53 ex VAT); 3-year package, including monitoring, £139.50 (£118.72 ex VAT).

Contact CSS 0800 7834655
www.cyberangel.co.uk

System Requirements Windows 95 or NT, internet connection.

Good Points Quick, efficient notification. Easy to get set up.

Bad Points No chance of recovering the PC if the thief doesn't go online.

Conclusion A thorough product that gives you peace of mind.

★★★★★

Software

Intuit QuickBooks 5.0



The number one accounting package gets bigger and better — and there's no jargon to wade through.

QuickBooks is a step up from Intuit's personal finance manager Quicken. It is a fully-blown accounting package with a sales ledger, purchase ledger, invoicing, budgeting, VAT handling and so on.

The difference between this and other accounting packages is that Intuit has done everything it can think of to free QuickBooks of the kind of accounting jargon and arcane requirements of double-entry accounting which most people find incomprehensible. The result is an accountancy package that is easily understood by anyone. It grows with your business, too.

Various versions are available. For novices or small businesses there is Basic Accounting. As your needs develop you can graduate to QuickBooks Accounting and then Accounting and Payroll. As the name suggests, Basic Accounting includes all basic accounting functions, from invoicing to bill payment and VAT reporting and budgeting. The other programs have the same look-and-feel but include additional features needed by the larger business.

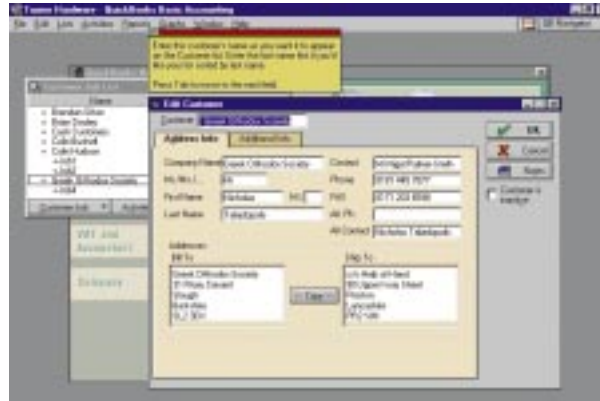
Over the years since it was first released, as an "anyone-can-do-the-accounts"-type package, QuickBooks has managed the near-impossible job of becoming easier to use while adding new accounting features. QuickBooks 5.0 is no exception. There are over 20 new features.

Better customisation and usability

Probably the most significant is the improved customisation. You can customise forms to create multiple invoices, statements, and other forms. You can control placement of fields, columns and a logo by selecting and moving them with your mouse, and you can resize fields, columns and more.

There's a new word-wrap feature, which may seem a pretty basic introduction but allows you to add long, paragraph-style descriptions on forms for the products and services you sell, or to add a field for legal text, disclaimers and so on.

None of the new features are likely to have you slaving to upgrade, but they do improve usability. For instance, you can now maintain records of all the people with whom you do (and have done) business, but hide the details of those who are "inactive". This can apply to customers, vendors and employees and lets you maintain a complete record without clogging up your lists with those who are no longer current.



Left & below, left The lack of accountancy jargon makes QuickBooks easy to get the hang of

Another neat feature is the ability to attach notes to your vendor files. These let you date-stamp conversations, letters and so on, providing you with a complete overview of your business transactions with customers and staff.

Make sure the particular features you want are in the

version of QuickBooks you buy. Inevitably, there are features missing from Basic Accounting: there's no integrated contact management module, no to-do list maker, no facility to perform mail-merge, no job costing or budgeting. If you want these features, you'll have to turn to one of the other packages in the QuickBooks family.

All versions are single-user. QuickBooks can be installed on a network but can only be accessed by one user at a time. In the US, QuickBooks Pro 6 is equipped for multi-users so that data can be shared among employees.

In the family business

The QuickBooks family is an excellent introduction to business accounting and could pay for itself with reduced accountancy costs. Serious efforts have been made to limit accountancy-speak and it is easy to use. The CD-ROM version contains an Overview of how QuickBooks works. A bonus, too, is a 60-day unconditional money-back guarantee. And all QuickBooks programs are Year 2000-ready.

My only complaint is that it wouldn't install under Windows 98 (it caused the computer to hang) but it installed without trouble on a 486 running Windows 95.

Paul Begg

Basic Accounting contains 75 pre-designed reports and graphs (the number increases to 106 with Accounting and Payroll) which you can easily customise to your own needs. Using these reports and graphs you can analyse how your business is doing. For example, using Reports you need no more than a mouse click to produce a list of all the unpaid bills from a specific vendor.

Navigator shows you the way

The route to and through everything that QuickBooks has to offer is the Navigator. Down the left-hand side of the screen is a column of tabs showing the different areas of QuickBooks: Sales and Customers, Purchase and Vendors, Banking and Credit Cards, and so on. In the centre of the Navigator there are icons giving access to the major activities associated with each area. Sales and Customers would show icons for Estimates, Invoices, Received Payments, and so on. This makes it a simple to get to grips with the inevitable complexities of QuickBooks.

There are many other useful new features, too. For example, you can now hand QuickBooks data to your accountant and continue to use the program while he updates information. When the updated file is returned, QuickBooks will automatically import adjustments.

PCW Details

Price Basic Accounting package £99 (£84.26 ex VAT). Accounting £ 233.83 (£199 ex VAT). Accounting & Payroll £351.33 (£299 ex VAT).

Contact Intuit 0800 585058 www.intuit.co.uk

System Requirements Win3.1/95, 486 or better, 8Mb RAM (16Mb rec.), 25Mb hard-disk space.

Good Points Lots of features. Easy to use. Free of accountancy jargon.

Bad Points Not so bad, but QuickBooks can't be used by multiple users. Trouble with Windows 98.

Conclusion An excellent all-round package and a worthwhile upgrade for existing users.

★★★★★

■ Software

Kai's SuperGoo

Let's face it, goo is good. Here's your chance to delve into dodgy digital plastic surgery.

Realtime liquid image funware is what it says on the box, and that's as good a description as any. SuperGoo turns your photos into runny, malleable images that you can pull, pinch, squeeze and mould into grotesque caricatures. Naturally, this process is most fun when applied to portraits.

Rooms with a Goo

Like its predecessor, Kai's Power Goo, SuperGoo is divided into two rooms. The Goo Room is where you get to play digital plastic surgeon and the Fusion Room is an electronic version of the photofit game where you can make up faces from a selection of different hairstyles, and facial parts from the neck up. You're not restricted to square images, they can be any aspect ratio. You can now also zoom in and out and pan around the image by holding down the space bar to make use of a grabber tool.

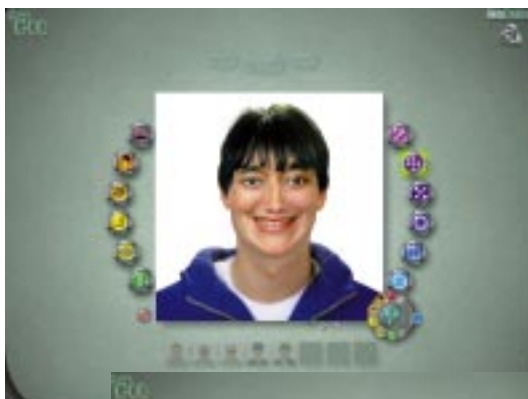
Anyone who's used other Kai products will feel at home with the interface. Two palettes (the brushes and effects palettes) are the distortionist's tools. By judicious application of the noise, bulge, nudge, twirl, smudge, smear, gooplicate and ungoo brushes you can make your subjects' eyes pop out of their sockets, ears extend, eyebrows meet in the middle and chin disappear up their, er, nose. You now have more control over brushes via two sliders to let you set the size and fluidity of the brush strokes.

Global ungoo

There's now a global ungoo slider to diminish the overall goo-iness of the image; pull it right back and you're back to normal. A film strip palette at the bottom of the edit window lets you store up to 64 "Goovie" keyframes which you can play back and save as an AVI or Quicktime movie. You should soon be able to save Govies as animated gifs, although currently only static gifs are supported.

The effects palette provides nine overall effects: zig-zag, ripple, twirl, zoom-rotate, stretch, squeeze, spike, vortex and wave. They work rather like dynamic filters. Each has two or three sliders which constantly cycle from minimum to maximum values and can be stopped at any point. You get the effect you're looking for by stopping each slider at the appropriate moment, then clicking to accept or decline the result.

Lastly, you can add a block of text to your Gooed image, although the options are fairly



Left Make weird friends in SuperGoo's Fusion room. This is the result of the mutate button set midway between male and female

Middle Now anyone can work for Tefal. This is courtesy of Supergoo's stretch effect

Bottom Text control could be better. This montage shows the text palette and results

mouth, head and accessories. Having selected the feature you're interested in you can use control buttons to move through the available options or pull up an image library. There's a gender selector, too, so now you can see what you'd look like with female ears! And, there's a random face generator for those who prefer to let the machine make the choices.

Gender bender

One of the most impressive things about the mutator palette is the way it materialises when you place the pointer over its dimmed outline; as if it were surfacing from a shallow pool. It looks like an old-fashioned phone dial and the six facial feature buttons are arranged in a circle. There's a gender slider on the right and the centrally-mounted mutate button. You can toggle the facial feature buttons depending on whether you want to stick with what you've got or make a change, then position the gender slider to bias towards male or female features, hit the mutate button and wait for the results. When you're through messing up other people's faces you can have a go at some of your own using the clone brush, although in comparison with using the library images, cloning attempts can look pretty crude.

SuperGoo is great fun. The question is, when the novelty has worn off, is it good for anything? If you want to create photorealistic cartoon images this is the only way to do it, and if your aim is just to have a laugh you won't be disappointed.

Ken McMahon

limited. Text sits on a separate layer, so it's not affected by any of the goo brushes or effects you might subsequently apply. And you can set only one text object; subsequent clicking of the text box merely lets you edit the existing text.

Face furniture

In the Fusion Room, you create faces by combining different facial features. Power Goo would let you do this with your own images, but SuperGoo provides an entire library of facial bits for you to create composite characters. Each feature is on a different layer so it can be moved, scaled and otherwise manipulated independently.

There are a number of ways to approach the task. The face palette has six buttons which control the facial features: hair, eyes, nose,

PCW Details

Price £58.70 (£49.95 ex VAT)

Contact Computers Unlimited 0181 358 5857
www.metacreations.com

Good Points Great fun. Superb interface. Unique package.

Bad Points Cloning brush control and text features could be better.

Conclusion Very much a niche package for caricaturists and jokers.

★★★★★

Software

Visio IntelliCAD 98

Design on a budget with the advantages of AutoCAD. But watch out for the eccentric interface.

IntelliCAD comes from the people who brought us Visio the easy, smart-shape-based, "drawing package for those that can't draw." But the resemblance ends there. This is not an "easy" technical drawing program but a Computer Aided Design (CAD) package that is aimed squarely at the professional user or, to be more precise, the AutoCAD market. This departure from the "house style" is explained by the fact that after an exciting round of adventures starring Autodesk, IntelliCAD's developers and the Federal Trade Commission, Visio finally acquired the developers (Boomerang Technologies) and the IntelliCAD product. Autodesk's anxiety to acquire the product is understandable, as IntelliCAD boasts

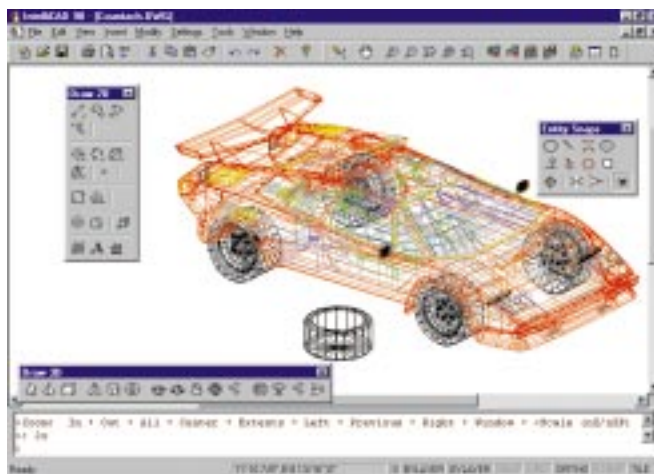
compatibility with not just the AutoCAD .DWG file format up to release 14, but also the menu, script and symbol files, the AutoLisp and ADS development systems as well as Microsoft VBA.

Mix and match

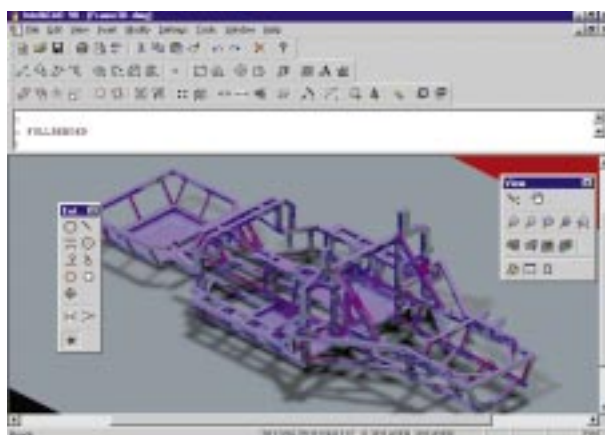
Having established its similarity to AutoCAD, it is no surprise to find that it looks rather like it, too, with similar Office-style toolbars and the familiar 3-line text entry window. Although this is a pure AutoCAD "legacy" feature, it is in fact very useful. You can, if you want, dispense with most of the buttons and menus by typing in commands.

Although this is fine for grizzled CAD veterans, those used to the cossetting of graphical user interfaces will probably prefer to use the buttons. In this case, you can mix and match, and still type numeric values into this box when needed. Its unique selling point is that it always has the keyboard focus. You don't have to click, tab or press a F-key, just type away and follow the prompts and it acts as a "one stop shopping" point for nearly all dialog input. If you really find it irksome, or need the screen space, you can shrink it into the status bar and use the pop-up context menus for selecting options.

Having covered one CAD essential (precise numeric input) we turn to another. Entity Snaps let you attach points, such as the start of a line, precisely to points on other objects: end points or midpoints of lines, centres, quadrants or tangents of circles, and so on. Once again the developers have followed the AutoCAD standard of having flexible snap arrangements that can either be



Left 3D entity creation and editing



Below, left Rendering: limited options but still impressive

implemented on a "running" basis (there until you turn them off) or as a one-off.

There are a couple of important differences in this version. On the plus side, IntelliCAD is fully MDI. In other words you can open more than one drawing at a time, a feature that has hitherto eluded AutoCAD's developers. You can also open different viewports on the same drawing, combining, say, an overall view with a zoomed detail or two angles on a 3D model.

A variation on this is working in Paper Space, combining multiple views for printing out on the same sheet together with titles and notes. On the minus side, there is no support for TrueType fonts, just the bundled plotter fonts — a rather odd piece of retro design.

Other dimensions

There are a few other disappointments. Hatching (filling with a pattern) is awkward and not "associative". Unlike ordinary drawing software, the fill and outline remain separate objects. Dimensions, however, are associated so that if

you scale an object together with its dimension lines, the numeric dimension text will be updated. There's an Explorer-style interface for managing layers, views, line or text styles and user-defined co-ordinate systems.

Three-dimensional

functionality is a rather mixed bag. You can draw lines, arcs and other shapes in 3D and there is also a range of "primitives" such as spheres, cones and boxes. Digging deeper reveals more commands which are not included on the default menus and toolbars. These include tools to create surfaces by revolving or extruding shapes and stretching meshes between connected 3D lines or curves. There's also an impressive built-in rendering engine with a small but effective range of options for lighting, shadows and surface materials. What I did find limiting was the inability to add or subtract 3D shapes, for instance to "drill a hole" in a solid.

Other complaints were that it seemed prone to crashing (admittedly on a beta Windows 98 installation), the documentation was patchy and the scroll bars were a law unto themselves. It did, however, support a wheeled mouse rather well, with the wheel short-cutting to the snap menu when pressed and zooming in and out when rotated. But despite the drawbacks, and although it doesn't have the full 3D power of the £3,000-plus AutoCAD, it's a tempting budget alternative and completely outguns the underpowered and overpriced AutoCAD LT.

Tim Nott

PCW Details

Price £292.58 (£249 ex VAT)

Contact Visio International 01372 227900
www.visio.com

System Requirements Windows 95 or NT, 486/66, 16Mb RAM, 50Mb disk.

Good Points All the advantages of the AutoCAD standard and better featured than AutoCAD LT.

Bad Points Newcomers will find the interface eccentric and the learning-curve steep.

Conclusion Be afraid, Autodesk. Be very afraid.

★★★★★



Eudora Pro Email 4.0

Eureka! Eudora gets even better with lots of new features and an advanced filtering function.

Like the video recorder and the microwave, email is one of those things that, once you've used it, you can't imagine how you ever lived without it. Suddenly you can contact your work colleagues and your friends in a few lightning keystrokes. You can become so used to being in instant contact with people that you feel bereft if you're away from it for too long. But like anything else, email has its problems. Get online

easily. It also features the message preview pane that lets you look at the contents of a message without having to open it. You get the new "Cool-bar" toolbar, too, which can be customised and moved around. The icons used on the buttons still take a bit of getting used to, though. Virtually every type of graphic is supported, letting you display the image within the body of the message rather than having to open a separate application to view them.

Getting set up with Eudora is child's play. The Setup Account Wizard walks you through the process, even helping you to

each other without having to detach and launch the sound files separately.

One of Eudora's most impressive attributes, and the one which sets it apart from the rest of the pack, is its filtering ability. This advanced filtering function lets you create complex rules and actions to deal with incoming mail. Want to automatically send everything containing the words Press Release to a certain folder? Just click on the new Make Filter command to set it up. You could even set it to delete messages from a certain person or domain name, or even get it to zap messages that contain offensive words, including "WIN, WIN, WIN". A Stationery function is included that lets you set up various message templates which could then

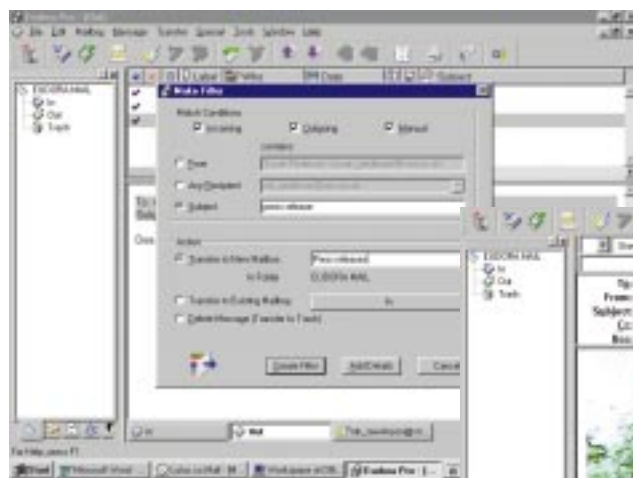
automatically be sent out in response to incoming messages that meet predetermined criteria.

Eudora 4.0 is compatible with most internet attachment protocols in use today, including MIME, BinHex and UUENCODE, and uses PGP (Pretty Good Privacy) encryption to protect your messages. It also features McAfee's VirusScan, which checks all your downloads for potentially harmful viruses,

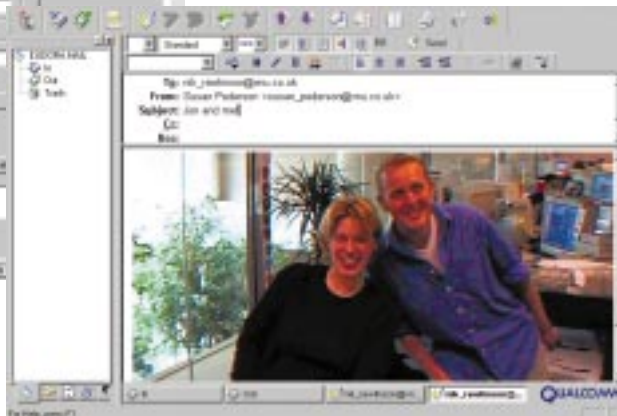
as well as Aladdin's Stuffit plug-in, which compresses your attachments to keep your online time to a minimum.

Eudora Pro's price has come down a lot in the past year, so you don't have to be a seriously dedicated user of email to check it out. It can help you get your online life in order with a minimum of fuss, but even if you have a few problems figuring it out, you also get free telephone support for 90 days and unlimited online help.

Susan Pederson



Above Eudora can automatically stream certain emails straight into their folders



Right Charm your mother and save online time with compressed attachments

and suddenly hundreds of people that you've never set eyes on want to talk to you. Go away for a week and you may come back to face a hundred-or-so messages, all desperately needing your attention. Wouldn't it be great if you had an email program that acted as your own personal secretary, sorting the wheat from the chaff?

At this point, anyone who uses Qualcomm's email package Eudora Pro is already sitting back and smiling smugly. Eudora's clean interface and formidable filtering capabilities have already won over thousands of converts and version 4 is likely to earn it quite a few more.

Cool bar

There are a number of improvements over version 3. You can now sort your mailbox by clicking on the column headings or dragging them around to rearrange their order. It also allows you to use Light Directory Access Protocol (LDAP) servers to access email directory databases like Bigfoot.

Eudora Pro 4.0 doesn't have a drastically different look to version 3.0. You still get the multiple-pane interface that groups the windows you use most often into special container windows, letting you get at them quickly and

import configuration information from your other email applications. It's almost just a matter of typing in your mail server and your password and you're ready to go.

Unlike some other email applications, Eudora Pro lets you manage email from multiple accounts (even CompuServe). As long as the account uses a POP3 or IMAP4 server, Eudora Pro can handle it. Eudora can also use multiple signatures to personalise your messages, as well as organising multiple address books. It even works in the background to silently check your messages, however often you like.

Little extras

You need not spend much time on the little extras with Eudora Pro. For those who hate being caught out on their vocabulary, it features a built-in spell check. It just focuses on the message, rather than on the email addresses as do some other spell checkers. You can also simply drag and drop files to attach them to messages or else use the facility to reorganise your mailbox and folders. There is also a host of plug-ins with Eudora, including Qualcomm PureVoice, which lets users exchange actual voice messages with

PCW Details

Price £29.99 (£25.52 ex VAT)

Contact Roderick Manhattan Group
0181 875 4444 www.qualcomm.com

System Requirements Windows 3.1, 95 or NT 3.51 or greater. Winsock 1.1 or greater.

Good Points A cinch to set up and get going.

Bad Points It may take a while to learn the icons and figure out keyboard shortcuts.

Conclusion If you use email a lot, this one's for you.

★★★★★

Software

Optio

Deal with that dosh (or lack of it) with this easy-to-use long-term financial planning package.

It takes a confident person to say that they are in total control of their personal financial affairs. There is always the worry that some opportunity may have been overlooked, some loophole left unplugged, some provision left unmade. What you need is a financial advisor. Well, no, actually you first need financial understanding and this is where OPTIO comes in.

OPTIO is a financial planning package to help you manage your long-term financial plans: assets such as your home and property, and your long-term financial commitments like mortgage or school fees. It also helps you to decide whether you have made adequate provision for your pension and even whether you are carrying enough insurance. It is not an accounting package, so it won't help you keep records of your day-to-day finances. Neither is it a financial adviser, so it won't recommend specific investments (although it claims to offer tax-saving tips).

Affairs in order

What it does is get your affairs into some semblance of order before you talk to a financial adviser. It does this by subjecting you to detailed interrogation by its on-screen Factfind questionnaire (or interview). This is exactly what a financial adviser or a salesman would do, too, except that you can do it in your own time and you get to keep the answers and the analysis.

You use OPTIO by creating your personal file. It's a little mystifying that in a program intended for personal use you are obliged to enter the name of your employer. It's also annoying to find that if your name has fewer than eight characters you'll have to employ a pseudonym — an inauspicious start.

The Factfind interview is divided into seven sections. "Introductions" covers your basic personal details including your family, your health, and your dependents. "Career" covers details of you and your partner's current employment and other sources of income. "Assets" deals with property, investments, mortgages and other loans you have made, while "Borrowings" covers mortgages and any other long-term loans.

"Protecting Your Family" gathers details of any insurance policies you or your employer may have taken out against illness or disability. It also covers life insurance policies and any death-in-service benefits that may be provided by your employer. "Monthly Cashflow" covers your monthly expenditure and longer-term spending ambitions. The final section, "Planning Your Retirement" keeps track of any pension and



Left The main screen takes you to any of its modules
Below, left Calculate individual parts of your financial plan and consolidate them into a comprehensive statement

school fees. If the answers are negative, you know you need to talk to a financial adviser.

When OPTIO has performed its financial calculations, it prints out a series of reports containing almost all the information likely to be required by the sellers of financial products.

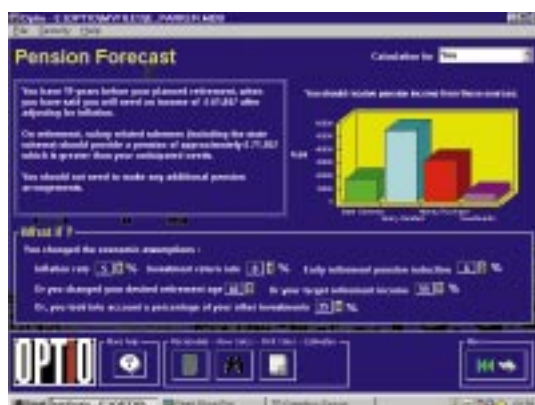
This will considerably reduce the amount of time that you'll need to spend with your financial adviser. If they use OPTIO, too, you can even produce your data on disk for them to open in their program. The reports can be reviewed on-screen except, curiously, for the tax tips.

Family matters

There's a demonstration file for a fictitious family whose details have already been entered so that you can see how the program works and what information it expects to be given. There's also a useful on-line guide to the program's operation, including some general financial advice, supplemented by a 170-page paper version. The publisher plans to update OPTIO with tax and legislation changes when they occur (prices for this service are not yet available).

There are not too many of this program type around, but with the Government apparently easing all of us into private pensions and other long-term financial arrangements, coupled with the recent pensions mis-selling scandal and perceived high commission rates, perhaps this type of program is emerging at the right time.

James Taylor



retirement saving arrangements you may have made, including State, occupational and personal schemes.

Probably the most onerous aspect of planning is the initial gathering of the information, although the OPTIO manual gives some helpful hints. You'll need things like school or college fees, payslips, building society statements, property valuations, share certificates, mortgage statements, insurance policies, bank statements, and so on. You don't have to gather and enter all this information at once as you can come back to the questionnaire whenever you wish.

You can open as many files as you like, so you can prepare plans for individual members of your family or partners in your firm. You can also keep different data for yourself while you're working things out, perhaps to compare the total benefits provided by a personal pension to those provided by an occupational scheme.

End result

When you've finished entering information you can analyse your financial position, using four diagnostic programs, or calculators. These will tell you, respectively, if you can: afford to retire, afford to be ill and whether, indeed, your family can afford for you to die, and whether you can afford

PCW Details

Price £52 (£44.26 ex VAT)

Contact Optio Developments 01932 224002
www.optio.co.uk. (Demo disc available by phoning 0181 914 9370.)

System Requirements Windows 95, 486 processor, 8Mb of RAM, 12Mb hard-disk space, CD drive.

Good Points Ease of use. Comprehensive questionnaire. Practical guide.

Bad Points The time it takes to collect and enter the data, but this is common to all such programs.

Conclusion Well-featured personal finance planning package, indispensable to anyone concerned about their financial future.

★★★★★

Software

Livepix 2.0 Deluxe

Look lively! Here's an easy way to home-edit digital images on your PC, without banks of RAM.

Livepix 2.0 is a home photo editing package based on Kodak's FlashPix graphics file format. FlashPix lets you edit digital images on your PC quickly and easily — often an impossibility with conventional graphics file formats, which can be so large as to slow your PC to a snail's pace.

Rather than go for a major overhaul, with version 2 Livepix has added a number of much-needed features as well as a few add-on extras. The interface looks the same as it did before, simple and unimposing with a toolbar on the left and gallery palette on the right. This appears in a browser format when you start up the application, offering a selection of pictures and prepared projects from the CD. The latter are divided into categories (such as babies, holidays, school) and offer a reasonable set of templates with which to experiment. You can organise your own pictures and projects into digital albums in this way.

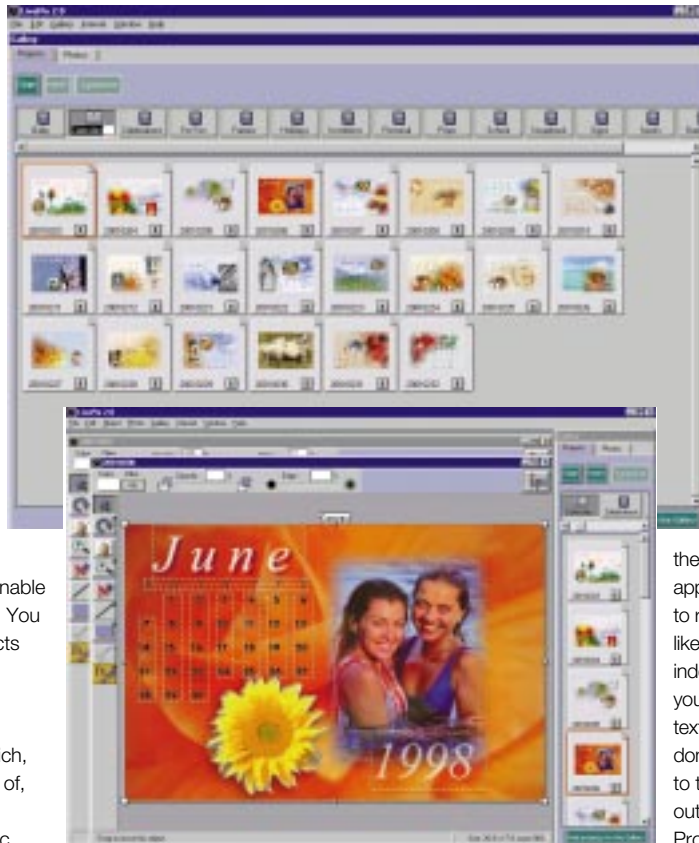
Filter facts

Virtually all the new additions are filters which, as version 1 had no filter support to speak of, can only be a good thing. Top of the list is sharpen/blur, closely followed by automatic colour correction. Both of these are such a basic necessity that to leave them out would have been suicidal. They both do a good job. Sharpen/blur provides a dialog box with slider and two nice, big, "before and after" preview windows which you can zoom and pan.

Livepix 2.0 now provides support for plug-ins. To prove it, you're provided with Xaos Tools Paint Alchemy Lite which is a low-calorie version of an excellent suite of special effects filters. This will give you a feel for what can be achieved. But if you really want to go over the top with digital effects you'll need to invest in the full version, or take a look at any of the Photoshop-compatible plug-ins on the market. Most of these should work with Livepix 2.0. (Applications developers often claim that their software supports Photoshop plug-in filters but in practice this depends on how closely they've stuck to the rules about how they should be written).

Cloning with sheep

Another big hole in the Livepix repertoire to be rectified by version 2 is cloning. The clone button is cutely represented by a herd of sheep and clicking on it opens the cloning palette. Here you get a view of the image to be cloned and four buttons for panning and zooming, selecting the source area to be cloned and the cloning brush



Left A good selection of calendars comprises part of the template gallery. You can also create your own digital albums

Below, left Objects, rather than pixels, make for faster and easier editing

would be gone forever unless you put the text on a separate layer, a process which adds to the file size and slows everything down. Even with layers, if you want to edit existing text, chances are you

have to start over again and, the more special the effect you have applied, the more work you will have to recreate it. But Livepix treats text, like everything else, as an independent editable object, so all you need to do is double-click the text object, change it and you're done. This makes a huge difference to the ease with which you can try out different techniques.

Professional retouchers have had to wait until relatively recently for this kind of versatility to be incorporated into Adobe's market-leading Photoshop 5.0.

Two minor criticisms. First, the lack of scroll bars is infuriating. When the image size or zoom factor allows you to display only part of the image, you'd expect to get scrollbars to enable you to display the rest. But no, you have to use the pan tool to grab and pull it around the screen and this is far from ideal. The second is that the dust and scratches filter that was promised was not present in the version I received.

Ken McMahon

itself. Three sliders at the top let you select brush size, pressure (which is in fact opacity as there is no support for a pressure-sensitive tablet), and scale with which you can clone the source bigger or smaller to its destination.

Having corrected its more glaring shortcomings Livepix is now better placed to compete with the growing number of home digital darkroom applications. It's not as much fun as many of the niche products like Kai's Photo Soap, or Professor Franklin, it's interface isn't as well designed as that of Photodeluxe, but it has the trump card which is the FlashPix format.

Look, no layers

Although other applications support Flashpix, it's not at the heart of the way they work. Livepix provides the opportunity for home users (who may not have the luxury of bank upon bank of RAM) the opportunity to do the kind of tricks that hitherto have taken far too long to be worth the effort. Also, its object approach means that making changes is a much simpler undertaking than it would otherwise be with a pixel-based package like PhotoDeluxe.

Take adding a drop shadow to text as an example. In a pixel-based package, once the text and shadow were created, any detail "underneath"

PCW Details

Price £39.99 (£34.03 ex VAT)

Contact The LivePix Company 0121 236 1990
www.livepix.com

System Requirements Windows 95, NT or Apple Mac System 7.5.3.

Good Points Fast. Easy-to-use, uncomplicated, interface.

Bad Points Uninspiring. Let's have some scrollbars!

Conclusion Does the job, but you could have more fun elsewhere.

★★★★☆



Software

ZipMagic 98

Why bother to unzip files and folders when you can view 'em and use 'em with a zipless action?

Zip files are everyday application or data files that have been "zipped", or compressed, to save space on your hard disk or in your email. Zipping is one of several proprietary systems, and is probably the most used. Similarly, ZipMagic is one of several programs dedicated to zipped files, although given the facilities in this version, it will probably become the most used.

The problem with zipped files is that you have to unzip them to see what's inside. Prior to ZipMagic, this meant decanting them into another directory. ZipMagic puts a stop to that by treating zipped files as if they were ordinary Windows folders. You can see what's in them, you can access data files and you can run programs. You could do this in ZipMagic 1.0 but ZipMagic 98 adds a lot of extras.

The ZipSurfer plug-in for Netscape Navigator and Microsoft Internet Explorer lets you download, view, unzip and install Zip files directly from within these browsers, automatically. Similarly, the new ZipMail plug-in will add your attachments to your emails without your having to compress them separately. This works with



Microsoft's Inbox, Exchange, Outlook 97 and 98 as well as Eudora Light, Pro 3.0 and 4.0. It also works with Windows Explorer, automatically compressing and sending files without even opening your email program, by using the "Zip and Send To" command integrated into Explorer.

The new ZipMagic 98 wizard gives guidance in zipping, unzipping and making self-extracting Zip files and there's a ZipTools program to view the contents of Zip files, open other compressed files, and access advanced functions. If it's

ZipMagic 98's operation is made as foolproof as possible

simplicity you're after, just add a .ZIP extension to any ordinary folder and it's zipped. You also get automatic saving of large files over multiple floppy disks automatically, which is useful for backups or sharing Zip files with others, not to mention the creation of self-installing program disks.

James Taylor

PCW Details

Price £34.69 (£29.53 ex VAT)

Contact Atlantic Coast 01297 552222
www.atlantic-coast.com

System Requirements Windows 3.1, 95 or NT, 8Mb RAM, 7Mb hard-disk space.

Good Points Simple. Comprehensive. Seamless.

Bad Points None.

Conclusion Every possible feature for compressing and decompressing files and folders, plus transparent automatic operation.

★★★★★

Serpent Software Chimp!

Chimp! is an on-screen notes system that will relieve your monitor of its layers of yellow slips.

This is nothing to do with monkeys or zoos, but if your monitor is anything like those in the PCW office and finds itself constantly wearing a cardigan of Post-It sticky notes, you might like to take a look at this snazzy bit of shareware.

Installing from a single floppy, this package is tiny and (almost) perfectly formed. Dropping itself into your system tray, Chimp! is available at the click of a mouse and the configurable on-screen appearance can be set to match the rest of your

desktop. The idea is simple. Instead of making your notes on paper or, worse, in multiple Notepad or Word documents, why not put them all in the same place?

Take away the need to save by making it an automatic process, because you don't need to save your handwritten notes and what you have is the computer equivalent of a pocket book. More pages can be added when needed, with each displaying a tab poking up over the other sheets. The tab names are user-definable for easy location.

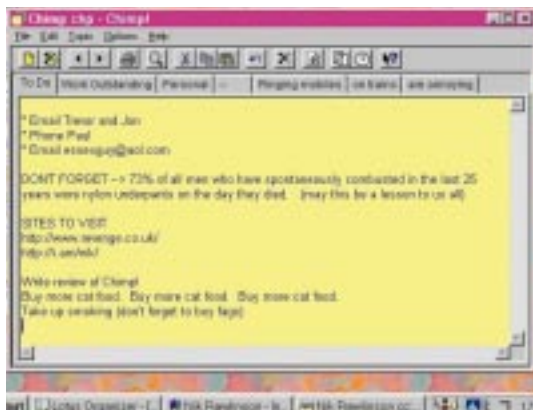
A nice touch is the ability to visit web sites directly from your notes. Highlight the address, click the appropriate button and Chimp! will launch your browser and point it at your selected destination. The format is fairly strict, though; addresses must start with <http://> as just an initial www will not do. We were also disappointed that the word-wrap feature was not directly accessible from the drop-down menus but

When Notepad just won't do, use Chimp! to organise your memos

hidden away in the Options dialog box. Your notes can be automatically date and time stamped with the click of just a single icon so you know exactly when you wrote them.

Perhaps the best thing about this package, though, is the fact that you can just visit the Serpent Software web site and download it. Removing the 90-day time limit requires a simple code, obtained upon registration, that can be paid for by cheque or credit card or charged to a CompuServe account (although this will be charged in \$US).

Nik Rawlinson



PCW Details

Price £10 (\$15)

Contact Demios 01923 444855
www.demios.com/serpentsoft

System Requirements Windows 95 or NT 4.0.

Good Points Easy to use. Saves on sticky notes. Petite.

Bad Points Restrictive web-address rules.

Conclusion A cheap and cheerful way to keep your notes in order.

★★★★★

■ Software

2 YEAR
TEST

Borland Paradox 5 for Windows

A wonderful Windows database and superb programming language, but it's not for the novice.

If my memory serves me correctly, Paradox was the first database to move to Windows from DOS. Borland was keen to get the product widely adopted and so priced it aggressively. I was looking for a database, and never having used one before, I opted for Paradox because it was Windows and cheaper than anything else. Since then I have had a love-hate relationship with this powerful piece of software, which changed my career and has led to many very late nights.

I upgraded with each new release but carried out most of my development work using v5.0

which, despite being 16-bit (we had to wait for v7.0 to reap the benefits of 32-bit computing) was then leagues ahead of anything else.

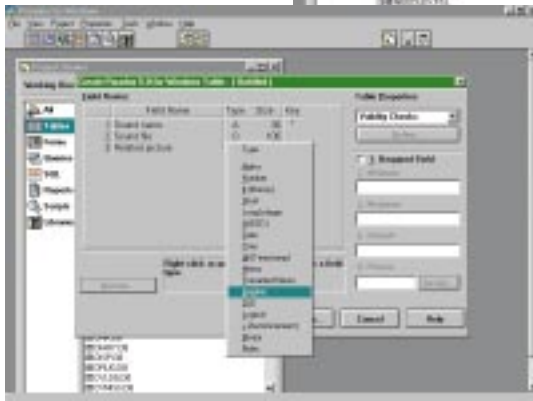
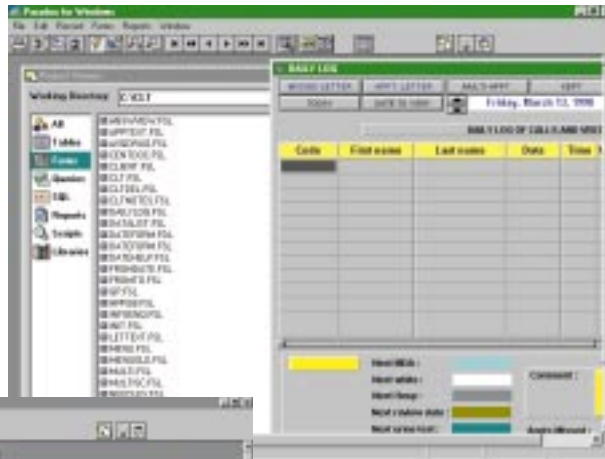
It was with v5.0 that Borland attempted, and failed, to make the product more user-

friendly. Two new buttons appeared on the toolbar, Experts and Coaches. Experts was an attempt to automate certain fundamentals like form or report creation, while Coaches... well, the less said the better. Paradox was, and always will be, for grown-ups only.

Manual labour

The programme came with good documentation in the form of three manuals: a short Quick Start, a comprehensive User's Guide and the even thicker Guide to ObjectPal. Like most computer users I tend to dip into manuals rather than read them, and these have certainly proved to be well laid out, as I can usually find what I need quickly enough.

I have used Paradox 5.0 intensively over the past two years on a 486 DX66, with no major problems, but have encountered some minor irritations. It occasionally locks up, which is very annoying as this entails rebooting the computer; I



Despite the occasional lock-up, Paradox is a well-designed and generally stable product

have recently downloaded a small utility to overcome this problem. In Form Design mode there are sometimes difficulties when Paradox seems to "forget" which object I am currently working with. This is a programme that likes lots of memory, despite the claim that it will run in 6Mb, and I could probably have done with more than my paltry 20Mb.

Attention deficit

On the plus side, this has been a very well designed, robust and highly featured product that has suffered from a lack of attention by its owners. It outstrips Access in almost every department and could have been quite amazing if the power of Microsoft had been thrown behind it. Borland never seemed to be sure who it was aiming it at: professional developers or first-time users. As it was, users of Word or Excel could not import directly from Paradox for Windows tables, which probably marginalised the product further

than it deserved.

Undoubtedly the strongest features of Paradox are the wide range of data types available and the Pascal-like ObjectPal language used for development. The data types allow users to store almost anything in a table, from video clips to binary code, and then to apply powerful indexing. ObjectPal is a very clear, powerful and well-featured language that takes little time to grasp and start using.

Unlike Access, Paradox has never used macros, instead requiring users to write all the code required. I am not convinced that recording macros is really very useful or even teaches the user much. There is still a huge amount of information, sample code and other Paradox stuff available worldwide, accessible on the internet, although this now seems to be gradually diminishing as the product goes into decline.

Sadly, Borland, having learned how to successfully implement object-orientated program development using Paradox, turned all its attention towards Delphi which has, of course, been enormously successful. Today, it doesn't even own Paradox, having sold it to Corel which might continue development, but I fear this is unlikely. They make balloons, don't they?

Nick Hazelmore

PCW Details

Price Version 7 is £92.83 (£79 ex VAT)

Contact Inprise 01 18 932 0022 www.inprise.com

Good Points Excellent range of data types and superb programming language (ObjectPal).

Bad Points Steep learning curve, not for the novice. Lack of integration with other applications.

Conclusion An excellent Windows database that Borland dropped in favour of the inferior Visual dBase.

★★★★☆

We welcome readers' contributions to our Long Term Tests section and pay for those we publish. If you've used a piece of hardware or software for some time, write 300-words for hardware or 650 words for software (plus GIF-format screenshot for the latter) and send it on disk in MS Word or ASCII format, to Paul Trueman at the usual PCW address, marking your envelope "Long Term Test". Or email it to paul_trueman@vnu.co.uk.

Forte Agent

An easy-to-use, low-priced, off-line reader to cut down your email and Usenet expenses.

For the SoHo (small office/home office) worker, internet access at BT's monopoly local call rates can become a major expense. One way to keep costs down is to use an off-line reader for email and Usenet. You do all your reading and writing off-line, connecting only to send and receive. Internet Explorer and Navigator have mail programs included, but heavy users will quickly find they need something more capable.

As a Demon Internet subscriber I had been using its clunky and quirky Turnpike software for email, and the better-designed Forte Free Agent for newsgroups. Then Forte released Agent 1.5, which differs in several respects from Free Agent, among which is the inclusion of an integrated email program and improved mail filtering.

Of course, it's not actually free. I downloaded the 1.9Mb self-extracting file from Forte's web site at www.forteinc.com. After Forte has received payment (in my case, online by credit card) it sends you a registration code and the program sets up without trouble. Allow about 4Mb for program files and 10Mb upwards for your data files. For me, the email client alone was a good enough reason to shell out the small sum asked.

Yorkshire pudding

Forte Agent has a useful address book and you can download conversion utilities to import Pegasus and Eudora address books. I use the spell-checker (which works with Usenet mail, too) more as a proofing tool for literals than anything else, as it seems to contain howlers of its own. Type a perfectly correct "Yorkshire" and it flags an error, offering York Shire as a replacement!

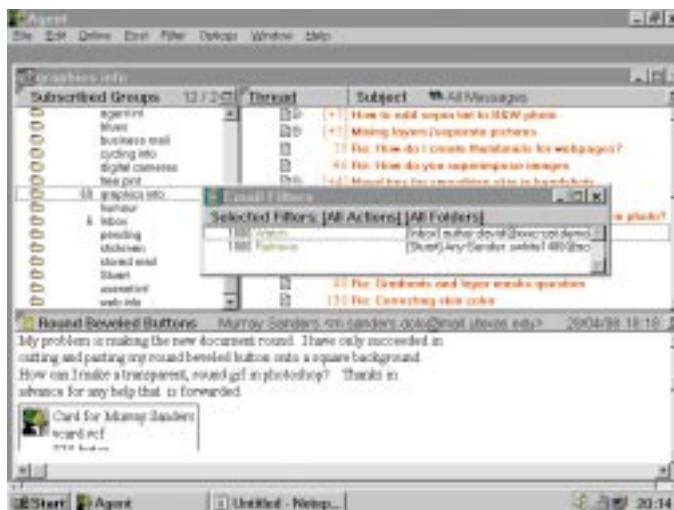
You can apply filters to your email to automatically file incoming messages in chosen folders. So all mail from someone called Stuart, say, could be saved to a folder similarly named. You can apply filters in very sophisticated ways but they must be carefully thought out in order not to affect wanted mail.

I filter all mail on the subject field as follows:

```
subject: ($ | $$ | $$$* $money*
| sex* | porn* | xxx* ) .
```



Off-line readers like Forte Agent can save you valuable time and money on the internet



point it at the file you want to send and it's done. Attachments sent with incoming mail are handled automatically. Just click the "attachment" button and they're displayed or saved as you wish.

Exocet attachment

The downside is that some silly people now attach 200Kb+ of cross documents to their newsgroup missives. The first law of the internet is that the length of a mail is in inverse ratio to the IQ of the sender. Perhaps Forte will soon devise a way to deliver an Exocet as an attachment!

The "global search" is superb. It will search your entire Agent email archives for words or phrases, applying practically any criteria you wish. I dump any information and addresses I think I might need in my "odds and sods" folder and use it as a personal mini Alta Vista search.

Agent complements Internet Explorer well. Set it as the default news/mail program and with a mouse right-click, for instance, you can add a URL from a newsgroup message directly to Explorer's favourites folder. Two programs, and all my internet needs are served. Apart from the Exocet launcher, of course.

David Thorpe

Any mail with any of these in the header is ignored. (Of course, you could equally have these filtered messages filed directly into your "private" folder.)

Filters can also be assigned a priority so that if two filters apply to a message, one is implemented rather than the other. A good source of advice on filtering is the newsgroup alt.usenet.offline-reader.forte-agent.

I like the "sample headers" facility to download only 50 (or however many you choose) headers from selected newsgroups, enabling you to find out what goes on in the "alt.i-like-toejam.lets-share-a-slice.but-hold-the-cow-eyes-please" group without wasting phone time downloading thousands of boring messages. Don't bother, by the way. It's inhabited mainly by spammers.

Sending image, sound and word documents with email is a cinch. Just click on the "attachment" button while typing your message,

PCW Details

Price \$29

Contact Forte (California, USA) 760 431 6460
www.forteinc.com/store/aghov.htm

Good Points Low price. Easy to use. Comprehensive features.

Bad Points At this price, none.

Conclusion Cheap one-stop solution for email and newsgroup users.

★★★★★

■ Hardware

IBM PS/2-60

A classic case, and a collector's item: a 286 PC with MCA bus, two hard disks and extra RAM.

Back in 1987, the PS/2 was almost state of the art and would have cost thousands. Today, the second-hand price is about £20. Originally, it came as a 286, with 1Mb RAM and a large (for those days) 70Mb hard disk. Mine runs still as a 286, but with 11Mb RAM and two 70Mb hard disks. This may seem like small fry compared with today's modern Pentiums, but it can run DOS and Windows so it is at least useful for word processing, DOS games, spreadsheets and so on. It was originally a large tower unit weighing 18kg. Mine is now probably nearer 21kg. But you get the legendary IBM over-engineering for one toughly-built computer.

The MCA-bus motherboard is one of its most interesting aspects and most of the components are located on-board. As it uses the MCA bus, all the IBM expansion cards are software configurable so there is no messing around with jumpers. You simply slot-in the expansion card, boot up with a disk containing the adaptor description files and let it configure itself. Simple. The only disadvantage is that finding new



Today's equivalent from IBM — the Aptiva

expansion cards for these systems is almost impossible. IBM still makes some high-end machines with MCA buses but it is not, sadly, a PC industry standard. You can search for them second-hand, though. Everything about the Model 60 (and all the

PS/2s) was designed with the user in mind and to be easy to service. Swapping floppy disks takes one minute and adding or changing hard disks takes about ten. You don't get this with today's Taiwanese tat!

This PC is an excellent second-hand buy if you are strapped for cash, because many companies are getting rid of them as they can't run the latest versions of OS/2 or NT.

Andrew Deacon

PCW Details

Price Up to around £25 second-hand, for system unit only.

Contact IBM 0990 426426 www.ibm.com.uk

Good Points Build quality. MCA bus. Reliability.

Bad Points Incompatible with most modern clone PCs.

Conclusion A user-friendly classic.

★★★★☆

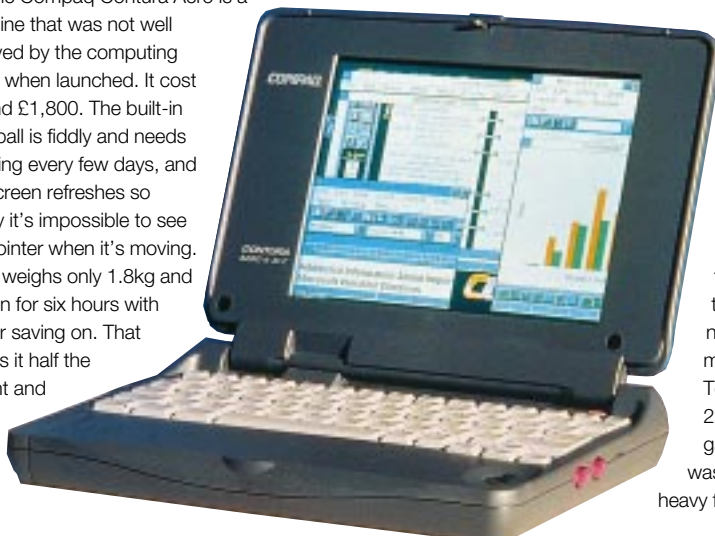
■ Hardware

Compaq Contura Aero

Half the weight and three times the battery life of most modern portables makes this a favourite.

In today's world, where faster PCs are launched every few months, I rarely keep a computer longer than two years. But the exception is the PC I'm using right now. It's a 486/25 with a tiny 160Mb disk and a cramped 640 x 480 mono screen, and it's a portable.

The Compaq Contura Aero is a machine that was not well received by the computing press when launched. It cost around £1,800. The built-in trackball is fiddly and needs cleaning every few days, and the screen refreshes so slowly it's impossible to see the pointer when it's moving. But it weighs only 1.8kg and will run for six hours with power saving on. That makes it half the weight and three



times the battery life of a typical current portable. And while it may be slow by today's standards, it's fast enough and Word 95 still runs faster than I can type.

I've spent the last four days carrying the Aero around Manhattan and I'm typing this somewhere above the Atlantic, having spent most of the seven-hour flight writing-up my visit report. I've tried doing this with a newer and more powerful Toshiba 220CS, but gave up as it was just too heavy for me to

carry around and only had a couple of hours' battery life.

I have a Psion 3a but it's too small to touch-type on and will run neither Word nor Excel. The Windows CE machines look promising but they are too small; the screens are too cramped and they won't run apps like the CiX software, Ameol, that I use for email. The Aero may have its faults, but at the moment there is nothing available with the same low weight and long battery life. So, until there is, I'll be sticking with my Aero.

J Rennie

PCW Details

Price £1,815 (£1,544.68 ex VAT) will buy you Compaq's Armada SB5200S notebook.

Contact Compaq 0845 2704040 www.compaq.com

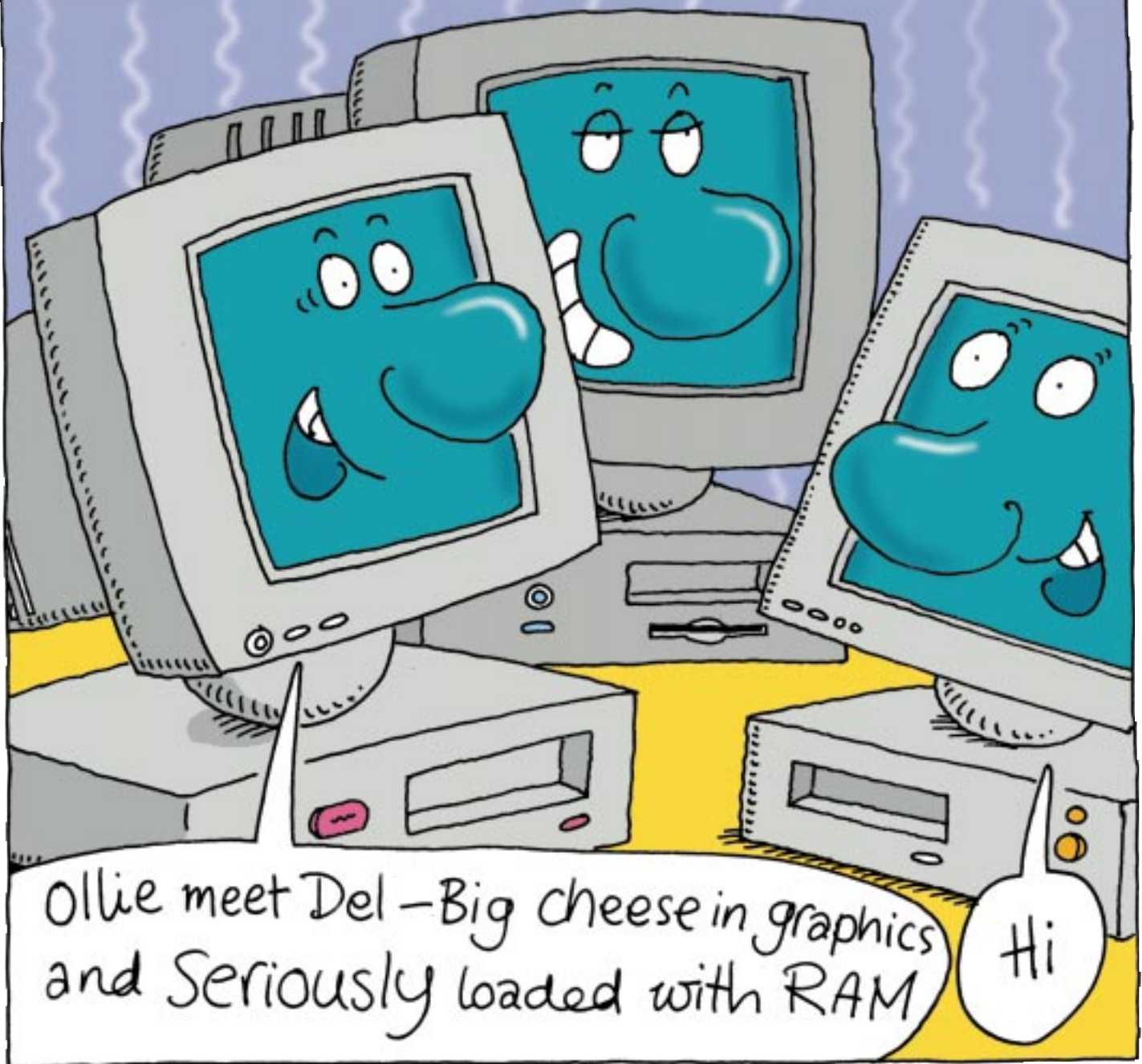
Good Points Light and powerful enough.

Bad Points Slow screen refresh rate. Fiddly trackball.

Conclusion Well worth the hefty price tag.

★★★★☆

Computer networking.....



Cable connections

Even if your small business runs only two computers, you can benefit from networking them together. Terence Green explains where to start, and takes you through the ins and outs of setting up a simple but effective network.

If you have two or more computers in the same location, then you can save time and money by connecting them (otherwise known as networking) with cable in order to share files, programs, email, printers and other peripherals.

Even networks consisting of only two computers can benefit, because single copies of applications and lone printers can service both systems. As an ethical aside,

the ability to save space by storing only one copy of an application should not be exploited in order to avoid payment for multiple use of that software.

Networking splits into two categories: either you have a server or you don't. In the latter case, all computers on the network are equals and we have what is known as a peer-to-peer system. Nearly all modern operating systems support peer networking.

ILLUSTRATION by Trevor Dunton

Server-based networks (sometimes called client/server networks) are more reliable, perform better and generally keep your data more secure. Windows NT Server and Novell NetWare are examples of server operating systems. Among other qualities, such as the ability to enforce would-be users to log on before they can access the server's resources, they have robust file systems that can be secured on a per-file and per-directory basis.

It's feasible to run a server-based network with only two computers, but most people would settle for peer networking unless they had to secure their data. The simplest peer network connects two computers by cable. Simple file exchange can be achieved with a serial or parallel cable and some extra software to control the data flow (a parallel connection is faster).

Where software comes in

The variety of ways in which to connect two computers directly is beyond the scope of this article, but if you're into technical experimentation you can be really inventive with modern operating systems which include network software. A simpler approach would be to invest in some utility software; either shareware, or packaged like LapLink.

Some operating systems include suitable software for direct cable connection. If you have two Windows 95 PCs, the supplied InterLink software (which you can install from the Windows setup disks or CD-ROMs) works with either serial or parallel cables. To install it:

- Open Control Panel from the Settings menu on the Start menu and run the Add/Remove Programs applet.
- Go to the Communications option under the Windows Setup tab and place a check mark next to "Direct Cable Connection". Then press OK to install it.

Once you've done this on both computers, you can run the Direct Cable Connection application. The best that can be said for it is that it's no more expensive than the cost of a cable, if your time is free. The downside is that it can be erratic. If, for example, you use it to connect to a computer that is already attached to another network, it may not work. Annoyingly, you cannot use it and connect to the internet with Dial-Up Networking at the same time, because they use the same driver.

Ethernet cable — thin or twisted?

The best way to connect two computers in a permanent network requires two network cards and a piece of cable. Ethernet is the *de facto* cabling standard and there are two types in common use, described by the signalling system or the cable type.

Thin Ethernet cable (10Base-2 signalling), the older of the two, is being superseded by Twisted Pair (10Base-T or 100Base-T). There are two types of Twisted Pair (TP) signalling: 10Mbps (10Base-T) and 100Mbps (100Base-T). The latter is commonly known as Fast Ethernet.

- Thin Ethernet (RG-58/U 50-ohm) cable resembles TV aerial cable with an inner copper core and an outer braided shield, all wrapped in plastic. Metal BNC T-pieces connect the cables to the computer's network

interface card (NIC). The computers are linked in a chain which must be terminated at either end or the network won't work.

- Twisted Pair cabling resembles telephone cable and has a clear plastic (RJ-45) connector, similar to a modern telephone connector, at each end. Unshielded Twisted Pair (UTP) cable is commonly used. The same cabling suits both 10Mbps and 100Mbps signalling but a higher-quality cable, known as Category 5, is better for Fast Ethernet. In twisted pair networks, computers are connected to a central hub rather than chained together.

Network Interface Cards (NICs) are commonly described by their connector or cable type. Thin Ethernet NICs are usually described as BNC while Twisted Pair is variously called TP, UTP or RJ-45. Luckily, the cabling for Thin Ethernet cannot be confused with that for Twisted Pair, so when you're buying network hardware just specify BNC or TP first. If it's TP, you need to decide between 10Mbps and 100Mbps. For most small networks 10Mbps is fine.

Thin or TP: which to choose?

So, the initial decision is between Thin Ethernet or TP. For a simple two-computer network the cheapest option is Thin Ethernet. However, the way the system is laid out (the topology) might influence your decision:

- Thin Ethernet chains computers in straight runs.
- TP uses a star topology where each computer is individually cabled to the hub.

In the home, or a small office, Thin Ethernet looks better at first sight as it is easy to drape a long cable around an office or between rooms; however, there are more possibilities for failure. A single break in the cable will bring the whole system to a halt. Additionally, the connectors and terminators frequently cause problems which are hard to diagnose.

TP cabling requires a bit more thought and preparation but is more reliable and easier to expand. The cable is less obtrusive, too. Cabling a home office or small business with TP is almost identical to fitted telephone extensions.

Network Interface Cards

Having decided on the wiring scheme you'll need to buy some Network Interface Cards. The gradual move from Thin Ethernet to Twisted Pair has resulted in "combo" NICs which have both BNC and RJ-45 ports. Unless you're determined to begin with Thin Ethernet and then later trade up to TP, it's not worth paying extra for a combo card. But once you've settled for TP, you won't go back to Thin Ethernet. If you do settle for TP it might be worth investing in 10/100Mbps NICs which will work with 10Mbps or 100Mbps hubs.

Don't waste your money on ISA 10/100Mbps NICs; if you're going for 100Mbps, PCI NICs are the only way. Of course, you will need a computer with PCI slots, too. Wherever possible, it is best to use PCI NICs. Network cards were the first peripherals to go PCI in a big way, because of the performance and because they self-

configure. Most modern operating systems have networking built in and will automatically detect PCI cards and configure them.

Always buy quality NICs. They'll be supported in the operating system so you won't have to faff around locating drivers, and they'll give you less grief in the long run.

After terminators, the next major cause of network failure is the NIC itself. Frequently, with Windows 95 for instance, there will be no specific warning identifying the NIC as the cause of a network problem; only some cryptic reference to a failure to "browse", or equally unhelpful comment.

While NICs can be bought for as little as £15, this can be a false economy. A common complaint with Windows 95 is that one computer in a group of two or more "cannot see the network". Frequently this boils down to a dodgy NIC. So, once you've spent a day tracking this down while the network is unusable and no-one gets any work done, a £40 quality card from the likes of 3Com or Intel doesn't seem quite so expensive!

Now you're ready to network

If you only have two computers and you've bought the cable and the NICs, you're ready to get networked. Install the NICs, connect with cable, and start installing the software. With PCI cards you won't need to configure jumpers or work out which port and interrupt to set.

If you're buying new computers, buy the NICs at the same time and the vendor will be happy to install them for you, because it will reduce the odds of them receiving a support call from you.



The 3COM OfficeConnect family: a stackable hub

Give us a hub

There's a large variety of choice in hubs these days and prices have dropped a lot over the past year. A good-quality, four-port stackable, 10Mbps hub can now be had for under £50. It is possible to find cheap hubs, but the issue is whether you're networking to save time and money working with applications, or to learn how to diagnose and repair hardware incompatibility.

Once you get into hubs you will find that there are an almost infinite number of ways to connect them in order to add capacity, join BNC and UTP networks, mix 100Mbps and 10Mbps networks, add routers and manage networks. Lately there's been a boom in small business "stackable" hubs. These are designed to be



An eight-port hub from Intel

With Thin Ethernet, a NIC and a cable is all you need. TP generally calls for a hub too, but with only two computers to connect, you can use a crossover cable which transposes the receive/transmit wire pairs so that the "transmit" wire leaving the first PC "crosses over" and becomes the "receive" wire for the other computer. In general, a hub is the better option. Crossover cables are hard to source, although you can make your own.

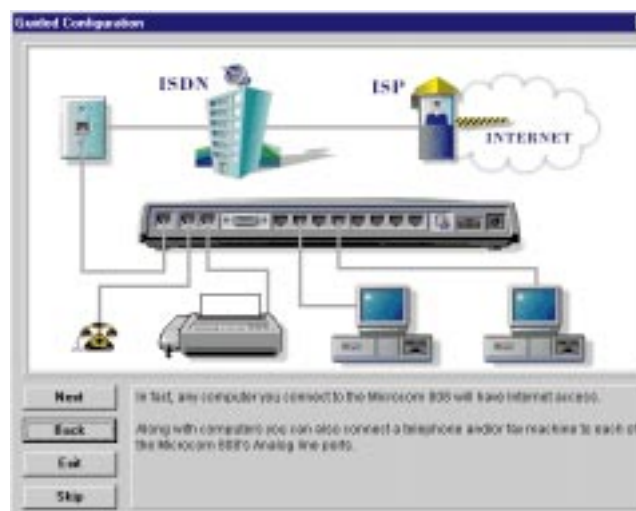


Fig 1 The easy configuration utility for the Compaq Microcom 800 Hub/Router includes a quick presentation of its capabilities

clipped together in aesthetically pleasing ways in order to extend the number of available ports, or the range of functions. The 3Com OfficeConnect range and Intel's more recent InBusiness line offer a variety of plug-and-play hubs and routers.

Server-based networking

Peer networks become cumbersome when several people work with large files or databases, and the person who gets lumbered with the shared printer connected directly to their PC notices it soonest.

Backup is a problem on peer networks because data is saved all over the place. And peer networks typically have no real security. For these reasons — performance, reliability and security — a server-based or “client/server” network is far preferable to peer networking.

Servers have fast file systems which can protect data with access control lists that restrict each user to a specific set of attributes for each file and directory. Everyone might be given “read” access to a shared database, for example, but only one might be allowed to “write” updates. Servers need plenty of disk space and RAM, but almost any modern computer is up to the task of serving a small network.

Servers used to be hard to set up but all that has changed now. Server packages aimed at small-business users are easy to set up (Fig 3) and administer and won't break the bank. Novell kicked off the category with IntranetWare for Small Business in 1996 and Microsoft followed suit last summer with Small Business Server.

Fig 3
NetWare for Small Business: configuration is easy with the Quick Setup tool



You may want internet access, too. As mentioned in last month's feature on Small-business Comms, ISDN routers make child's play of internet access and so are a real growth area. Both 3Com and Intel offer such routers in their stackable line-up. We've also been impressed by Compaq's Microcom 808 (Fig 1) which combines an eight-port hub and an internet router in one box. These devices are really easy to use.

Setting up software
Nowadays, operating systems routinely include networking facilities. A peer network can be set up with little or no hassle using Windows 95 (Fig 2), Windows NT, OS/2 Warp or the Apple MacOS. All will

Bone up on backups

One issue you must not forget when setting up your network is backup. This is a topic for future discussion, but do remember that networks can go wrong and a reliable backup strategy is the only way to recover quickly from a disaster.

A small network can get by with a Travan-3 tape drive, with a capacity of 3Gb, costing around £100. However, given the rapidly increasing size of hard disks, the better option for an entry-level network is a SCSI-based Travan-4 tape drive such as the Hewlett-Packard SureStore T4, costing between £200 and £250. A SCSI-based T4 drive has a capacity of 8Gb and is a lot faster than a T3 drive, which uses a floppy interface.

automatically detect network hardware as they are installed and throw up a network setup screen.

Adding networking to an existing system calls for a little more work. (Most people will probably be working with Windows 95.)

1. First, install the network card and boot up. If it's PCI, it will be detected and configured by Windows 95. If you've chosen cheap or obscure hardware or an ISA network card, you may have more work to do locating drivers.
2. Open the Add/Remove Hardware applet in Control Panel and ask Windows 95 to detect your hardware. If it fails to do so, you will have to install the card manually by selecting it from the list. If it isn't on the list you will need to find drivers for the card. Just buy a supported card, OK!
3. Once the NIC is installed and the PC has been rebooted, a NetWork Neighborhood icon appears on the desktop. If it isn't, check out the Networks icon in the Control Panel: right-click on it and open Properties. If the network card doesn't show up in the Configuration box, it hasn't been installed. You can install it from here.
4. Once the card shows up in this Configuration box, you need to be sure that the following components are installed. This may have been done for you, or you might need to add them by using the “Add” button and choosing from each category in turn.

Client — client for Microsoft Networks.
Adapter — your network adapter.
Protocol — NetBEUI.
Service — file and printer sharing for Microsoft Networks.
5. Select “File and Printer Sharing” and check the boxes for the resources you want to share. Now go to the Identification tab and give each computer a unique name. All

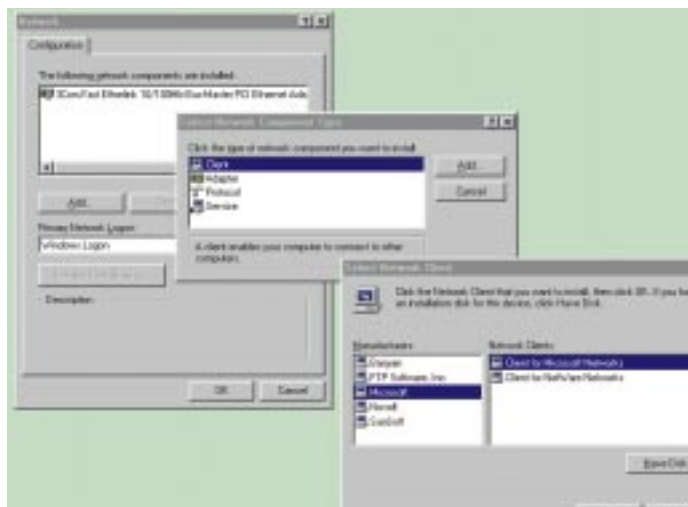


Fig 2 Setting up the Network properties for a small peer network based on Windows 95

Which server package would suit your needs?

Microsoft BackOffice Small Business Server 4.0

Small Business Server 4.0 is Microsoft's first shot at an easily-installed server-based network for 25, or fewer, users. It includes Windows NT Server 4.0, Internet Information Server 3.0, SQL Server 6.5a, Exchange Server 5.0, Outlook 97, FrontPage 97 and Proxy Server 1.0. In addition, there are two packages available only with Small Business Server: Fax Server and Modem Sharing Server.

Small Business Server enables small companies to share files, printers, modems, fax services and other resources over an intranet and can provide internet access for electronic mail, the worldwide web, a web presence, and connections with external suppliers and customers. The easiest way to include internet connectivity is via a Microsoft-accredited ISP such as Demon, but it costs more than a dial-up account. Small Business Server works with dial-up accounts but you must have a registered internet domain name such as yourcompany.co.uk.

Let's get graphical

Installation is mostly graphical. You need to enter your name and company name, the date, time and time zone. The Small Business Server Installation Wizard requests company details such as phone and fax numbers. Next up is the Small Business Server Console To Do list (Fig 4), a menu of basic procedures such as Install Printer, Add User, and Sign Up With An Internet Service Provider. These are all driven by wizards and not at all difficult to master.

To install the software on the client workstations you run another wizard which creates a client installation diskette, and trot over to the client PC to configure it. The client reads the disk, hums, whirrs and then reboots. When it starts up, it connects to the server and the

Small Business Server has some restrictions on use which generally preclude it from being used to network branch offices to headquarters or departments within a larger organisation. If you grow to need more than 25 clients you can upgrade to the full BackOffice Server 4.0 product, which will allow you to retain user accounts, fax server, modem pooling services and integrated management console, or to install Windows NT over Small Business Server. If you opt for the latter you will need new client licences, because Small Business Server licences are non-transferable.

Novell NetWare for Small Business 4.11

NetWare for Small Business 4.11, released last April, is the second release of Novell's easy-entry software for companies without in-house networking skills and 25, or fewer, client PCs.

The first version was released in 1996. NetWare for Small Business is based upon full-featured NetWare 4.11 but has a simplified NetWare Directory Service and the NetWare Easy Administration Tool (NEAT) which pares administration to the basics.

Version 4.11 comes with all the pieces required for email and internet connectivity for a small business or branch office, and inbound access to the network for remote access clients. Client software for Windows 3.1, Windows 95, Windows NT, OS/2 and Apple Mac is supplied. A server PC with a 486 CPU or better and at least 32Mb RAM, a 1Gb hard disk and a CD-ROM drive is required.

NetWare for Small Business includes full versions of GroupWise 5.2 email with document management, plus NetWare Internet Access Server, NetWare Multiprotocol Router and NetWare Connect. Together these enable dial-up internet access for network clients and inbound LAN access for remote clients. A standard dial-up account is enough for net access, and you don't need to know much more than the account name and password and the ISP's telephone number.

Novell also bundles a bevy of third-party applications from Cheyenne: FAXserve 5 for two concurrent users, a five-user ARCserve 6.1 backup-and-restore utility, and InocuLAN 4.0 virus protection for the server. Five-user versions of the Netscape Fast Track Web server and Oracle 8 database are included.

The server requires a PC (486 or better) with 32Mb RAM and 1Gb of disk space. NetWare Small Business can install itself on an existing PC without deleting any existing operating system and it can be used to upgrade an older NetWare 2.x or 3.x system. Once the server software has been installed, the rest of the system is configured from an administrator's workstation running Windows 95. As users are added, their email mailboxes are automatically created. When users log on for the first time, an application launcher window opens on their desktops to reveal icons which initiate the installation of the GroupWare mail and scheduler client and the Netscape browser. It is straightforward and backed up with step-by-step documentation in HTML format.

NetWare is licenced "per client". The entry point is a five-client kit and additional licences can be purchased in single units. NetWare Small Business can easily be integrated into existing NetWare LANs or upgraded to a full NetWare licence when client numbers top 25.

Novell or Microsoft — it's your choice

For the average small business seeking to network five to ten computers, both NetWare for Small Business and Microsoft Small Business Server have a lot to offer in the feature department, except NetWare servers can make do with less powerful hardware.

Microsoft's package gives you everything you need to set up a small intranet or internet service in the box, whereas with Novell's product you have to do a little more gathering of pieces such as the web server, and assembly. On price alone, though, NetWare is way ahead, with the street price for the five-user version coming in at around £500 against £900 for the five-user Microsoft.



Fig 4 Microsoft Small Business To-Do List leads to web-based configuration dialogs for setting up and administering the server

required software installs over the network.

For the Small Business Server you need a Pentium 100 (or better) with 64Mb RAM and a 2Gb hard disk. The faster the processor the better, and more RAM never goes amiss in a server. It will also need a CD-ROM drive for installing the server software, a network adapter and a faxmodem. Small Business Server supports Windows 95, Windows 98 and Windows NT Workstation 4.0 clients.

computers in the network should have the same workgroup name.

6. Close Network properties and reboot the computer.

Now you have a peer network and can share resources by right-clicking on them and then by selecting the "Sharing" option.

● Terence Green writes a regular PCW Hands On column dealing with OS/2 (see page 247).

Contacts

Microsoft BackOffice 4.0 Small Business Server 0345 002000

www.microsoft.com/uk/sbs/

Novell NetWare for Small Business 4.1101344 724100

www.novell.com/intranetware/products/smallbiz

3Com OfficeConnect Hub 8 and

ISDN LAN Modem 0800 225252

www.3com.com/smallbusiness

Compaq Microcom 808

Hub/Router Compaq 0845

270 4222 www.compaq.com/products/networking/access

Intel inBusiness 8-Port Fast

Hub 01793 403000

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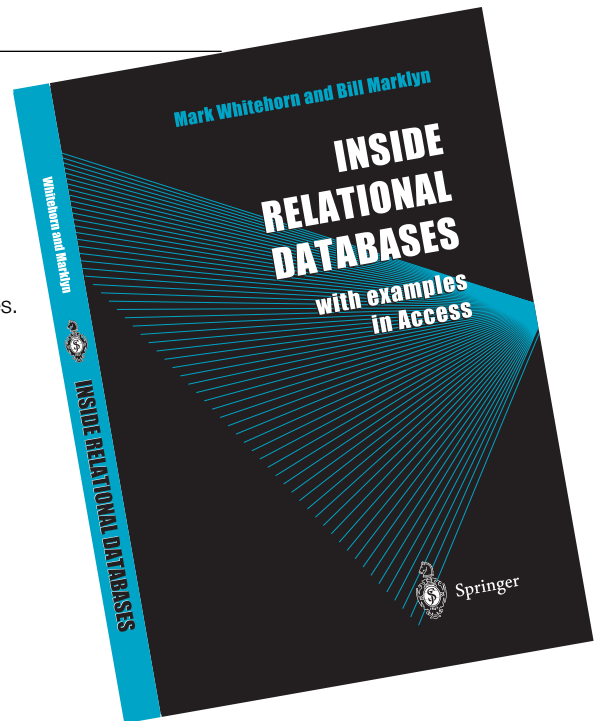
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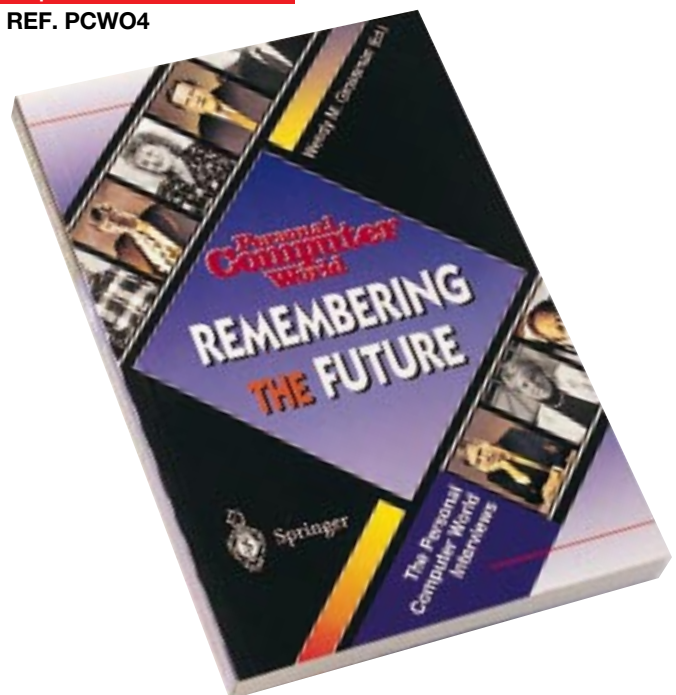
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Cliffhanger

What next for the man who ‘must have a purpose in life’? Now he has sold Demon Internet for £33 million he can retire, right? Wrong. He is starting up a new company. Michael Hewitt talks to Cliff Stanford about his future plans.

Cliff Stanford’s PR lady was most anxious that our photographer should only show his top half. Everything below the waist was strictly *verboten* — why, I do not know. If he’d had a penchant for high-heels and fishnet tights, or was mounted on casters, it might have made some sense. As it was, everything looked perfectly respectable.

Maybe it was some sort of ploy to stimulate demand. Perhaps there’s a thriving market in illicit pictures of business entrepreneurs’ legs, with fortunes to be made for the right pair. Probably not as much, though, as the £33 million Cliff has already made after selling his half of Demon Internet to Scottish Telecom. Speaking of which, I said that if I’d suddenly come into £33 million, I’d be on a yacht somewhere, knocking back Martinis, not talking to me in the bar of the Langham Hilton. And certainly not setting up another business. Not yet, anyway. But that’s what Cliff is now doing. Sixteen of his millions are currently being ploughed into RedBus, described as a “get started” company. How come?

“At Demon, all sorts of people used to send me ideas for business ventures. I’d get at least one very good one per week landing on my desk. I’d look at it and think, ‘that’s wonderful. I wish I had time to pursue it and help this guy get it off the ground’. Now, having sold Demon, I’ve got the time and the capital to do exactly that.”

On the buses

So, for example, someone comes along with an idea for a better mousetrap but has neither the business acumen nor the money to take it much further than the cheese-sourcing stage. This is where RedBus comes in.

RedBus? “I was saying to my lawyer that I wanted to make some investments and he said to me I’d need a vehicle in which to do it. And you know how it is with investments. You don’t see a good one for ages, then suddenly three turn up at once.”

If Cliff likes the idea, he’ll invest in the venture. In return, that company becomes “Mortimer’s Mousetraps — a RedBus company”, with Cliff taking a seat on the board and where necessary applying a guiding hand on the tiller. Over 800 ideas have already landed on his desk.

“In part, what I do is supply seed capital. Sometimes,

raising the first £10,000 is more difficult than raising the first £10 million. Hence RedBus. But as well as supplying money, I supply my own business experience and the experience of the people around me, which will add greatly to the strength of the company. That and the common branding.

“At the moment, of course, it means nothing. But soon when we’ve got, say, three or four enterprises off the ground, being seen as part of the RedBus group will make all the difference. RedBus will stand for British, for quality, and for innovation.”

That it will stand for anything at all is down to Cliff Stanford’s remarkable success with Demon Internet over such a comparatively short period of time. If he hadn’t got that right, the very concept of flat-fee dial-up internet access — one that’s taken for granted now, the world over — would almost certainly have died a death.

Recipe for success

So how did it all start? Let’s look at where he was born, his childhood. “I was born in London and brought up in Southend-on-Sea. My parents worked hard and brought in a good salary, particularly my mother who held down a large number of different jobs, mostly associated with bookkeeping. She taught me bookkeeping and accountancy when I was young because I was interested in what she was doing and wanted to help out.”

In his late teens, he went into Articles with a view to becoming an accountant. “It proved to be a very good, solid start to a business career. I was lucky in that I got a job with a highly entrepreneurial firm of accountants. I worked in their tax and company planning department so I was able to see a lot of the mistakes made by other businessmen and work out exactly why they’d happened. And when they got it right, I saw that, too, and could begin to understand the recipe for success.”

If there was a single Road to Damascus experience, it was probably in 1977, when Cliff taught himself to program one of the fledgling programmable calculators that had just arrived on the scene. This led to bigger and better things. Specifically, to the Commodore PET. In 1979, having mastered one of these, he set up on his own and started a company called ImPETus which,



predictably, produced management and accountancy software for the PET. But when, in the mid eighties, the PET eventually bought the farm, along with Dragons, Einsteins and others of that ilk, he switched to turning out MS-DOS-based software instead, for those upstart IBM PCs. This meant that the name ImpETus was now a bit silly, like Dodo Software or Great Auk Ltd. So, on a whim, he renamed the company Demon Systems.

"It was the strongest name we could come up with at the time. From 1985 onwards, it became quite a successful small software house which earned me a pretty good income. But although I was quite happy with it, I was also getting a bit bored as there wasn't enough

to do. So I started filling my time playing around with the fledgling online services that were around then. By 1991, I was heavily involved in bulletin board systems like CiX. And then the internet started picking up."

Back then, the internet was basically a collection of educational, commercial and defence computers. Unless you were an academic or a brigadier general, it was fairly difficult (and expensive) to get direct access. UKNet, at the University of Kent, could fix you up with a dedicated line but you had to shell out £20,000 for the privilege. Why anyone would want to, anyway, at the time mystified me. Pre-worldwide web, the internet was an utter mess to use, with a whole lot of arcane, user-hostile interfaces.

Quids in — and lots of them. But far from resting on his £33m laurels or quaffing champagne on a yacht, Cliff Stanford is on the business move again, this time with Redbus, investing in new business ideas

p132 >

'My greatest, proudest achievement is to have created 520 new jobs in an industry that hadn't existed before. That is what I'd like to be remembered for'

Finding your way around was like shopping in Argos without a catalogue. I couldn't see it catching on, myself, but Cliff Stanford could. Which is one of the reasons, of course, why I was interviewing *him*, rather than the other way around. Anyhow, the future, he believed, lay in offering low-cost dial-up access.

The tenner-a-month club

"In 1992 I overheard someone saying that we would never get low-cost internet provision in the UK. But I reckoned that, at £20,000 for a connection, if I could get 200 people together to invest just £10 a month over a year, that would cover the costs. My business plan said that with 200 people I'd break even; with 400, I'd make a profit."

Cliff floated his idea on CiX, where he set up a conference called `tenner_a_month`. He called it this for two reasons. The first, naturally, was because that was how much he was proposing to charge. The second was that, at the time, CiX conferencing had a bug that didn't allow conference names to be more than 13 letters long. So `tenner_a_month`, at 14 characters, forced them to fix it. Not a lot of people know that...

"Remember that all I had then was an idea. Nothing concrete. The first 120 customers sent me their cheques for a year's subscription in advance, which I promised I wouldn't bank until the service was actually up and running." Most people doubted it ever would be. Others reckoned that, even if Cliff succeeded in getting it started, it wouldn't last. Sylvia Wrigley, for instance. "I thought '£10 a month? This has got to be a mistake. The company can't be viable. As soon as they get their numbers up, they'll fold.'" She has, however, come round since then, and to prove it, is now Demon's Online Marketing Manager.

It says something about Cliff's perseverance and self-confidence that he was prepared to soldier on when even people who knew what they were talking about had the gravest doubts. But on 1st June 1992, Demon Internet went live and the first customer logged on. "The light of the modem went on and straight away they went to an FTP site in the States and started downloading files."

Night moves

It wasn't exactly plain sailing, though. "Just about anything that could go wrong, did. At the beginning, we had a 24-hour support service... me. I used to have to get up in the middle of the night to go around to the office and kick some machine that wasn't working. It was quite normal for a customer to phone me at 3a.m. and say, 'Hi, Cliff. One of your servers has broken. Can you fix it?'" All that was to be expected, though. We were innovating. We were building with string and Sellotape."

Nevertheless, the string and Sellotape held together and, by word of mouth, the company grew steadily. By 1993, just a year in, it had reached a much firmer stage

and had become, in Cliff's words "very much the tail wagging the dog."

By 1994, the internet side of Demon had become so profitable, that he was able to consider closing down his software business. By October 1995, Demon Internet reached 45,000 subscribers. The original budget plans, back in 1992, had forecast only 4,500 by this date. The growth rate therefore came as something of a surprise. "I never imagined that we'd ever be bigger than, say, CiX, with its 6,000 customers." And the reason behind the company's success? "We were always six months ahead of the game. We had the best technical people, the best new ideas and we were the most innovative."

Investments pays off

The company's massive investment in infrastructure and hardware also helped. This, too, required steady nerves. "When I first put in a 64K line to the US, the contract I signed was equivalent to my run-on annual revenue. That was the biggest risk I ever took because I had absolutely no way of financing it other than by taking in money with future growth. The same when I put in a DS3. We signed a £15 million contract on a £15 million revenue. If either of those risks had been the wrong one, I wouldn't be sitting here telling you about my success. I'd be telling you how I went bankrupt."

But he wasn't. Under his guiding light, Demon Internet became the largest provider in Europe, gobbling up a few smaller ones in the interim. Now, 47 percent of UK web sites are Demon-based. So why didn't Cliff stay with it?

"I'd built up a very strong management team at Demon, who basically ran the company. So I'd done my job there and there was nothing else for me to do. But I like to have purpose in my life. I love to be able to get involved in things, to get them up and running and do all the negotiating. I want to do that again, start from scratch."

Proud legacy

Scottish Telecom wasn't actually the highest bidder for Demon but it was the only company which guaranteed that there would be no redundancies. Cliff was adamant about this and is proud of the legacy he's left behind. "Yes, I suppose I could list my greatest achievements as having brought the internet within the reach of virtually everyone. Or being among the first to bring IP to the desktop. Or the first to include virtual web hosts in accounts. But by far my greatest, proudest achievement is to have created 520 new jobs in an industry that hadn't existed before, all of them highly skilled in their own fields. That is what I'd like to be remembered for."

And for the future? "If I had crystal balls, they'd break when I sat down. To make one or two of the RedBus companies as big as Demon, I suppose, if not bigger. Hopefully in the same sort of timescale."

Watch this space. ■



Power stations

Paul Trueman tests ten towers of power — PC systems sporting 400MHz of sheer computing speed — and assesses what you can get for around £2,000.

After months of the OEM cost-cutting battle that has seen the rise of the cheap and relatively powerful PC, we were beginning to get the urge to spend some big money. Rather bored with low prices for home users and piffling 3Gb hard drives, we decided to go for our ideal high-end PC for £2,000 (ex VAT).

So what's out there in this new budget-friendly market? Can you expect SCSI? What sort of storage devices are packaged with the PCs and will the companies provide modems or network cards? We were keen to find out what you get in a high-end PC that is worth forking out for. In a word, it's *power*.

Power equates with speed, and speed is the most marketable asset of any PC. Vast amounts of digit-crunching power might not be too important for the average spreadsheet and shoot'em-up user on their home PC, but multitasking office machines running increasingly processor-hungry software need power to burn. IT managers must be starting to wonder what sort of minimum specification is going to run the much-vaunted Windows NT 5.0 that's just around the corner. We've previewed the latest beta on page 151.

Bearing all this in mind, we requested that each of the ten manufacturers participating in this group test supplied their machine loaded up with Microsoft's two flagship operating systems, Windows 95 and NT 4.0. We debated whether to go for Windows 98, but didn't want to gamble on whether all our manufacturers would be able to get their hands on gold code before the machines had to be with us for testing. So, the specifications for the group-test machines

were left relatively open because we were intrigued to see what each company would come up with for £2,000. We were not too specific because we wanted all the machines to have a standard processor—the new, top-of-the-range Intel PII 400. We also wanted to concentrate on the PC itself, so to help stabilise the system's configurations we fixed the monitor size at 19in.

400MHz PCs Contents

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Ratings

- ★★★★★ Buy while stocks last
- ★★★★☆ Great buy
- ★★★☆☆ Good buy
- ★★☆☆☆ Shop around
- ★☆☆☆☆ Not recommended

Atlantic Proteus

Atlantic scored points as soon as we noticed that its system had been fitted out with both a DVD drive and a Zip drive from Iomega. Of all the companies providing systems for this group test, only Atlantic had been generous enough to put both in the same PC and we were impressed by such generosity.

There was no SCSI or ethernet card, which we found in other PCs, but Atlantic had put together an undeniably impressive package: a 56K modem with the Rockwell chip, Creative Labs AWE64 audio card,

and the superb 8Mb Xpert@Work graphics card from ATI.

The IBM hard drive was a hefty 8Gb, using the souped-up UDMA2 interface. Admittedly the 64Mb of SDRAM running at 100MHz looked a little skimpy next to the 128Mb on offer in other machines, but then, we had asked for a machine optimised for 2D office apps, which don't need anywhere near 128Mb to go like the clappers.

We were slightly less impressed by the Creative Labs DVD-ROM drive when we tried to actually play a Region 2 DVD-ROM. Region 2 is the European area and whoever had set the Soft DVD software settings had decided to pick another region. We couldn't reinstall the software because

Atlantic hadn't included it in the package.

The Proteus was an impressive overall performer, scoring well in our tests. Its Windows 95 score was excellent, as one would expect from a PC using the ATI graphics card that won Editor's Choice in our recent group test [December 97]. The two SYSmark scores were not the highest by any means, but the Proteus is nonetheless an impressive all-rounder.

We were won over by the performance of the 19in monitor. The Mag Innovision DJ800 produced a stonking 100Hz refresh rate at 1024 x 768 and had an innovative OSD control, a dial rather than the usual buttons.



PCW Details

Price £2,349 (£1,999 ex VAT)

Contact Atlantic Systems 0990 134725
www.atlanticsystems.com

Good Points DVD and a Zip drive.

Bad Points Pity the DVD drivers had not been included.

Conclusion A generous package for techno-junkies.

Build Quality ★★★★★☆

Performance ★★★★★☆

Value for Money ★★★★★☆

Overall Rating ★★★★★☆

Dabs Direct Pentium II 400MHz Business

Our first impression of the Dabs PC was that you are going to need a BIG desk. This Goliath of a tower offers acres of internal space to anyone wishing to upgrade in the future, with three spare forward-facing 5.25in drive bays as well as two spare 3.5in bays and three already taken up by the floppy, Zip and hard drives.

This machine performed well in our tests, recording impressive scores in both NT and 95 SYSmark tests. The Windows 95 SYSmark score was higher than that under NT (as it was with all the

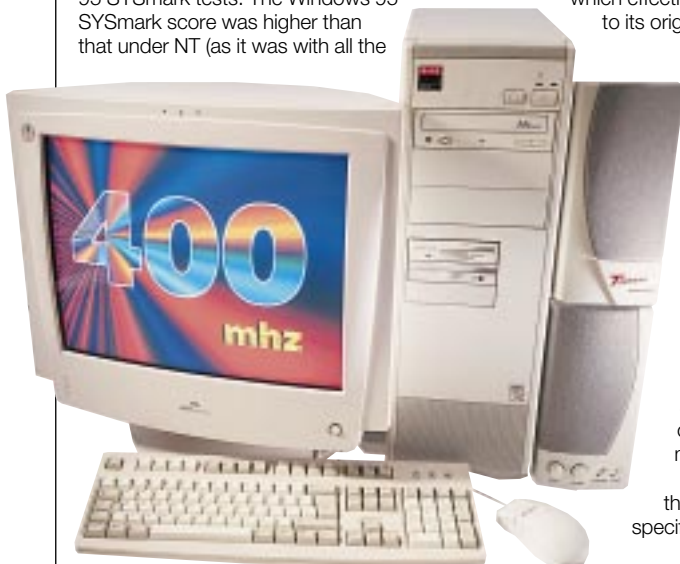
PCs). The 95 and NT scores are not comparable, not simply because they are run under two different operating systems with different applications, but because they have different methods for running the test. When run under Windows 95, the script reboots the PC, so resetting the RAM before testing the individual applications. NT runs the whole test without rebooting, but NT itself empties the RAM each time you quit an application, which effectively returns the machine to its original state. So, there is no need to reboot the machine to achieve coherent results.

The entire 128Mb of SDRAM was held on one DIMM, leaving two free slots for expansion. The AGP slot was filled with the Matrox Productiva G100, a 2D-only card, while one of the four PCI slots was taken up by the Crystal Soundfusion sound card. Of the two ISA slots, one is spare and the other contained a K56Flex modem.

Dabs is one company that fulfilled our original specifications, and then added

an "extra" — the Zip drive from Iomega. Of the PCs in this group test, all, apart from the Hi-Grade with an LS120 drive, offered the Zip. The advantage of LS120 drives is that you can use conventional 1.44Mb floppy disks in them. If your PC has a Zip drive, it will need another drive for floppies.

We weren't too impressed by the ADI Microscan monitor. The picture's standard resolution of 1024 x 768 was not as sharp as the other monitors we saw. It offered 85Hz refresh rate at 1024 x 768 but when taken up to 1152 x 864 the refresh rate dropped to an unimpressive 60Hz.



PCW Details

Price £2,231 (£1,899 ex VAT)

Contact Dabs Direct 0800 558866 www.dabs.com

Good Points Great performance in 2D tests. Plenty of room for expansion.

Bad Points Suffers in the 3D tests from a 2D-only card.

Conclusion A solid performer.

Build Quality ★★★★★☆

Performance ★★★★★☆

Value for Money ★★★★★☆

Overall Rating ★★★★★☆

**Personal
Computer
World**

**Highly
Commended**

Elonex PTX-6400/i

All internal cables and power connections on the PTX were neatly bound, and the insides of this PC looked surprisingly spacious when you bear in mind how much hardware Elonex had managed to kit the system out with.

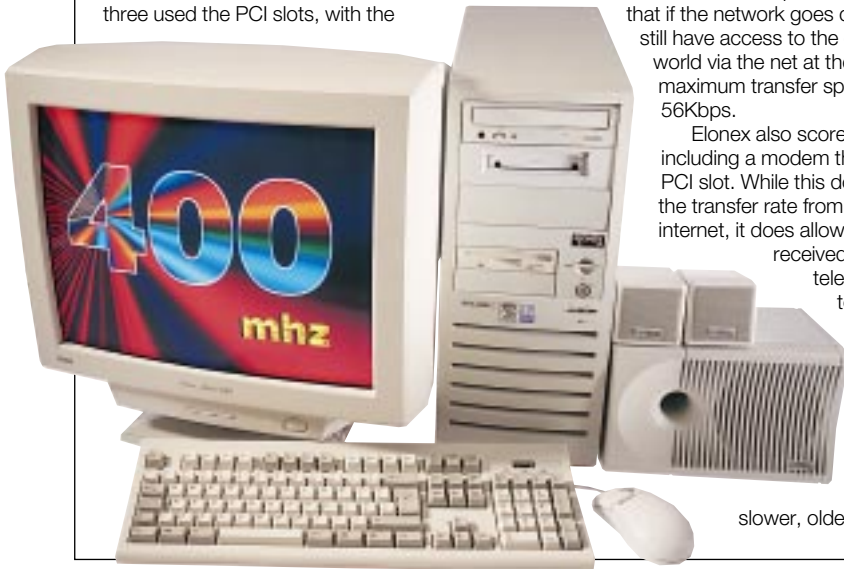
In fact, with four cards inside the machine, this was one of the most generous hardware packages we saw in the group test. None used the three free ISA slots. Instead, three used the PCI slots, with the

graphics card taking the AGP slot. For a start, this was one of the few machines to utilise both a modem and a network card. Most systems supplied one or the other, and if you're only going to have one, access to a LAN is preferable in a work environment for the advantages a network can bring, as well as giving the option of internet access via the server. With both, though, you can have an office network set up but also ensure that if the network goes down, you still have access to the outside world via the net at the theoretical maximum transfer speed of 56Kbps.

Elonex also scored points for including a modem that uses the PCI slot. While this doesn't affect the transfer rate from the internet, it does allow the data received from the telephone wire to travel through the system at the PCI bus speed rather than that of the slower, older ISA bus

speed. As more motherboard manufacturers are limiting the number of ISA slots, having a PCI modem means you have more ISA slots or other, older device interface cards. The PTX had a tape drive, too, using the Travan tapes that allow up to 8Gb compressed (4Gb uncompressed).

Elonex had opted for one of the most popular 19in monitors on the market, the Vision Master 450 from Iiyama. The focus was as sharp as we have seen on this model before, which highlights the weight of the graphics card in the equation. The refresh rate of 100Hz at 1024 x 768 was impressive.



PCW Details

- Price** £2,203 (£1,875 ex VAT)
- Contact** Elonex 0181 452 4444
www.elonex.co.uk
- Good Points** Lots of lovely top-notch hardware.
- Bad Points** Only 64Mb of RAM.
- Conclusion** A future-proof winner.
- Build Quality** ★★★★★
- Performance** ★★★★★
- Value for Money** ★★★★★
- Overall Rating** ★★★★★

Evesham Micros Platinum PII 400

Evesham Micros prides itself on the range of PCs it can offer its customers, and its Platinum PII 400 was an impressive performer in the group test. The configuration was impressive, as was the layout of hardware inside the computer.

The majority of PCs we saw had 128Mb of SDRAM, and the Evesham was no exception. It also had a K56Flex modem using the Rockwell chip, and an AWE64 sound card. Even though there is a new generation of sound cards coming through, the AWE64 still represents excellent value for money. The

Seagate Medalist Pro was a hefty 8Gb UDMA2 hard drive and we were impressed to see that although our specifications had indicated more interest in the performance of 2D apps, Evesham had fitted its PC with the impressive Xpert@Work AGP graphics card using the 2X AGP technology, with its maximum of 8Mb of SGRAM. This is partly the reason why the 400 performed so well in the 3D Final Reality tests we ran under Windows 95, but the 400 also did well in our 2D SYSmark tests, scoring highly under Windows 95 and NT.

Those nice people at Evesham had also included a DVD drive, along with all the Soft-DVD software and a DVD film (last year's *Batman and Robin*).

One of Intel's many claims for the PII 400 and 350s when released, were of the performance gains one could expect for DVD played on a PC without hardware MPEG.

We watched parts of the film and it all ran beautifully, with none of the discernible frame-dropping that marred Soft-DVD when it first appeared. The DVD drive was an unexpected bonus, and while it may not be that useful in an office environment, it is a lovely piece of kit to have sitting inside your PC.

Evesham had included Taxan's Ergovision 975 monitor. The picture wasn't as sharp as with some of the other monitors we looked at in this group test, as shown by the loss of focus around the edge of icons on the desktop. The Taxan did have an excellent OSD, though, with only four manual buttons and all of the numerous options easily accessed by the easy-to-follow menu.



PCW Details

- Price** £1,996 (£1,699 ex VAT)
- Contact** Evesham Micros 0800 4960800
www.evesham.com
- Good Points** Good 2D and 3D scores. Impressive DVD drive.
- Bad Points** Your boss might not like you watching films all day.
- Conclusion** An impressive machine with top-of-the-line kit.
- Build Quality** ★★★★★
- Performance** ★★★★★
- Value for Money** ★★★★★
- Overall Rating** ★★★★★

Hi-Grade Axion Pv2 400SL

We are used to receiving impressive kit from Hi-Grade, and the Axion Pv2 400SL was no different. It was not the largest tower case we saw, but it had been put together in such a way that it appeared cavernous inside. Admittedly there wasn't much hardware inside, just the excellent 8Mb SGRAM Xpert@Work card and the Yamaha sound card.

The Axion Pv2 came with a quick, efficient SCSI interface. The SCSI

controller for the 9.1Gb IBM UltraStar 9ZX SCSI hard drive was an on-board Adaptec chip, freeing up a PCI slot. On a card SCSI controller you have a ready-made external port, but HiGrade had made it possible to daisy-chain peripherals to the PC, with a connection from the hard drive to a port on one of the blanking plates.

There is plenty of room for expansion inside. There were four spare PCI slots, one of which is shared with one of the two ISA slots. The main disadvantage of this machine compared to most of the others in this group test, is the lack of any way of connecting to a LAN or to the internet. Most other PCs had either network cards or a modem, and some had both. We hadn't specified that it should have had this function, but we had mentioned to all OEMs that we were looking for powerful office machines.

Few machines with network cards or modems also had SCSI devices as well, and this may be perfect if you are

looking for a machine that can retrieve data from a hard drive at great speed. There was data storage capability though, as a single 3.5 in drive bay had been taken up by an LS120 drive. Backwards-compatibility with floppy disks means that extra room is not needed for a 3.5in floppy drive.

The 19in Vision Master 450, from Iiyama, was an impressive choice of monitor. Although the focus was not pinpoint sharp in all the corners of the screen, the refresh rate of 100Hz at 1024 x 768 was impressive.



PCW Details

Price £2,344 (£1,995 ex VAT)

Contact Hi-Grade 0181 532 6123
www.higrade.com

Good Points Has the backwards-compatible LS120 and SCSI.

Bad Points No network nor internet connectivity.

Conclusion A solid machine with attractive extras.

Build Quality ★★★★★
Performance ★★★★★
Value for Money ★★★★★
Overall Rating ★★★★★

Lexon 902EL

Lexon was one of only three companies in this group test to kit its PC out with a tape storage drive. With the emphasis firmly on impressive office machines, manufacturers had obviously borne in mind the need for archiving files when kitting out their machines with "bonus" hardware. In a group test which looks at high-end, powerful, office kit, it came as no surprise that so many companies opted to include

3.5in storage drives to supplement the increasingly outmoded floppy. Lexon had also included the TapeStor drive from Seagate, using the ATAPI IDE model, capable of storing up to 8Gb of data when compressed and four when uncompressed.

When we opened it up, our first impression was clouded by the fact that the Lexon engineers had used black tape rather than the usual plastic clips to keep the numerous power cables together and out of the way. This worked well, although it looked a little naff and gave the PC a certain "homemade" look that its subsequent performance belied.

Lexon had chosen quality components, from the K56Flex modem to the Creative Labs AWE64 sound card, so ensuring excellent sound should your machine be needed for presentations. The Lexon machine was also kitted out with Seagate's 8Gb Medalist Prohard drive, as well as the 2D Matrox Productiva 100 with its full

complement of 8Mb of WRAM. While the Final Reality test scores were understandably rather disappointing, the Productiva's 2D strengths may have contributed to the excellent scores we received from the machine when running our SYSmark tests, in which it came out on top.

The Mag Innovision DJ800 monitor produced an excellent picture and could manage a healthy 75Hz even at resolutions higher than the standard 1024 x 768. The OSD control was unusual in that it's a dial rather than buttons. This took a little bit of getting used to, but in terms of aesthetics it looked a lot better than the usual array of clunky knobs.



PCW Details

Price £2,461 (£2,095 ex VAT)

Contact Lexon 0181 667 1173
www.lexonpc.com

Good Points Excellent scores on 2D apps.

Bad Points Lexon was slightly over budget.

Conclusion Pricey but classy.

Build Quality ★★★★★
Performance ★★★★★
Value for Money ★★★★★
Overall Rating ★★★★★

Multiboot systems

Right Partition Magic changes disk partitions on the fly and it's a pleasure to work with

Below Don't try to install Windows NT 4.0 or earlier as a dual boot system with Windows 95 or 98 unless you're sure that the C: drive is not a FAT32 drive

Setting up a multiboot system to boot both Windows NT and Windows 95 or Windows 98 isn't particularly difficult, but there is a major snag. Windows NT 4.0 and earlier cannot read the FAT32 file system which may have been installed on PCs shipped with pre-installed OSR2 versions of Windows 95 since December 1996. Boxed retail versions of Windows 95 are OK. OSR2 versions can be identified from the General tab of the System applet in Control Panel as they have a B or C after the 4.00.950 version number.

Windows NT will install onto any logical partition but cannot read FAT32 drives. The snag is that it has to see a real C: drive formatted as FAT16 (or NTFS) as it starts up.

Highlight C: in Windows Explorer and right-click for Properties to see whether the drive is Type: FAT32. The only way to add Windows NT to a system with a FAT32 C: drive is to reformat C: as FAT16. The complete process is beyond describing here but suffice it to say there are further snags with OSR2 to trap the inexperienced and the unwary.

If you really, really want a dual boot system and you're not a partition expert, the safe approach is to reformat with retail Windows 95 which knows nothing of FAT32. Alternatively, buy a copy of Partition Magic. System Commander is OK but I prefer Partition Magic as it doesn't rely on additional boot drivers. Remember, you should back up valuable data and make recovery disks called a Startup Diskette in Windows 95, and an Emergency

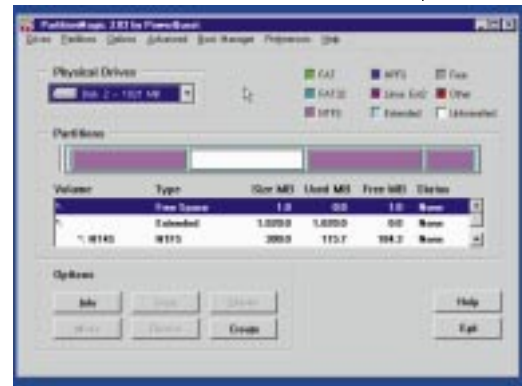
Recovery Diskette in Windows NT.

If you have your backups, the recovery diskettes, and you *do not* have a FAT32 C: drive, you are ready to create your dual boot system. Insert the Windows NT CD into the CD-ROM drive and run SETUP. Do not install it into the same subdirectory (folder) as Windows 95 because Windows NT cannot be used to upgrade Windows 95.

Also, you must re-install your Windows applications in Windows NT because it can't migrate the settings from Windows 95. Keep the operating systems and applications for the Windows 95 and Windows NT sides separate while storing the data on a third logical drive. It helps with the backup strategy, too.

Most dual boot systems are set up to add Windows NT to Windows 95 but sometimes we have a Windows NT system and want to play games or use some piece of hardware. The process is exactly the same, with one important qualifier: you must have a FAT16 DOS partition on the Windows NT system, and you must boot into DOS using the NT multiboot menu before running the SETUP program on the Windows 95 or Windows 98 CD.

Terence Green



What's it to be: Windows 98 or Windows NT?

From Microsoft's point of view, Windows NT Workstation is a business OS while Windows 95/98 is a consumer OS. But when we translate this from marketing-speak into English, it means that one is reliable

and the other is not. If you have a fast Pentium desktop machine with 64Mb RAM or more and you are not a major games player or portable PC user, then Windows NT Workstation is by far the better desktop OS.

However, until Windows NT 5.0 appears there are some points to consider. The trade-off that Windows NT makes for reliability is in backwards compatibility for DOS and Windows applications. Windows 95 and 98 run on top of DOS which, as a single-user OS, never expected to run more than one

application at a time. Accordingly, DOS applications access PC hardware directly. Windows attempts to coordinate applications so that they can share hardware resources but does not prohibit them from direct hardware access; Windows NT does, and this causes problems for some games and for older DOS and Windows 16-bit applications. Not all of them run on Windows NT 4.0 and those that do may run very slowly.

So, the first check to make when deciding whether to switch to Windows NT 4.0 is to see if you can afford to

stick to 32-bit Windows applications. Then, you need to check that your hardware is supported by perusing the Hardware Compatibility List on the Microsoft web site.

The driver situation is important. Most PCs and peripherals from the past few years are supported but some manufacturers of common hardware components have not yet created software drivers to support Windows NT 4.0 as well as Windows 95. This is mostly apparent with fax, scanners, sound cards, and some PC Cards (PCMCIA).

NT 4.0 also lacks the support for power management and USB that Windows 95/98 has, does not allow hot-plugging of PC Cards, and has a lower level of support for plug-and-play and DirectX multimedia. Most of this will be addressed by Windows NT 5.0 but that's only going into a real beta phase now and probably won't ship until 1999.

Due to the lower level of PC Card and power management support, portable and laptop users need to be particularly careful in assessing the NT compatibility of their systems. The situation has become much better over the past few years and you can be pretty much assured that leading portable vendors will supply the requisite drivers for their systems to satisfactorily run Windows NT. Third-party support, enabling PC Cards to be swapped without first powering down the system, is available from SystemSoft but don't forget to check the supported list before you buy.

If you've successfully cleared these hurdles you should definitely consider upgrading to Windows NT 4.0 Workstation. It's more reliable, extracts more performance from the hardware, and protects your data better.

Terence Green



You need Windows NT if you want to be able to control who accesses the files on your system. Windows 95 or Windows 98 cannot do this

Panrix Fusion G400

The G400 had excellent components but was one of the few to include only 64Mb of SDRAM, rather than 128Mb.

Although this could disappoint some, one could argue that if a PC is running largely 2D office apps, like those in Office 97, there should be little noticeable difference in performance between a PC with 64Mb and another with 128Mb of main memory. This is borne out by its spectacular scores gained in our SYSmark test. The 64Mb was held on the one DIMM, leaving another two

free for memory expansion should the necessity arise.

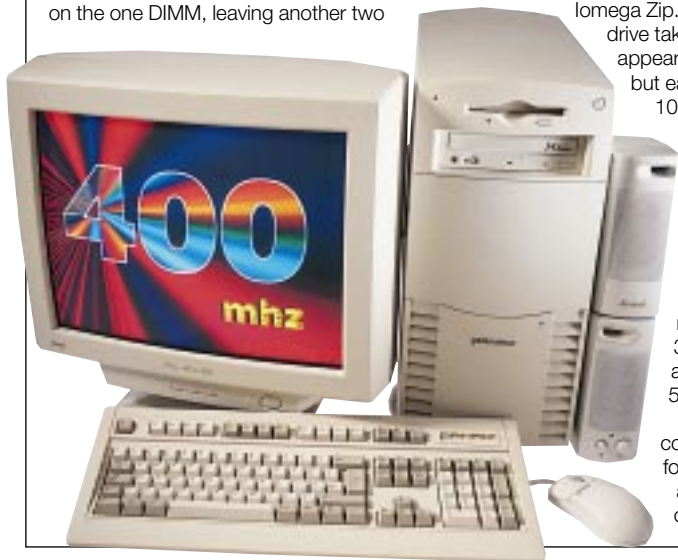
When working out the best possible spec for these machines, companies often limit their choice of components in some areas, in favour of others. Panrix pushed the boat out with the massive 10.1Gb hard drive from IBM, using the UDMA2 EIDE interface.

Most other companies had opted for some "bonus" piece of kit, and Panrix was no different, fitting out the Fusion with an Iomega Zip. For the uninitiated, this drive takes disks similar in appearance to floppy disks, but each can store up to 100Mb of RAM. Unlike the LS120 drives, though, the Zip isn't backwards-compatible with the regular 1.44Mb floppy disk, and it takes up a 3.25in drive bay in the tower. This leaves a remaining interior-facing 3.25in drive bay spare, along with two free 5.25in bays above.

Panrix was another company that had opted for the K56Flex modem, and its choice of sound card was the Orchid

Nusound 3D card. Panrix had also opted for the excellent AGP Viper 330 from Diamond, and the machine scored very well in our Final Reality 3D tests. Although the NT SYSmark scores were down on what we had expected, the Panrix scored very highly when running SYSmark in Windows 95.

The Iiyama Vision Master 450 monitor is a good choice. The OSD was simple to use and the focus on the screen was impressive, as were the available refresh rates. The colours were rich and sharp and the monitor and graphics card were able to offer a good 75Hz refresh rate even at 1600 x 1200 resolution.



PCW Details

Price £2,344 (£1,995 ex VAT)

Contact Panrix 01132 444958
www.panrix.co.uk

Good Points Lots of room for expansion. Large hard drive.

Bad Points Only 64Mb RAM.

Conclusion Should go like greased lightning.

Build Quality ★★★★★☆

Performance ★★★★★☆

Value for Money ★★★★★☆

Overall Rating ★★★★★☆

Roldec Predator XL

We had been expecting faster hard drive technologies than the Ultra DMA 2 interface so it was a disappointment, bearing in mind the price tag of these PCs, that more manufacturers had not taken the opportunity to supply faster technologies. Roldec was one of the few companies which managed to break the mould and so it was with delight that we first noticed the Ultra Wide SCSI hard controller in

one of the PCI slots. Ultra Wide SCSI offers far higher data transfer rates than that of UDMA2 and is better-suited to delivering multitasking on the disk. The hefty 9.1Gb Ultrastar 9ZX hard drive from IBM, is matched with 128Mb of SDRAM, running at the bus speed of 100MHz, leaving 2 DIMM slots free for further RAM. Roldec was the only company to have fitted both modem and network cards. As well as the Diamond Supra modem with its transfer rate of 56K, an Ethernet card was included.

There was no data storage hardware although there is an argument that such media is not necessary nowadays. For a small company, with only a handful of PCs, data storage drives like LS120 and Zip would be handy to back up records. But with a PC that is part of a large network, it gives the opportunity to keep information on a company's server, to retrieve when necessary.

The system scored well in both SYSmark tests and although the two scores are not strictly comparable, the Roldec results were interesting because it was the only PC in our test which scored better under Windows NT than under 95. If you are looking for a PC that flies through applications when running NT, the Roldec is definitely worth consideration.

The 19in EO90 monitor from Princeton gave an impressively sharp picture at a resolution of 1,024 x 768, combined with an excellent OSD. Even at its best resolution of 1,600 x 1,200, the highest refresh rate remained at a constant 75Hz.

Personal
Computer
World
Highly
Commended



PCW Details

Price £2,349 (£1,999 ex VAT)

Contact Roldec 01902 456464
www.roldec.co.uk

Good Points One of the few to include SCSI.

Bad Points No added storage device.

Conclusion An impressive performer.

Build Quality ★★★★★☆

Performance ★★★★★☆

Value for Money ★★★★★☆

Overall Rating ★★★★★☆

Windows NT 5.0: major changes to come

For many people, the July beta 2 of Windows NT 5.0 gives them the first real opportunity to assess the likely impact on their business plans. The limited technical release beta 1 which appeared last year was designed to get those with big investments in Windows NT thinking about the major changes to come when Windows NT 5.0 ships.

The areas that have been caused problems in Windows NT 4.0 have been primarily to do with management (domains are a pain when you have lots of them) and hardware support — or rather, the lack of it.

Windows users in business would switch their desktops to Windows NT Workstation in droves if it had full support for plug-and-play and power management, as does Windows 95/98 — well, it's coming in Windows NT 5.0 Workstation.

Software — better and better

From Windows NT Server, network managers are looking for better scalability (i.e. clustering that works) and better tools for managing large Windows NT networks. The good news is that they're going to get them. The bad news is that it's going to be a major learning exercise.

In code terms, Windows NT 5.0 is twice the size of Windows NT 4.0 and there are lots of new features: a directory service, a distributed file system, new security system, new storage systems, and new management and administration tools. Lots of old stuff like NetBEUI, WINS, and even domains begin to get phased out in Windows NT 5.0.

The Active Directory will, for the first time, provide a centralised Windows NT directory service and the Microsoft Management Console (MMC) will bring all of the disparate management utilities together under one interface, enabling network administrators to manage all the Windows NT servers and workstations on their NT networks from one centralised location. Implementing this vision is going to take some work as the existing domain management structure has first to be to be integrated and then assimilated into the new, unified, Active Directory.

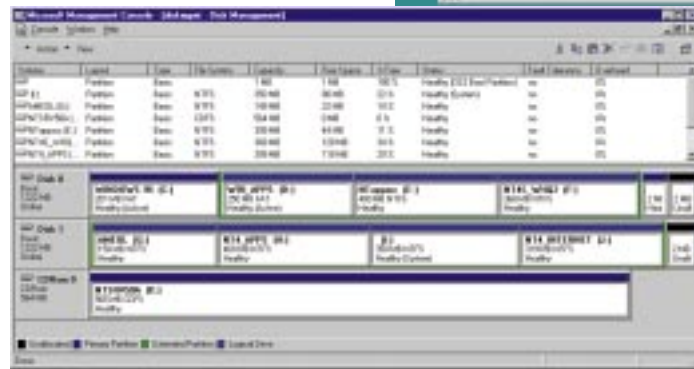
The Active Directory is a single directory source for all network objects, with a single point of administration and a system-wide

query ability based on object attributes. It works in conjunction with the distributed file system which enables multiple drives to be incorporated into a single logical volume.

Active Directory and the MMC, together with Zero Administration — which enables user workstations to be “locked-down” and self-healing (provided they are running Windows NT Workstation) — are going to attract most of the headlines but be warned; they're going to take some implementing and getting used to.

Hardware — managing OK

Running through the hardware enhancements is the management theme that applies throughout Windows NT 5.0. All the usual hardware gripes are answered. There's scanner support, integrated fax, better backup, better printing support, FAT32 support and a disk defragmentation utility at last. But the aim is always easier management,



Above The Management Console

Left The new Disk Administrator

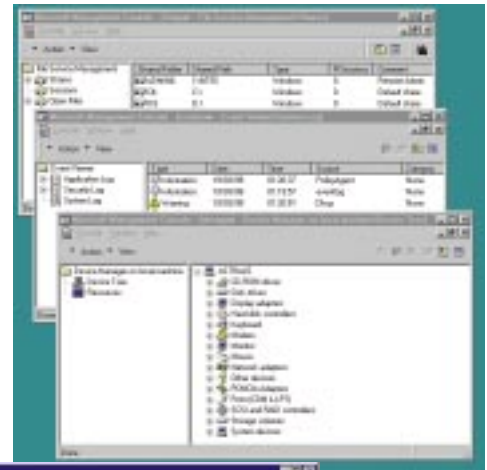
more automatic management, and more centralised management for administrators to reduce the cost of Windows NT networks.

Take the problem of having to reboot Windows NT after minor configuration changes. This is a nagging point on a desktop but a major issue on a server so we get dynamic storage management for Windows NT 5.0. Now we can add drives and configure new volumes without rebooting, and storage will be incorporated into Active Directory and accessible to remote management through the MMC.

We will at last get disk quotas to stop users from being wasteful of storage space and hierarchical storage management will retire old, unused files to archives, thus preventing disks from filling up.

New hardware support for hot-swapping PC Cards, plug-and-play hardware, power management

and new hardware technologies (USB, Fibre channel, I2O, DVD, Firewire IEEE1394, and SmartCards) does not only benefit end-users and mobile workers, it's a major advance for



support staff because NT 5.0 will now detect and automatically configure hardware both at initial setup time and when new peripherals are added.

The lack of power management in Windows NT has been especially troublesome, not only because it's a real pain to have no power management on portables, but because millions of “green” desktops running Windows NT Workstation 4.0 are unnecessarily consuming energy. Windows NT 5.0 promises to change all that and, as with many of the other new features, power management is built into the management system so that network administrators can decree that workstations take a nap when they fall idle, or stay awake in the evening to be backed up.

Will NT 5.0 make life easier?

Windows NT 5.0 is by no means going to be a simple upgrade roll-out. Once the new management features are in place and working and the inevitable bugs that appear in any new software have been ironed out — there's twice as much code in 5.0 as there was in 4.0 — there is no doubt that Windows NT 5.0 will make life easier for users and administrators. It is getting there from here that is going to keep the midnight oil flowing for a while.

Terence Green

Windows NT 5.0: the way to go?

If your company is wondering whether it is time to move from Windows 95/98 to Windows NT 5.0, the answer is “yes”. The only way to extract the full benefit from Windows NT 5.0 management is to run Windows NT 5.0 clients. Windows 95 and Windows 98 are just too unruly.

Alternatively, you might consider Windows CE clients. If you thought Windows CE was no more than a nifty way to discharge AA batteries in a hurry, then think again. Windows NT 5.0 will include Windows Terminal Server and manufacturers such as Wyse, Tektronix and Boundless, are pumping out low-cost Windows CE terminals. You hook these up to Windows NT 5.0 Server and run real 32-bit Windows applications, just like those show-off power users with their 500MHz Pentium IV whatsits. And, if you have a load of sluggish old 486s that you cannot even give away, you can attach those to Terminal Server, too.

Simply Power 400W

Most machines in this group test adhere to a similar configuration, with UDMA hard drives and tape or internal disk storage devices. Simply Computers had instead interpreted our request for a powerful office machine rather differently. Its Power 400W didn't have the archiving capability of others with their LS120 or Zip drives. Instead, a hefty 9.1Gb Seagate ST39173LC hard drive was provided which used the latest generation of SCSI devices, the new LVD (Low Voltage Differential) version of Ultra2. This allows for SCSI

connections of up to 12m as opposed to the normal limit of 2m.

The LVD Ultra2 drive with its maximum transfer rate of 80Mbps offers double the potential throughput of UltraWide SCSI at its maximum of 40Mbps. Its LVD motherboard also had a RAID port as an extension of one of the PCI slots, offering the option to put in a RAID controller. This opens up interesting options as it would allow the user to hook up and access more than one hard drive simultaneously. If you need server capabilities, or want to run powerful graphics packages, regularly retrieving very large files, you will benefit from the PC's ability to split the retrieval between two or more hard drives.

While this might serve a niche market very well, we thought the system had misjudged the average office user, for whom the RAID option would be less relevant.

The faster data retrieval on offer wasn't really tested by our benchmarks, so we couldn't easily judge performance

increases. Nevertheless, it would benefit users who need the speedy retrieval and caching of large files. While there were no conventional extra storage devices, Simply Computers had provided both Ethernet and modem for the option to store work on a server.

The Hitachi CM751ET 19in monitor gave an excellent picture with rich colours and sharp focus across its 18in viewable diagonal. When the monitor was set at its maximum resolution of 1600 x 1200 it maintained a refresh rate of 75Hz — truly impressive.



PCW Details

Price £2,349 (£1,999 ex VAT)

Contact Simply Computers 0181 4982140

www.simply.co.uk

Good Points Gives the power-hungry the head-room they need.

Bad Points Can't see it being a hit with the average office worker.

Conclusion A niche configuration for the upgrade-mad.

Build Quality ★★★★★

Performance ★★★★★

Value for Money ★★★★★

Overall Rating ★★★★★

Viglen C2 Plus 400

Viglen has a reputation for producing excellent machines, and the C2 Plus 400 was no exception. From a hardware point of view it was one of the most intriguing machines in this group test, and the best performer.

Apart from the massive 10.1Gb IBM hard drive using the UDMA2 interface and generous 128Mb SDRAM, there was the 3D Diamond Fire GL 1000 card with 8Mb of SGRAM. Rather than install a modem as the other manufacturers had done, Viglen

had fitted a 3Com "combo" Ethernet network card which had fittings for both Ethernet and token ring networks, with a data transfer rate of 10Mbps. This combination allows some flexibility for users or older networks to upgrade or enables those on mixed networks to standardise on one network card.

Whereas other OEMs in the group had plumped for Zip or LS120 drives, Viglen opted for a Hewlett-Packard Travan tape storage drive. It is possible to store 8Gb Compressed, or backup 4Gb uncompressed. An Imation Travan tape was included. Some of the other OEMs in this group included a free disk with their L120 and Zip drives but (while these are used for principally the same archiving function as a tape drive) their 100Mb or 120Mb is only a fraction of the potential 8Gb on offer with this tape.

The C2 Plus produced impressive results in our SYSmark and Final Reality tests. We had told manufacturers that we

were looking for powerful office machines,

optimised to run 2D applications, but the best machines in the group were those that scored well when running the Final Reality tests, too.

The Viglen-branded 1995UE CTX monitor gave an excellent picture, sharp and bright, with outstanding refresh rates, offering a vertical refresh rate of up to 100Hz when outputting 1024 x 768 resolution. The excellent OSD was also one of the most comprehensive we saw in this group test.



Personal
Computer
World
**Editor's
Choice**

PCW Details

Price £2349 (£1999 ex VAT)

Contact 0181 758 7000 www.viglen.co.uk

Good Points Very, very fast, with huge storage capabilities.

Bad Points No modem. No direct internet access possible.

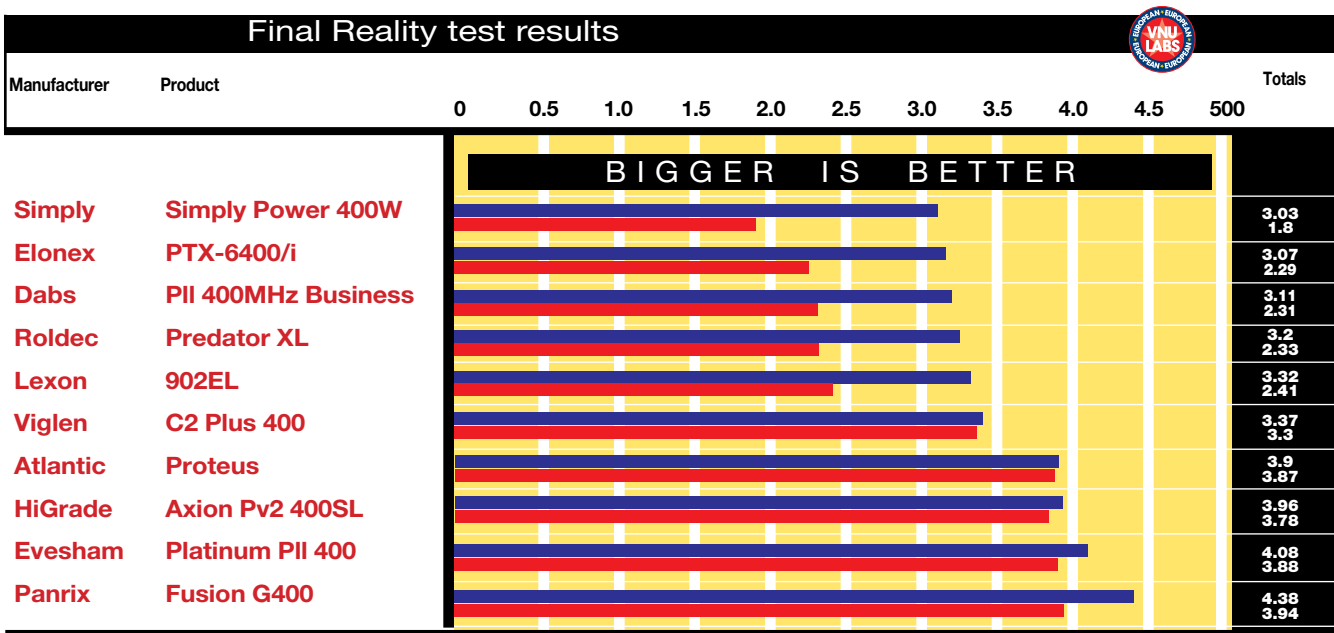
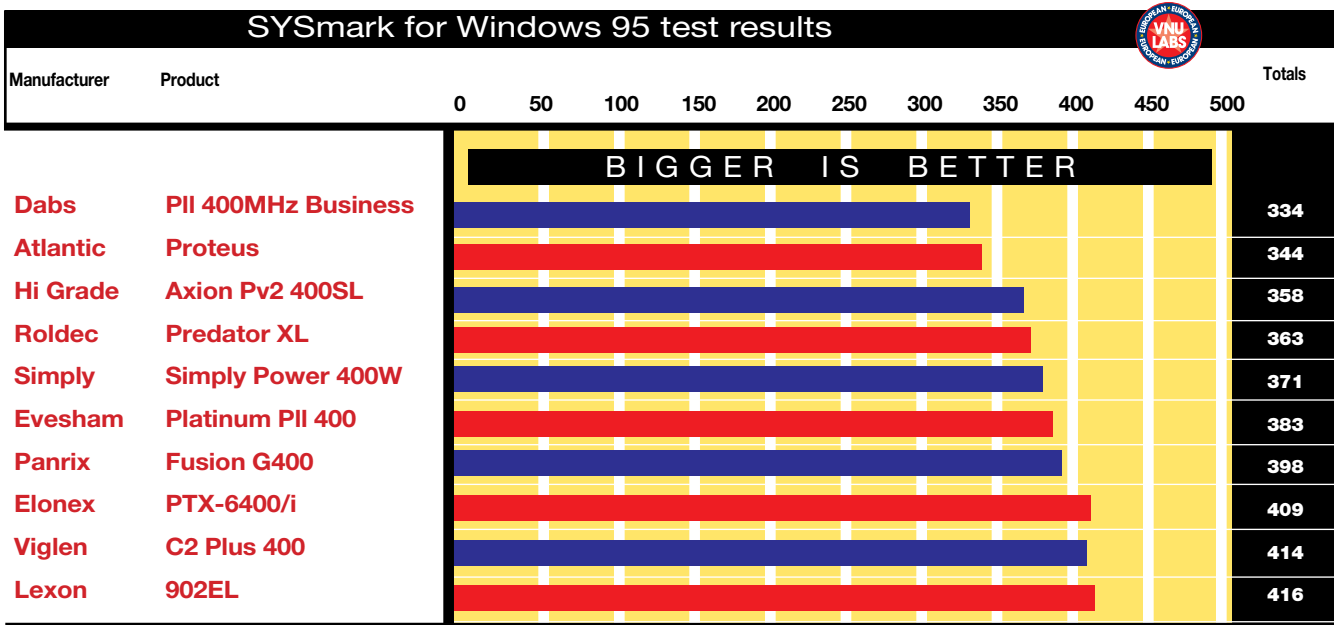
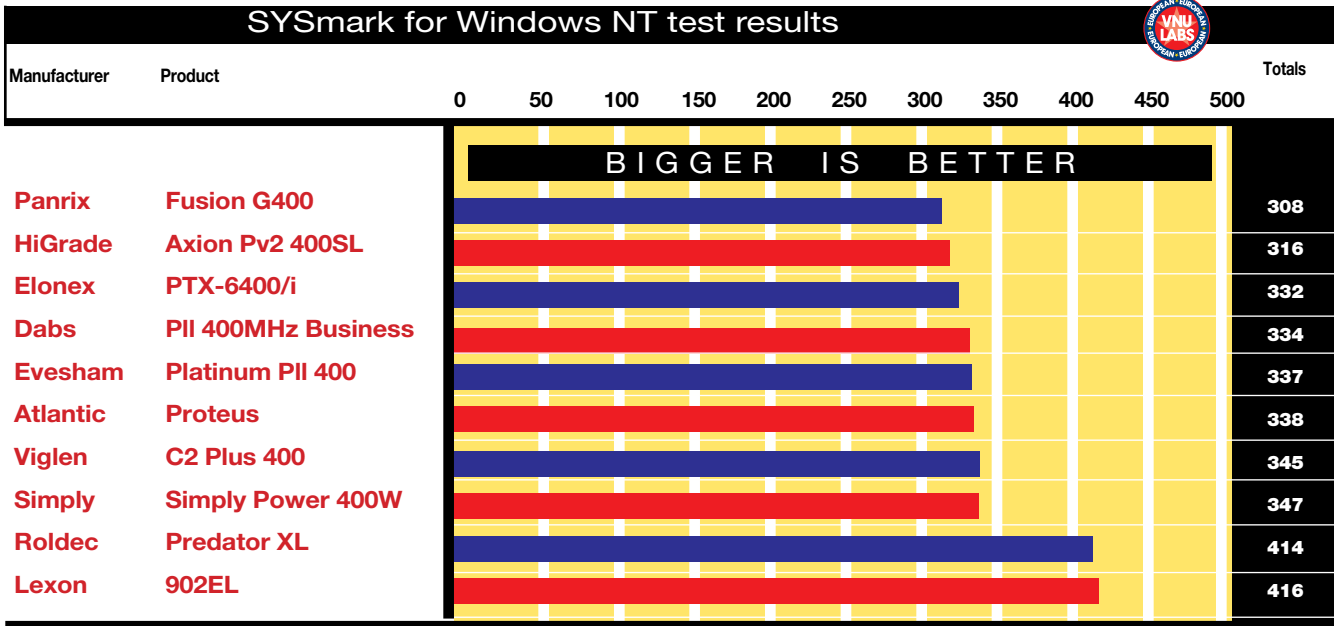
Conclusion If you want your apps to fly, look no further.

Build Quality ★★★★★

Performance ★★★★★

Value for Money ★★★★★

Overall Rating ★★★★★



Editor's Choice

For a PC reviewer, high-end group tests usually offer more intriguing systems than are to be found in the average basic PC. Manufacturers are keen to show off the expensive toys they would not otherwise be able to fit into a budget PC (DVD-ROM and SCSI hard drives, for instance) although the more complex the system, the greater the potential for technical headaches.

We went for the dual-boot option because we thought it an interesting use of the massive hard drives and processing power at our disposal in a high-end machine. Although OS convergence is on the way (see page 151) it is still quite a way off. Both operating systems offer advantages and drawbacks over the other, with the stability of NT weighing against Windows' much better compatibility with hardware. (For more details, see page 146.)

The major problem facing OEMs was trying to load Windows 95 in a FAT format that NT would recognise so that there would be no partition problems as NT itself was installed. In other words, the drive had to be formatted as FAT16, Windows 95 was installed, then Windows NT and any adjustments made to the partition formats after that.

NT also has problems with hardware devices being set up if some are using SCSI and some are using IDE. As a result, manufacturers throughout Britain were cursing PCW in the weeks leading up to the delivery date for the group-test PCs, trying to resolve the problems of system stability caused by the dual boot setup.

If you are desperate for a dual-boot machine direct from an OEM, bear in mind that you will be paying for two OS licences (Microsoft very rarely gets requests from their OEMs for dual-licensed machines). Some manufacturers build a dual-install machine which, the first time you boot up the system, lets you choose which of the two operating systems is to be installed, then deletes the other one. Alternatively, you could try partitioning your own PC and installing the two operating systems yourself (see page 146).

Most companies in this group test seem to have made a straight choice between SCSI hardware with its fast transfer and hefty price tag, or a greater amount of IDE hardware like Zip drives, and tape storage. If they made the second choice, they were not so generous with connectivity hardware (specifically, modems and network cards). You should consider where most of your archived data is kept. If your files are stored on a network, internal data storage devices will be less relevant and you should concentrate on whether the PC you choose has sufficient network capabilities.

We were impressed by the Hi-Grade PC, for example, with both a SCSI hard drive and an LS120 drive, although if you need to hook this machine up to a network you will need to pay more for a network card. In the end we went for machines we thought were best suited to an office environment, which means that tough choices ultimately had to be made. Evesham Micros, for example, submitted an



excellent PC with an impressive DVD drive and great test results, but its lack of a network card and storage devices ultimately counted against it. If you're after a PC for speed you can't really go wrong with the Lexon PC, which only narrowly missed out on a Highly Commended.

The first **Highly Commended** award goes to **Roldec** for its excellent **Predator XL**, one of the few machines to be fitted with a SCSI drive coupled with both a 56K modem and an ethernet card. The XL scored respectably when running the SYSmark 2D tests in Windows 95, and got the best results we saw of any machine running the tests in NT.



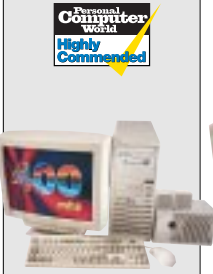


The **Elonex PTX-6400/i** is also **Highly Commended**. It managed great all-round test results combined with a generous package of hardware, including tape storage, modem and network card. Optimised for 2D performance it flew through our SYSmark tests, but also scored well in the 3D Final Reality tests. We had stressed the importance of 2D performance, and only a handful of PCs achieved good scores on both SYSmark and Final Reality tests. Although we never judge machines purely on performance, it is safe to say that this plays a major part in choosing a winner.

The **Editor's Choice**, then, for this group test is the **Viglen C2 Plus 400**, which scored superb results in both SYSmark and Final Reality tests. It offered huge storage capabilities, with one of the largest hard drives on offer — a 10.1Gb monster from IBM. With a tape drive that can offer 8Gb of compressed data per tape, this is a PC to satisfy the most app-happy user. The Viglen system as a whole was impressive, with excellent graphics card, network combo card and superb monitor.

Power play: the Viglen C2 Plus 400 (above), the Roldec Predator XL (below, left) and the Elonex PTX-6400/i (below)








Table of Features

					
Manufacturer	Atlantic Systems	Dabs Direct	Elonex	Evesham Micros	Hi-Grade
Model	Proteus	PII 400MHz Business	PTX-6400/i	Platinum PII 400	Axion Pv2-400SL
Price inc VAT	£2,349	£1,899	£2,203	£1,996	£1,995
Price ex VAT	£1,999	£2,231	£1,875	£1,699	£2,349
Telephone	0990 134725	0800 558866	0181 452 4444	0800 4960800	0181 532 6123
Fax	01639 821300	0800 1297000	0181 452 6422	01386 765354	0181 532 6110
URL	www.atlanticsystems.com	www.dabs.com	www.elonex.co.uk	www.evesham.com	www.higrade.com
Standard warranty	1yr pts+lab/4yrs lab. only	1yr on-site	1yr RTB	2yrs on-site	1yr on-site
Warranty options	5yrs pts/lab	5yrs on-site	5yrs on-site	upgrade to 3yrs	upgrade to 2yrs
Hardware Spec					
Processor	PII 400MHz	PII 400MHz	PII 400MHz	PII 400MHz	PII 400MHz
RAM	128Mb	128Mb	128Mb	128Mb	64Mb
RAM type	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM
Hard disk	IBM DHEA - 3845	Seagate Medalist	IBM DHEA-38451	Seagate Medalist	IBM Ultrastar
Size(Gb)/Interface	8.4Gb/UDMA	9.1Gb/UDMA	8.4Gb/UDMA	9.1Gb/UDMA	9.1Gb/SCSI2 UW
Motherboard Components					
Motherboard	Intel 440BX	Intel 440BX	Microstar 6116	Chaintech 6BTM	Asus P2B-LS
Chipset	Intel 440BX	Intel 440BX	Intel 440BX	Intel 440BX	Intel 440BX
L2 cache	512Kb	512Kb	512Kb	512Kb	512Kb
BIOS type	Phoenix	Phoenix	AMI	Award	Award
BIOS Revision	6.0	6.0	v1.1	v040998	v4.51PG
Expansion and I/O					
Spare bays 3.5in/5.25in	1/2	2/3	2/1	2/2	1/1
AGP slots	1	1	1	1	1
PCI slots/ISA slots/shared slots	4/2/1	4/2/1	4/2/1	4/3/1	4/2/1
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	Creative Labs DVD drive	Asustek	Panasonic	Panasonic	TEAC CD5325
				DVD-ROM SR8582	
Speed/Interface	DVDx2/IDE	34x/EIDE	32x/IDE	2x/IDE	32x/SCSI 2
Sound card	Creative Labs	Crystal	Videologic	Creative Labs	Genius
Sound card model	AWE64	On-board	Sonic Storm	AWE64	Soundmaker 3DFX
Speakers	Atlantic OEM/500W	Typhoon 120W	CSW100	Yamaha YST-M525	-
Graphics & Monitor					
Graphics card	Ati Xpert@Work	Matrox G100	Matrox G100	Ati Xpert@Work	Ati Xpert 98
RAM/Max RAM	8Mb/8Mb/SGRAM	8Mb/8Mb/SDRAM	8Mb/8Mb/SDRAM	8Mb/8Mb/SGRAM	8Mb/8Mb/SDRAM
Monitor model	Mag DJ 800	Adi 6P	Ilyama Visionmaster	Taxan 975	Ilyama Visionmaster
			450		450
Monitor size	19in	19in	19in	19in	19in
Max refresh at 1,024 x 768 (NI)	100Hz	85Hz	100Hz	117Hz	120Hz
Other information					
Modem speed	56K	56K	56K (PCI)	56K	n/a
			3Com 905		Intel Etherexpress
Other extras	lomega Zip100	lomega Zip100	BTX Ethernet	Creative Labs DVD	Pro100/4
	Headset microphone	3com network card	HP Travan tape drive		
Software	Lotus SmartSuite	MS OfficeSBE	MS Office SBE		Lotus SmartSuite
	AGP Enhanced bundle		Intel LANdesk		
	IBM Simply Speaking				
	IBM AntiVirus				
Year 2000 compliant?	●	●	●	●	●

Key: ● Yes ○ No

Table of Features

					
Manufacturer	Lexon	Panrix	Roldec	Simply Computers	Viglen
Model	Lexon 902EL	Fusion G400	Predator XL 400MHz	Simply Power 400W	C2 Plus 400
Price inc VAT	£1,795	£1,995	£1,999	£1,999	£1,999
Price ex VAT	£2,109	£2,344	£2,349	£2,349	£2,349
Telephone	0181 667 1173	01132 444958	01902 456464	0181 498 2140	0181 758 7000
Fax	0181 667 1134	01132 444958	01902 452592	0181 523 4002	0181 758 7000
URL	www.lexonpc.com	www.panrix.com	www.roldec.com	www.simply.co.uk	www.viglen.co.uk
Standard warranty	2yrs pts+lab RTB	1yr on-site	1yr pts+lab	5yr RTB	1yr RTB
Warranty options	5yrs on-site	2yrs	upgrade to on-site	upgrade to on-site	upgrade to 4hr response
Hardware Spec					
Processor	PII 400MHz	PII 400MHz	PII 400MHz	PII 400MHz	PII 400MHz
RAM	128Mb	64Mb	128Mb	64Mb	128Mb
RAM type	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM	PC100 SDRAM
Hard disk	Seagate Medalist	IBM DTTA	IBM Ultrastar	Seagate ST39173LC	IBM Deskstar14GXP
Size(Gb)/Interface	9.1Gb/UDMA	10.1Gb/UDMA	9.1Gb/UltraWide SCSI	9.1Gb SCSI2 LVD	10.1Gb/UDMA
Motherboard Components					
Motherboard	Supermicro BX6	Asustek P2B	Elitegroup B6BXA	Supermicro P6SBS	Viglen OEM Vig67
Chipset	Intel 440BX	Intel 440BX	Intel 440BX	Intel 440BX	Intel 440BX
L2 cache	512Kb	512Kb	512Kb	512Kb	512Kb
BIOS type	AMI	Award	Award	AMI	Award
BIOS revision	v1.05	v2.0	v4.51PG	v1.1	v1.0
Expansion and I/O					
Spare bays 3.5in/5.25in	1/2	0/2	1/1	0/2	1/0
AGP slots	1	1	1	1	1
PCI slots/ISA slots/shared slots	4/1/1	4/2/1	5/2/1	4/3/1	4/3/1
USB/serial/parallel/PS2	2/2/1/1	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
Multimedia					
CD-ROM	Lite-on/32	Asus 34x	Fic 32x	Simply	Panasonic CR586
Speed/Interface	32x/IDE	34x/IDE	32x/EIDE	32x/EIDE	32x/EIDE
Sound card	Creative Labs	Orchid	n/a	Pine 16bit	Viglen Multiwave
Sound card model	AWE64	Nusound 3D	n/a	Schubert	PCI Wavetable
				Labtec	
Speakers	Juster	Yamaha M20	n/a	2420+Subwoofer	Yamaha M15
Graphics & Monitor					
Graphics card	Matrox G100	Diamond Viper 330	Matrox G100	Matrox Millenium II	Diamond Fire GL1000
Graphics card RAM/Max RAM	8Mb/8Mb/SGRAM	4Mb/4Mb/SGRAM	8Mb/8Mb/SGRAM	4Mb/8Mb/SGRAM	8Mb/8Mb/SGRAM
Monitor model	Mag XJ900T	Iiyama Visionmaster 450	Princeton EO9019	Hitachi CM751	Envy 19D
Monitor size	19in	19in	19in	19in	19in
Max refresh at 1,024 x 768 (NI)	100Hz	100Hz	90Hz	100Hz	120Hz
Other Information					
Modem speed	56K	56K	56K	56K	n/a
	Modular Premier			100 baseTX	3Com PCI 3C900
Other extras	56EL	lomega Zip100	Diamond Fireport 40	Network card	combo card
			3com 3C90SD		T400 IDE Tape Drive
			PC Check		
Software	MS Office Pro 97	Lotus Smartsuite	Diagnostics	MS Works	MS Office SBE
	VDOphone for Videoconferencing			Antivirus and Rescue Me	
Year 2000 compliant?	●	●	●	●	●

Key: ● Yes ○ No

Peripheral **vision**



A flatbed scanner could be the most useful peripheral you ever buy for less than £100. Here, we put scanner technology in the picture and put eight of the latest models through their paces.

Who would have believed that flatbed scanners could end up costing less than £100? Better still, it's possible to buy a perfectly respectable model from £70. But with such a variety available, which should you choose? Over the following pages we've put eight flatbed scanners through their paces which, despite carrying a budget price, offer highly respectable performance.

A flatbed scanner can capture colour pictures, documents, pages from books and magazines and, with the right attachments, can even scan transparent photographic film. Using cunning software they can read pages of words and convert them into editable text documents, saving you from all that tiresome typing. Photographic images can be scanned and manipulated in all manner of ways, from retouching the scratches and marks of time, to adding a comedy moustache to Uncle Bob's photo for that perfect family Christmas card! Perhaps you'd like to have your logo scanned so you can place it on your business cards and letterheads? And what about getting images onto your web site? Whatever the

application, a scanner will end up being one of the most useful and versatile peripherals you've ever bought. And with prices this cheap, there's no need to delay.

If you want to find out which scanners won our editor's awards, jump straight to the conclusion on page 178. For those who want the lowdown on how scanners work, the issues surrounding today's models, our reviews of each product and the most detailed scanner tests we've ever published, then start here.

● Contributors

Ajith Ram, Gordon Laing and Ian Robson

Budget scanners Contents

- 172 Agfa SnapScan 310P
- 172 Apollo Express 3
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- 174 HP ScanJet 5100C
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Ratings

- ★★★★★ Buy while stocks last
- ★★★★☆ Great buy
- ★★★★☆ Good buy
- ★★★★☆ Shop around
- ★★★★☆ Not recommended

What you should know about scanners

The output of a scanner is far more difficult to measure than that of an inkjet or laser printer. In addition to understanding the importance of resolution and colour depth, the buyer should also consider the versatility of the supplied drivers, manuals, image editing and OCR software that come bundled with them.

Inside story

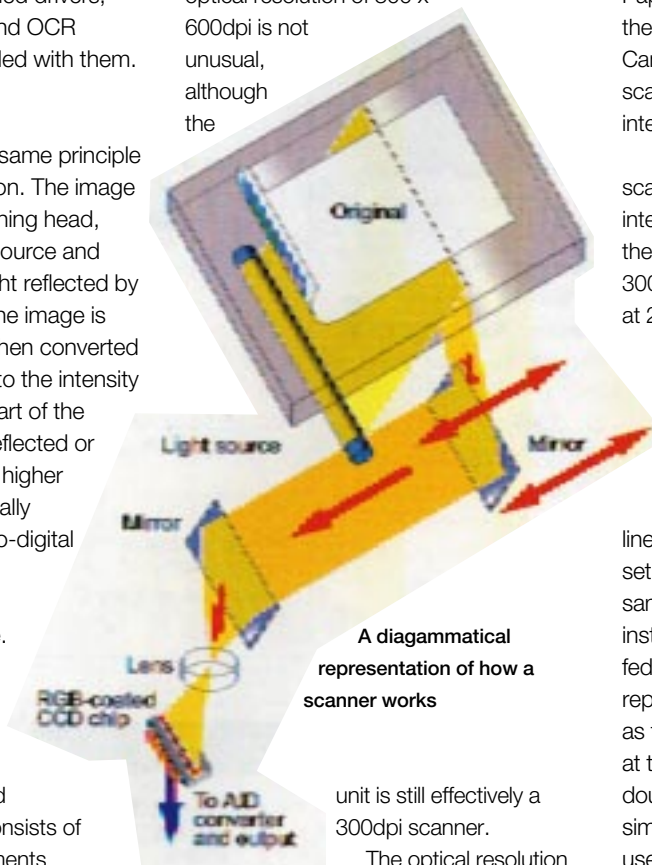
All scanners work on the same principle of reflection or transmission. The image is placed before the scanning head, which consists of a light source and sensor. The amount of light reflected by (or transmitted through) the image is gathered by the sensor, then converted to a voltage proportional to the intensity of light: the brighter the part of the image, the more light is reflected or transmitted, resulting in a higher voltage. This voltage is finally converted by an analog-to-digital converter into bits of information which the computer can manipulate.

The sensor used in desktop scanners is a charge-coupled device, or CCD. The same device is used in video and digital cameras. A CCD consists of many photo-sensitive elements arranged in a grid in the case of a video or digital camera, or in a long, thin line in the case of desktop scanners. The more photo-sensitive elements per unit length, the higher its resolution.

A desktop scanner claiming a horizontal optical resolution of 300dpi and a maximum document width of 8ins will have 8 x 300 resolution: that is 2400 light-sensitive elements on the CCD. Most colour desktop scanning heads contain a single fluorescent-tube light source with three such CCDs filtered for red, green and blue light. These allow the scanner to capture a full-colour image in a single pass.

The vertical resolution of a desktop scanner is dictated by the degree of fineness with which the scanning head can be physically directed over the image. In the case of a flatbed scanner, the head is driven by a stepper motor; a device which

turns a predefined amount and no more each time an electrical pulse is fed. It is common for the maximum vertical resolution to exceed the horizontal resolution thanks to the stepper motor being highly geared. Therefore, a quoted optical resolution of 300 x 600dpi is not unusual, although the



unit is still effectively a 300dpi scanner.

The optical resolution represents the maximum

resolution of the CCD and the stepper motor as described above. It is however possible for the apparent resolution to be increased using a technique known as interpolation which, under software or hardware control, guesses intermediate values and inserts them between real ones. Some scanners do this much more effectively than others, and as our results show, two scanners claiming the same figures do not necessarily produce the same output.

Understanding resolution

There is a common misunderstanding that a higher resolution results in a better-quality output. This has led to manufacturers making exaggerated claims about the capabilities of even their cheapest scanners. And these claims are

most often based on interpolation.

All but one scanner in this group test had a maximum optical resolution of 300dpi; the Epson boasted 400dpi. The maximum interpolated resolutions ranged between 2400dpi, offered by the Visioneer Paperport 3100, and 9600dpi offered by the Umax Astra 610P and the Canon CanoScan 310. Four of the eight scanners here offered a maximum interpolated resolution of 9600dpi.

One crucial factor to consider while scanning at very high resolutions, interpolated or otherwise, is the file size of the final output. A full-colour A4 image at 300dpi measures 25Mb, while colour A4 at 2000dpi runs to over a gigabyte!

High and low

Clearly there are times when you should and should not use high scanning resolutions. When

scanning and printing monochrome line-art images such as logos, you should set your scanner resolution to be the same as that of your printer; so, for instance, a 300dpi laser printer should be fed 300dpi scans of line-art. This is for reproducing the image at the same size as the original. If you want to reproduce it at twice the size, you'll need to use double the resolution (say, 600dpi) and similarly for reproduction at half the size, use half the resolution (say, 150dpi).

Scanning in colour

Colour scanning is a different story. Since most colour printers need to lay down several of their own dots to simulate the effect of a single full-colour scanned dot, you can often get away with much lower resolutions than you would otherwise think. For example, we scan at only 300dpi for the pages of *PCW*, while most colour inkjets are happy with scans of 150dpi. Again, if you want to double the size of your scanned original, you should double the scanning resolution.

Consequently, you only really need high scanning resolutions in order to greatly enlarge small original images. It's still worth bearing in mind that line-art uses one bit of information per pixel, while full-colour employs 24 bits per pixel: that's why a full-colour image file is 24 times

bigger than a monochrome version at the same resolution. Since large file sizes will really slow down your PC, it is wise to carefully consider what resolution you should be using rather than mistakenly assuming that the highest setting is best.

The colour spectrum

As important as a scanner's resolution, is its ability to capture a wide range of colours and shades. The range captured by a scanner is down to the dynamic range of the analog-to-digital converter, along with the purity of the illuminating light and coloured filters and any system noise. In theory, a 24-bit scanner offers an 8-bit range (256 levels) for each primary colour. The difference between adjacent levels of colour in a scale of 256 is commonly accepted to be indiscernible to the human eye.

Unfortunately, a few of the least significant bits are often lost in "noise", while any post-scanning tonal corrections reduce the range still further. It's best to make all your brightness and colour corrections in one go, from the scanner driver, before making the final scan itself.

More expensive 30- or 36-bit scanners have a much wider range to start with, offering better detail in the shadow and light areas, allowing you to make tonal corrections and still end up with a decent 24-bit scan at the end. Three of the scanners in our group test claimed 30-bit colour depth, with the remaining five offering a conventional 24 bits.

TWAIN devices

Scanners are accessed under Windows using software known as a TWAIN driver (usually supplied). Although TWAIN is not an acronym, it is a very important standard in image acquisition where only one driver file is required for each device. Developers only need to make their applications TWAIN compliant and they will be able to access and control any installed TWAIN devices; it is similar to how a Windows printer driver works.

To activate a TWAIN device you should select the Acquire option in the File menu of an application such as Photoshop. The user would then be prompted to select a suitable TWAIN source, after which the



Parallel port scanners usually feature a "pass-through" connector for daisy-chaining a printer

computer will launch the device's dedicated driver, all without leaving the main application. After scanning, the driver automatically closes, leaving the scanned image open in the main application. This image can then be manipulated freely.

Different drivers

Not all TWAIN drivers are the same. All offer a preview which quickly displays a small representation of the image to be digitised. From here, the scanning area may be adjusted along with the resolution and colour depth. Better TWAIN drivers offer a high degree of overall image adjustment such as brightness, contrast and colour, and often some kind of automatic exposure. The most sophisticated may link to colour management systems (see our *Hands On Workshop*, page 214) and offer de-screening for scanning photos out of magazines or newspapers.

SCSI or parallel?

One important aspect to check out while buying a scanner is whether it is a SCSI or a parallel port device. Each has its own advantages and disadvantages.

SCSI scanners are often much faster than their parallel counterparts and usually come bundled with a SCSI card which the buyer will have to install inside the computer. Although the best SCSI cards can support several internal or external SCSI devices, the cheap cards that come bundled with the scanners are usually designed just to support one external device (i.e. the scanner with which it was

sold). Also, these bundled SCSI cards are slow ISA models designed merely to get you connected and nothing more.

For the best performance and flexibility, consider buying and fitting a decent PCI SCSI card. First-time PC buyers may want to consider a SCSI-based system to start with, offering them the option to connect additional SCSI devices such as scanners without hassle.

For non-technical users, a parallel scanner is the best solution as it simply connects to your external parallel port. One thing to look for in such a scanner is a pass-through printer port. This will allow you to plug your printer and scanner into the same PC parallel port and avoid the need for switching them each time one is used.

Ports of call

Even parallel port scanners vary in their versatility, as some of them will work only with modern enhanced parallel ports. A computer bought within the last two years is likely to have an enhanced parallel port, but the enhanced port will not work at its peak capacity until it has been set up properly in the PC's BIOS.

All the parallel port scanners we tested worked best with enhanced parallel ports and were additionally fitted with a pass-through printer port. SCSI scanners are generally much faster than their parallel counterparts although the interface only affects speed, not image quality.

Over the next few months we can look forward to scanners which easily connect to modern USB ports.

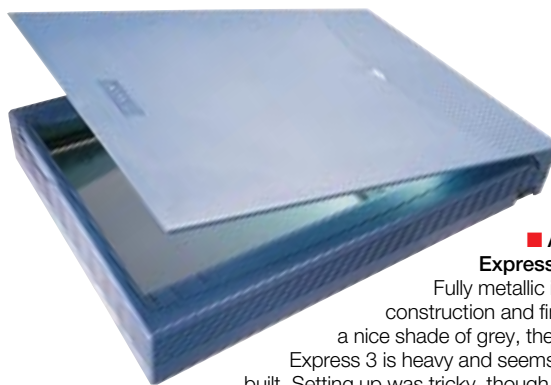


Agfa SnapScan 310P

Agfa has bundled its first parallel port scanner with a good collection of software which includes Ulead PhotoExpress and OmniPage LE, but the model with which we were supplied proved problematic to set up. The bundled FotoScan driver insisted on looking only for a SCSI scanner and wouldn't recognise the parallel model which was connected. So, Agfa supplied new TWAIN driver files which solved the problem.

After this, the scanning process went without a hitch and the user interface proved to be friendly and flexible. The SnapScan output was among the best in the group with excellent reproduction of detail at both ends of the colour spectrum. The reproduction of greyscales was also equally impressive with very little bleeding.

★★★★★



Apollo Express 3

Fully metallic in construction and finished in a nice shade of grey, the Apollo Express 3 is heavy and seems well built. Setting up was tricky, though, since the supplied ISA SCSI card wouldn't work in our PC. In the end we resorted to using an Adaptec PCI SCSI card for testing.

Scan times were fast, with a full-page preview taking just six seconds: the use of a decent third-party SCSI card certainly did no harm in this respect. The quality of the colour image was quite good with plenty of detail in the bright highlight areas. Greyscale scanning was much less impressive however, and plain text reproduction even less so.

★★★★★



Canon CanoScan FB310

This is a very lightweight parallel port scanner that is easy to set up and use. It comes bundled with Ulead's iPhotoExpress, OmniPage LE and a useful tutorial on scanning.

The installation of the driver was easy. The Canon was the only one in our group test that gave the choice of two completely different software interfaces: a basic one for the average user who wants a fast scan using the default settings, and the other for the more advanced user.

The FB310 produced mixed results. Although the colour range extended well into dark and bright details, its greyscale scanning was less than optimal with poor separation between adjacent levels. The results of our text test were average.

★★★★★



Epson GT 5500

The GT 5500 looks unremarkable but is solidly built. It can also boast of being one of the easiest SCSI scanners we've set up. The enclosed SCSI card slid into the PC's ISA slot with the minimum of fuss and the scanner drivers, provided on a floppy disk, installed easily.

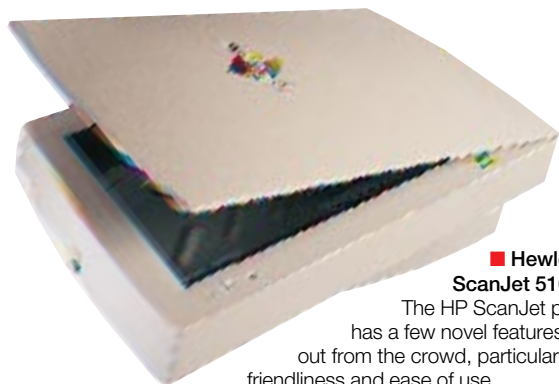
The software bundled with the scanner included Adobe PhotoDeluxe, OmniPage LE and Presto PageManager. Epson had also enclosed an excellent book on advanced scanning methods and image manipulation.

Although faster than many others, the GT 5500 produced only average results with detail lacking in both the dark and highlighted areas of the colour image. Performance in our text test was disappointing, too.

★★★★★

Table of Features		Personal Computer World Highly Commended		
Manufacturer	Agfa	Apollo	Canon	Epson
Model	SnapScan 310P	Express 3	CanoScan FB310	GT 5500
Optical Resolution	300dpi	300dpi	300dpi	400dpi
Interpolated Resolution	9600dpi	9600dpi	9600dpi	3200dpi
Colour Depth	30-bit	30-bit	30-bit	30-bit
Max Scanning Area	A4	A4	A4	A4
Retouching Software	Ulead PhotoExpress	ImagePais 2	Ulead PhotoExpress	Adobe PhotoDeluxe
OCR Software	OmniPage LE	Easyreader	OmniPage LE	OmniPage LE
Interface	EPP	SCSI	EPP	SCSI
Transparency Option	○	●	○	○
Dimensions	445x330x105mm	426x292x65mm	260x399x73mm	443x297x87mm
RRP inc VAT	£116.50	£128	£151.50	£242
Street Price inc VAT	£116.50	£128	£151.50	£160
Supplier	Agfa	Teco Information Systems	Canon	Epson
Telephone	0181 231 4200	0161 876 8762	0121 680 8062	0800 289622
Web Address	www.agfahome.com	www.teco-info.com.tw	www.canon.co.uk	www.epson.co.uk

Key: ● Yes ○ No



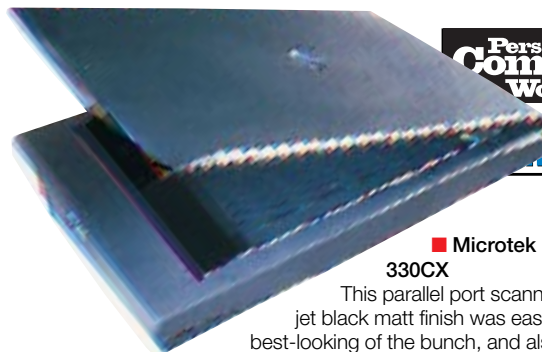
■ Hewlett-Packard ScanJet 5100C

The HP ScanJet parallel port scanner has a few novel features that help it stand out from the crowd, particularly in terms of user-friendliness and ease of use.

The PrecisionScan driver offers the extremely useful function of simple monitor calibration: display settings vary from monitor to monitor, hence an image that has been perfectly scanned may appear less than ideal on a poorly set-up monitor. The PrecisionScan driver also cunningly scanned the hard disk and noted all the software that could be used to present scanned images.

The 5100C's final output showed good detail in the highlighted areas but was lacking in the darker regions. Text reproduction was of acceptable quality.

★★★★☆



■ Microtek Phantom 330CX

This parallel port scanner with its jet black matt finish was easily the best-looking of the bunch, and also extremely light and easy to set up. The Phantom comes with a good bundle of image editing and OCR software which includes Ulead's PhotoAssistant, PhotoExpress and OmniPage LE. The Microtek EasyScan driver comes on a separate CD and is easy to install. During the installation process, the driver checks the computer for an enhanced parallel port. It correctly detected ours and configured it for optimum use.

The Phantom produced good colour tones in the dark areas but was found wanting in the highlighted areas. Reproduction of text in colour was also disappointing.

★★★★☆



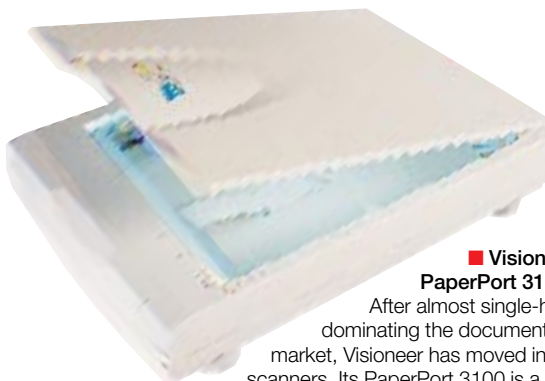
■ Umax Astra 610P

The 610P has few distinguishing physical features. It is a lightweight, 30-bit, parallel port scanner which is easy to set up. The enclosed third-party software includes Adobe PhotoDeluxe, Presto PageManager and Presto PhotoAlbum. The driver immediately recognised the scanner and presented a

colourful user interface which offered adjustable controls for colour, contrast and brightness. Scanning itself was hassle-free.

The Astra produced the best overall results in our colour test, with broad detail in the shadow and highlighted areas. The reproduction of greyscales was not quite so impressive nor as precise as the Agfa SnapScan, but the Astra almost obliterated the competition in its overall text results, particularly so in terms of colour.

★★★★★



■ Visioneer PaperPort 3100

After almost single-handedly dominating the document scanner market, Visioneer has moved into flatbed scanners. Its PaperPort 3100 is a very plain-looking scanner, with little to distinguish it from other flatbeds on the market. Setting it up was relatively easy, though, with all the drivers and third-party software bundled on a single CD.

The drivers immediately recognised the scanner on rebooting. Despite being a parallel port device, the Visioneer was fast. However, the quality of the final image left much to be desired with an evident lack of detail in the shadow regions. Individual grey levels were also poorly resolved, while performance in our text test was nothing to write home about.

★★★★☆

Table of Features		Personal Computer World Highly Recommended	Personal Computer World Editor's Choice
Manufacturer	Hewlett-Packard	Microtek	Umax
Model	ScanJet 5100C	Phantom 330CX	Astra 610P
Optical Resolution	300dpi	300dpi	300dpi
Interpolated Resolution	2400dpi	4800dpi	4800dpi
Colour Depth	30-bit	30-bit	30-bit
Max Scanning Area	A4	A4	A4
Retouching Software	Adobe PhotoDeluxe	Ulead PhotoExpress	Adobe PhotoDeluxe
OCR Software	OmniPage LE	OmniPage LE	Presto PageManager
Interface	EPP	EPP	EPP
Transparency Option	○	○	○
Dimensions	485x300x124mm	416x264x43mm	420x295x100mm
RRP inc VAT	£234	£75.95	£69.33
Street Price inc VAT	£234	£75.95	£69.33
Supplier	Hewlett-Packard	Microtek UK	IMC
Telephone	0990 474747	01908 317797	01344 871329
Web Address	www.hp-cpo.com	www.microtek.com	www.umax.co.uk

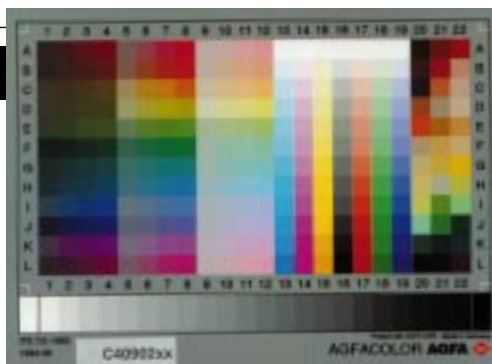
Key: ● Yes ○ No



How we did the tests

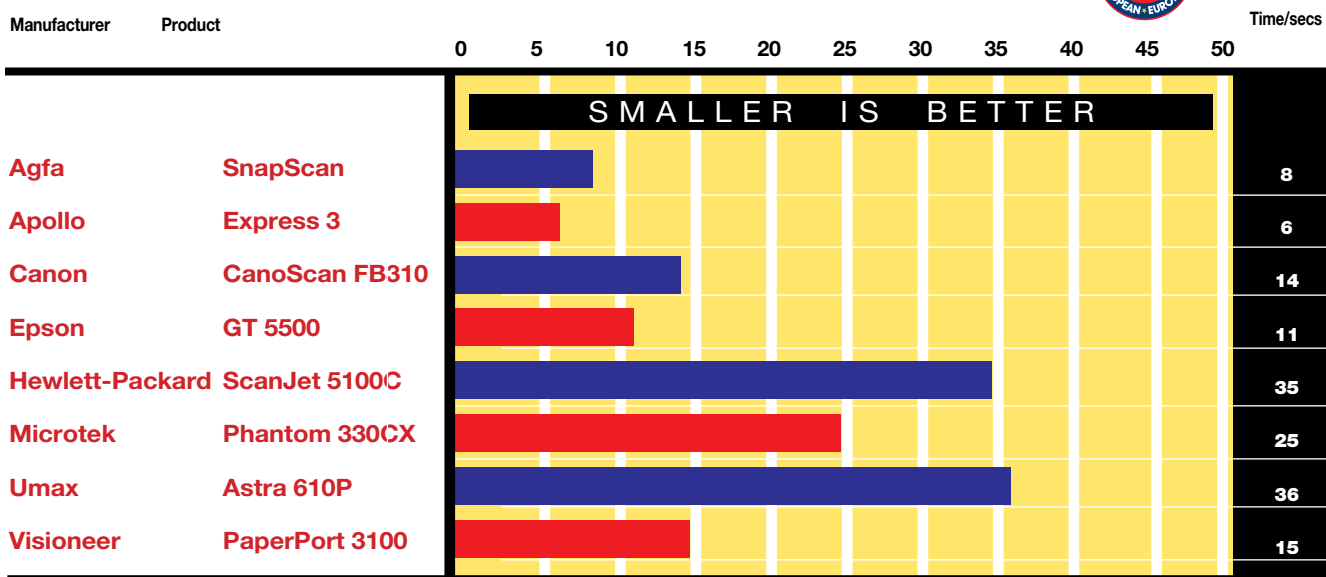
We connected each of the eight scanners, one at a time, to a 400MHz PII with 64Mb RAM. The six parallel scanners were connected to the PC's enhanced parallel port, while the two SCSI models were connected using the supplied ISA SCSI cards. We couldn't get the Apollo's SCSI card to work in our PC, so we used an Adaptec PCI SCSI card instead. The cheap SCSI cards supplied with scanners are usually only able to support one external device, so anyone wanting the flexibility of SCSI should consider investing in a decent PCI SCSI card. We scanned an A5 Agfa IT-8 test target at 150dpi (see the image, right). While it is possible to tweak a scanner's settings for the best results, this can be tricky and time consuming, so we have based our conclusions

on the raw scans most users will make. If the supplied TWAIN driver offered a single-click auto-exposure or auto-adjustment feature, we used it; otherwise we tested each scanner's out-of-the-box performance. Using Photoshop's histogram facility we analysed the colour and greyscale portions of the IT-8 target. The histograms (page 177) reveal a scanner's tonal range, undesirable clipping or absence of

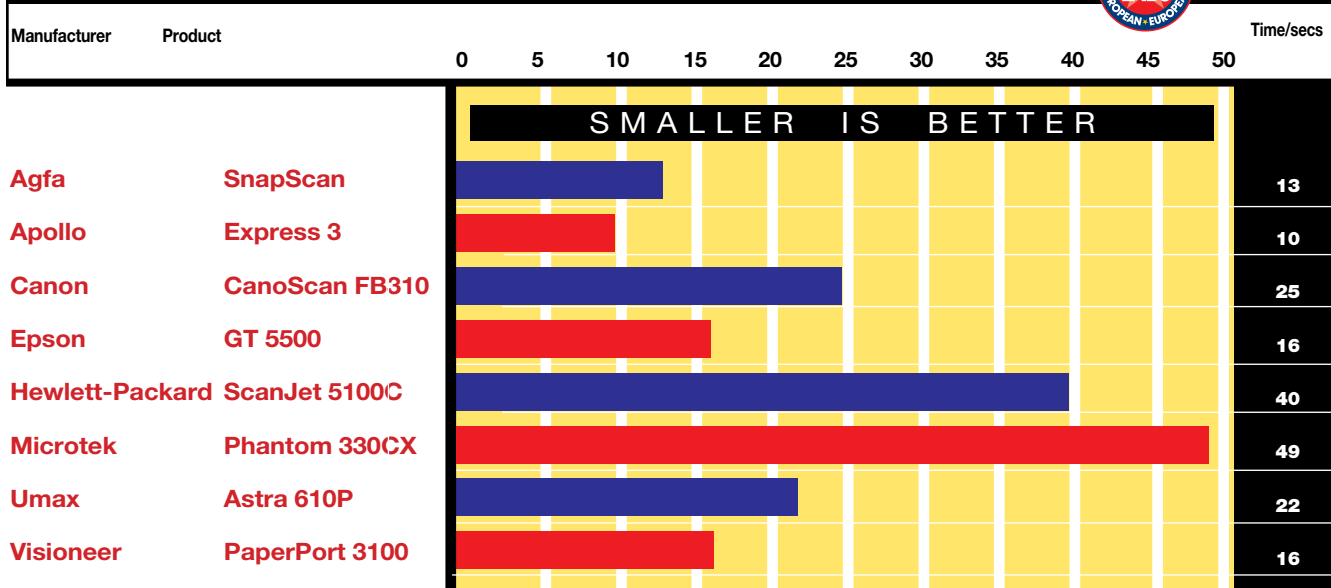


detail in the shadow or highlight regions while also revealing any problematic gaps. Resolving power was tested by scanning a tiny (6pt) letter g in monochrome at the highest optical and highest interpolated resolution claimed by each unit (page 176). We also scanned the same character in colour at the optical resolution to demonstrate the scanner's colour convergence. Additionally we timed how long it took for each flatbed to make an A4 colour preview and scan the A5 target in 24-bit colour at 150dpi.

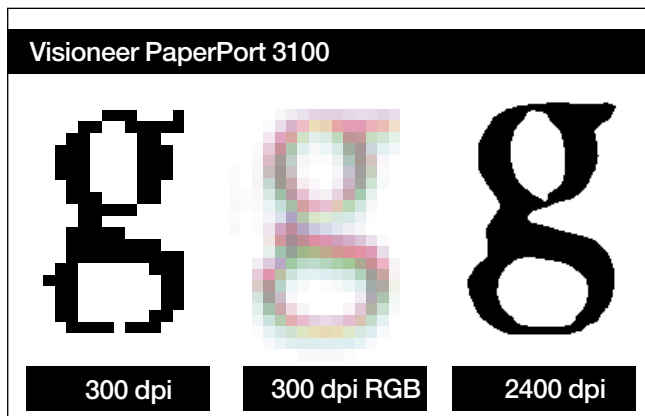
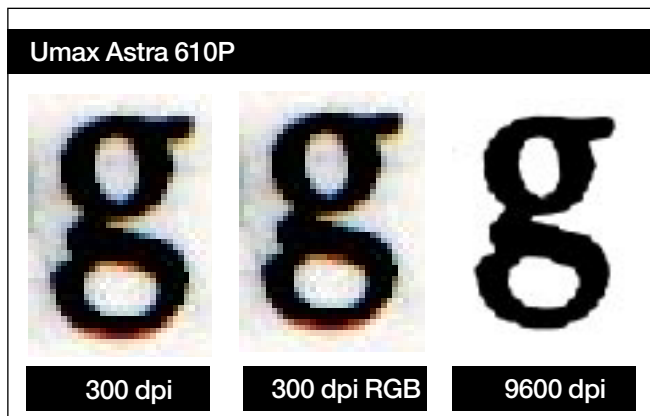
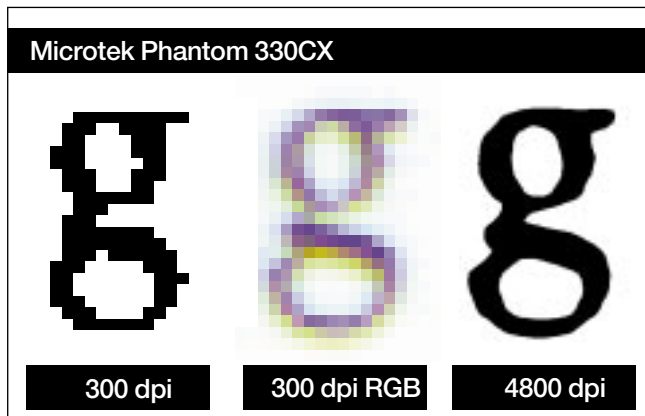
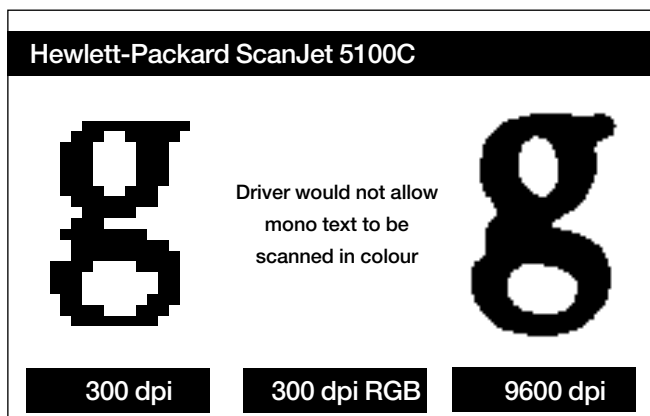
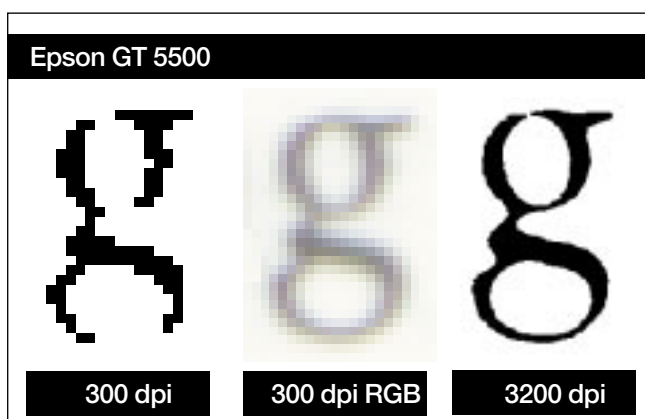
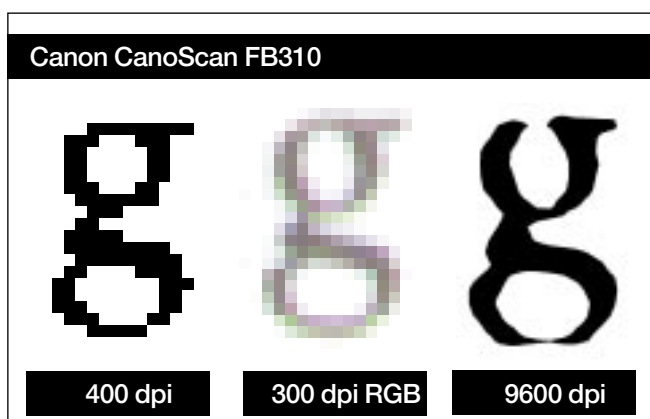
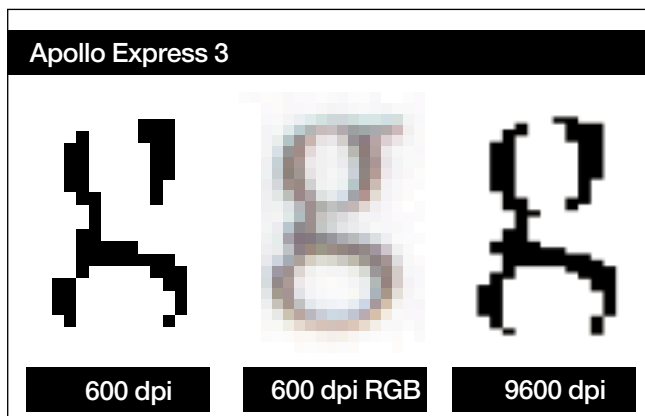
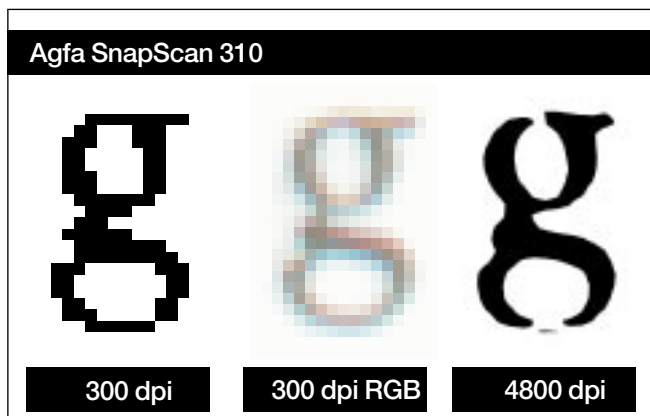
Speed of A5 150dpi scan



Speed of A4 preview



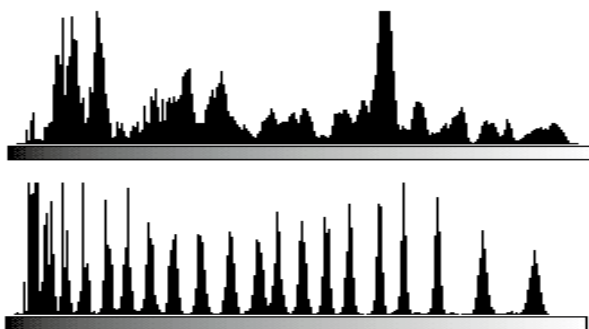
Resolving-power results (optical, colour and interpolated)



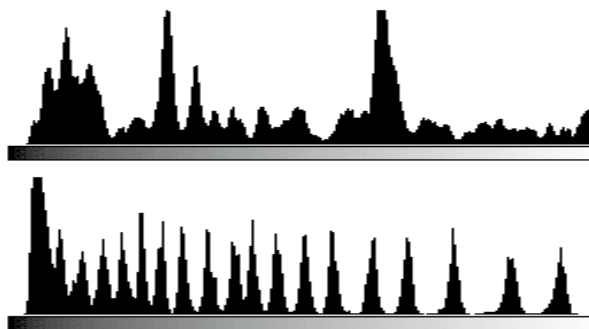
The true resolution of a scanner is its optical resolution, usually measuring 300 or 600 dpi. The scanner firmware or software can interpolate or "make up" in-between values to effectively increase the resolution. This can only smooth edges, not invent detail that was never captured. We scanned the same tiny character (1mm) on each model three times and reproduce them side by side above. Optical resolution in B&W (left), then in RGB colour (middle), followed by highest interpolated resolution in B&W (right). Notice the huge difference in quality, and the often meaningless figures quoted by manufacturers. Fringes in the colour result indicate a lack of convergence that would reduce the quality of detailed colour scans.

Colour (top) and greyscale (bottom) results

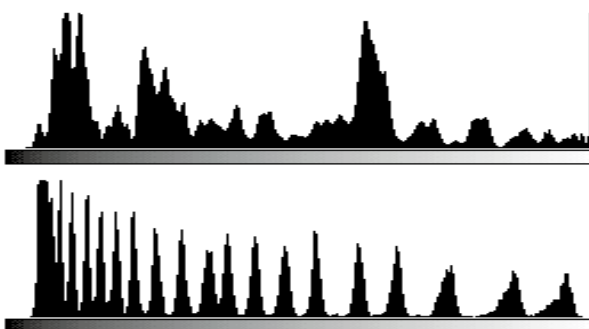
Agfa SnapScan 310



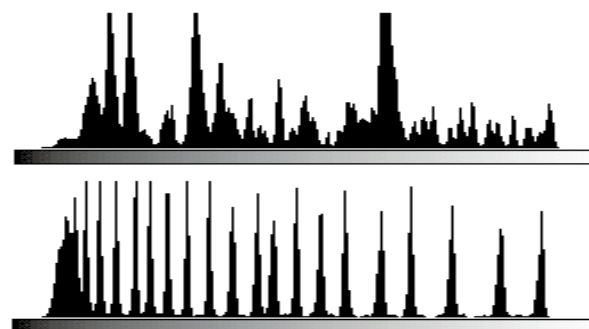
Apollo Express 3



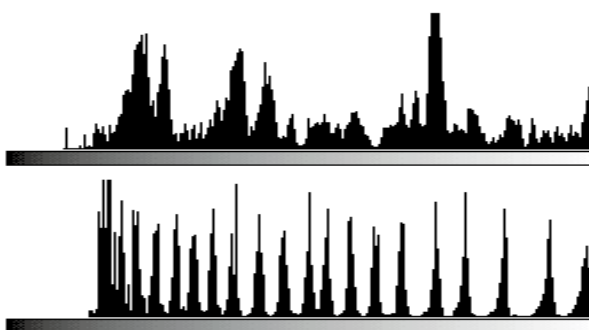
Canon CanoScan FB310



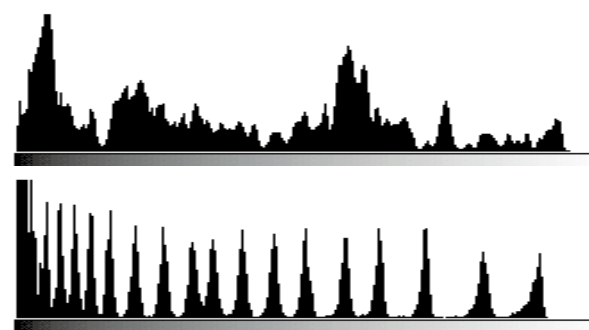
Epson GT 5500



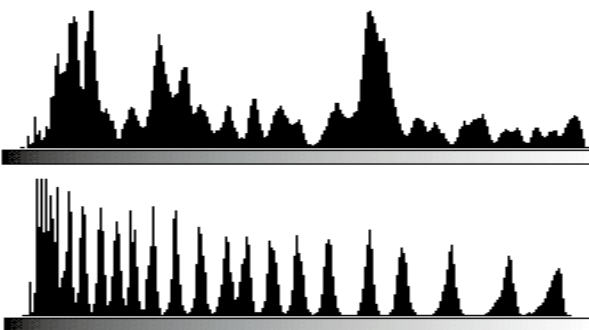
Hewlett-Packard ScanJet 5100C



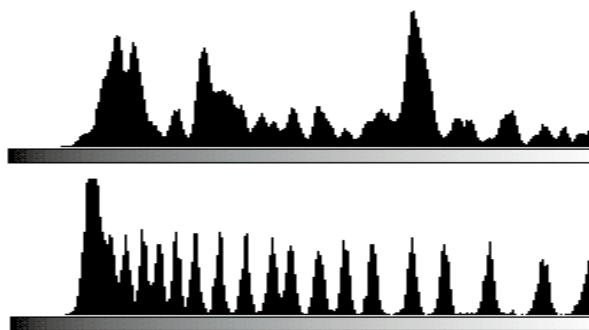
Microtek Phantom 330CX



Umax Astra 610P



Visioneer PaperPort 3100



One 24-bit scanner may capture a wider range of colours than another, and in some cases a 30-bit model won't necessarily produce a better result. We scanned an industry standard Agfa IT-8 test target on each model using its automatic settings. The IT-8 consists of a grid of colours and a strip with 21 distinct greyscales. Using Adobe Photoshop's histogram tool we analysed the coloured and greyscale sections separately. The top graph represents the range of colours captured, which should ideally slope off smoothly at the extreme ends. Where it falls short at the left or right sides, shadow or highlight details respectively are being lost. The lower graph should ideally show 21 sharp, thin and evenly spaced peaks; the reality indicates the actual number of greyscales resolved and the lack of resolution in the shadow areas.

Editor's Choice



Just two or three years ago most scanners cost at least twice the current price, and one that connected to a PC's parallel port would have been considered quite unusual. SCSI was the interface you had to deal with in the absence of a pre-installed card, and you had to open up your PC and get your hands dirty. But now, a scanner which connects to your PC's external parallel port is becoming increasingly common. Prices have plummeted too, with many models giving you change from £100, even after VAT is added. One PC parallel port may not be the same as another. Most of today's parallel port scanners will only work with so-called enhanced parallel ports, found on PCs typically less than two years old. Scanners connected to older PCs without enhanced parallel ports may operate more slowly, or not at all.

In our group test, the Microtek driver was the only one that tested our PC for both conventional and enhanced parallel ports, and unambiguously demonstrated that it could work with either. The Agfa SnapScan and the Canon CanoScan clearly stated in their documentation that enhanced parallel ports were needed.

All the scanners in this group test are recommended for use under Windows 95 or Windows NT. Users of earlier versions of Windows should contact the manufacturer for compatibility details.

SCSI scanners pose problems beyond actually having to open your PC. The SCSI system may, theoretically, allow several internal and external devices to be daisy-chained from a single card, but those cards supplied with SCSI scanners are normally limited in their facilities. The cheap ISA SCSI cards supplied with

the two SCSI scanners here could only support one external device (i.e. the scanner with which it was supplied).

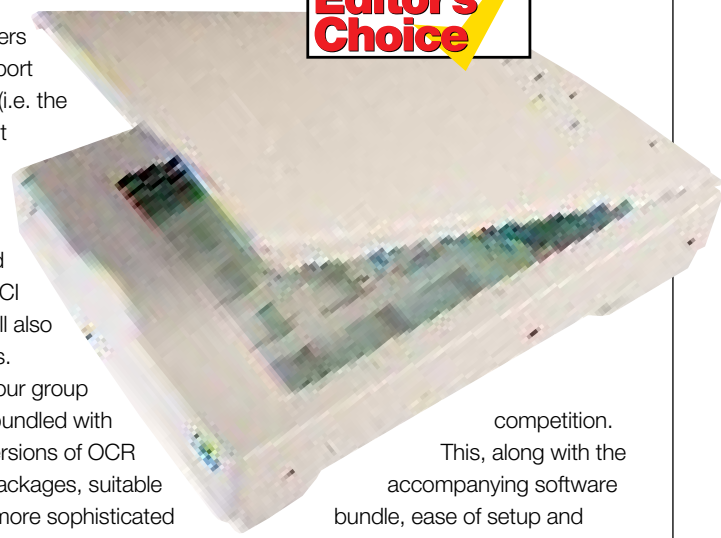
Those wishing to daisy-chain multiple SCSI devices should consider a decent PCI SCSI card, which will also show speed benefits.

The scanners in our group test typically came bundled with cut-down or "lite" versions of OCR and image editing packages, suitable for basic work. For more sophisticated users there is often the option to upgrade to the full versions at a considerably lower price than going out and buying the software separately — often a good enough reason for buying a scanner in the first place.

A brief word on more expensive scanners. If you want to greatly enlarge very small images, you should consider spending more money for a scanner with a high optical resolution of 600dpi or even 1200dpi. Pricier scanners should also capture a wider range of colours and shades, which is essential if you want to get the maximum detail from images with very dark or very light areas.

Overall, we were very impressed with the quality offered by budget flatbed scanners, with our recommended models offering sufficient quality and versatility for most users.

The **Umax Astra 610P** is **Editor's Choice**. While turning in very respectable scanning times, it produced superior colour images and above average greyscale results. Its performance in our colour text test was miles ahead of the

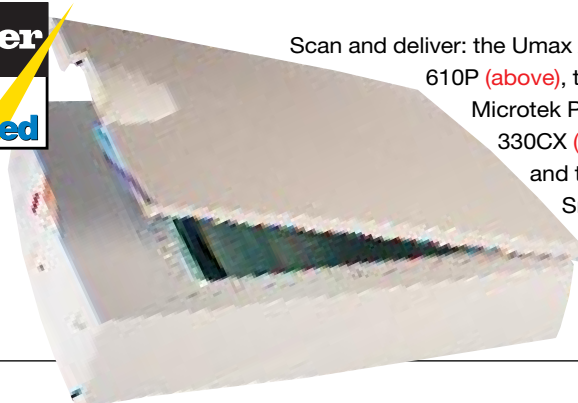
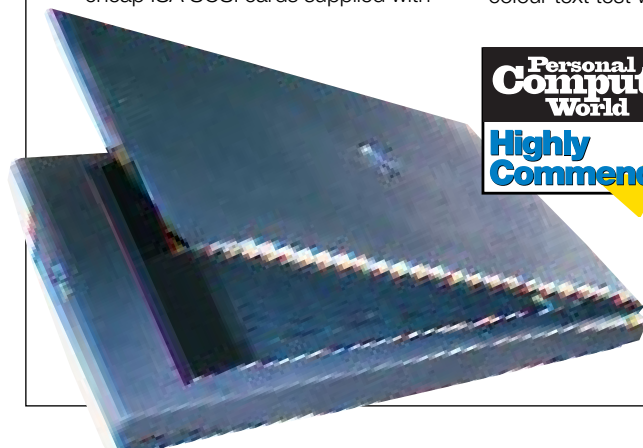


competition. This, along with the accompanying software bundle, ease of setup and competitive pricing make it an excellent budget scanner.

Although we had problems with the supplied drivers, the **Agfa SnapScan 310P** produced exceedingly good results, particularly in terms of our greyscale test, outclassing even the Umax Astra 610P. However, costing a little more than the Umax, the Agfa was just pipped at the post and comes **Highly Commended**.

Having the smallest footprint among the scanners we tested, along with being the cheapest and the best looking, the **Microtek Phantom 330CX** is also **Highly Commended**. It produced respectable image quality in both colour and greyscale tests, and it comes with an enticing bundle of image editing and OCR software.

The Hewlett-Packard ScanJet, although producing relatively disappointing results, has some novel features. In addition to being the scanner with the most user-friendly and versatile setup process, it has a driver interface colourful enough to ease the trepidation in the mind of the first-time user. Certainly a good choice for the beginner.



Scan and deliver: the Umax Astra 610P (above), the Microtek Phantom 330CX (far left) and the Agfa SnapScan 310P (left)



34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76

Think **ink**

The quality of text and graphics output is scrutinised as we put twelve inkjets through some rigorous testing. The proof is in the printing, as Nik Rawlinson reveals.

There has never been a shortage of inkjet printers from which to choose — the range has always been good. But the various printing technologies are subject to constant improvement, and the piezo, thermal and micro-dry processes are each elbowing for their own niche and proclaiming themselves the best available while, simultaneously, the choice of printers gets wider and the prices continue to fall.

New developments in ink production allow some manufacturers to boast of more vibrant colours and fade-resistant output, while others specialise in meeting the needs of particular market sectors such as photo reproduction or A3 paper handling. Although all the printers submitted for this review were put through the same rigorous testing procedures, we have divided the twelve models into four primary groupings: photo printers, A3, budget, and small office.

Each had to prove its ability to produce clean, crisp text output as well as bright, vibrant graphics and images on a range of paper stock. As many manufacturers still seem to be directing their efforts at targeting specific markets rather than producing a solid all-round contender, this proved quite a test for some. Each printer's work was timed and samples of each one's output have been included in all of their Technicolor glory for your own personal scrutiny.

We also feature an in-depth analysis of the technology behind thermal inkjet, piezo electric and microdry technology and two pages on proofing printers, to gain all-round coverage of all major sectors of the market, ranging from high to low-end products.

So, if you're looking to replace your current printer or you're just about to invest in your first inkjet, see how these twelve contenders performed under *PCW*'s no-holds-barred testing.

Inkjet printers Contents

185	Canon BJC-250
185	Lexmark 1000 Color Jetprinter
185	Olivetti JP190
186	Canon BJC-4300
186	Epson Stylus Color 850
186	HP DeskJet 890C
188	Epson Stylus Photo 700
188	HP DeskJet 720C
188	Lexmark 5700
189	Canon BJC-4650
189	Epson Stylus Photo EX
189	HP DeskJet 1120C
183	How inkjet printers work
192	Print samples
194	Performance graphs
196	High-quality colour printing
198	Table of features
199	Editor's Choice

Ratings

★★★★★	Buy while stocks last
★★★★☆	Great buy
★★★☆☆	Good buy
★★☆☆☆	Shop around
★☆☆☆☆	Not recommended

Inkjet printers: how they work

Careful examination of the product shots in each review of this group test should reveal that each image is made up of hundreds of tiny dots of cyan, magenta, yellow and black (or CMYK, as it is often abbreviated) ink. From a distance the human eye cannot see the individual dots, and when we're talking about dots of the size produced by an inkjet, then the printer need only be capable of placing 130 within the space of an inch to fool the human eye into thinking it is an area of continuous tone.

Most of the inkjets in this test were able to print at least 600 dots per inch (dpi) and the Epsoms are able to print at 1440 dpi, although the other manufacturers claim that the human eye is unable to tell the difference between 600 and 1400 dpi.

Setting the tone

Most inkjet printers hold two cartridges, one containing black ink and the other with three chambers for the cyan, magenta and yellow. Some printers also employ a replaceable photo cartridge with half-strength cyan and magenta tones, allowing this weaker ink to be put onto the page instead of leaving larger gaps or white paper between the dots — the method formerly used to print lighter colours. This allows for more graduated tones, mimicking the graduated tones of a photograph, and many printers incorporating this technology are labelled "photo" printers or "photo realistic".

When testing — and using — these

photo printers, *PCW* looks to ensure that the photos they produce are realistic and as close to the original image as possible, especially in terms of colour matching. Skin colours are particularly difficult to reproduce and so these are a key feature of our tests, while we also check to see which models leave the least number of white patches between the dots, instead filling the gaps with the lighter-coloured inks.

The two main technologies

When it comes to actually getting the ink onto the pages, there are two main technologies — Epson's Piezo Electric, and the more traditional thermal method. The vast majority of inkjet printers use thermal inkjet technology, where the printheads contain a small resistor that rapidly heats the ink to around 100°C within a millionth of a second, causing it to expand. The expanded ink bursts from the nozzle and onto the page. As the resistor cools, more ink flows into the chamber and the process is ready to begin again.

Crystal tips

Some argue that this means the ink must be engineered to withstand high temperatures to the detriment of ensuring the ink produces vibrant colours on the page. Piezo Electric technology avoids this criticism by doing away with the need for heat. Tiny crystals inside the printhead change shape when an electrical current is passed through them, which in turn physically expels the ink from the shrinking chamber.

Home and dry

Although not technically inkjet, microdry technology often finds itself appended to the end of this category. In truth, it is more akin to dye sublimation printers (see pp192/193). Holding four tapes, each with the colour held onto plastic strips like an audio or video cassette, these printers melt the ink onto the page one colour at a time.

It generally takes no longer to print a photo than a more conventional inkjet, but it has the benefit of offering genuine continuous tone — paper coverage without any gaps. It also allows for the use of metallic colours and even white for printing on coloured media.

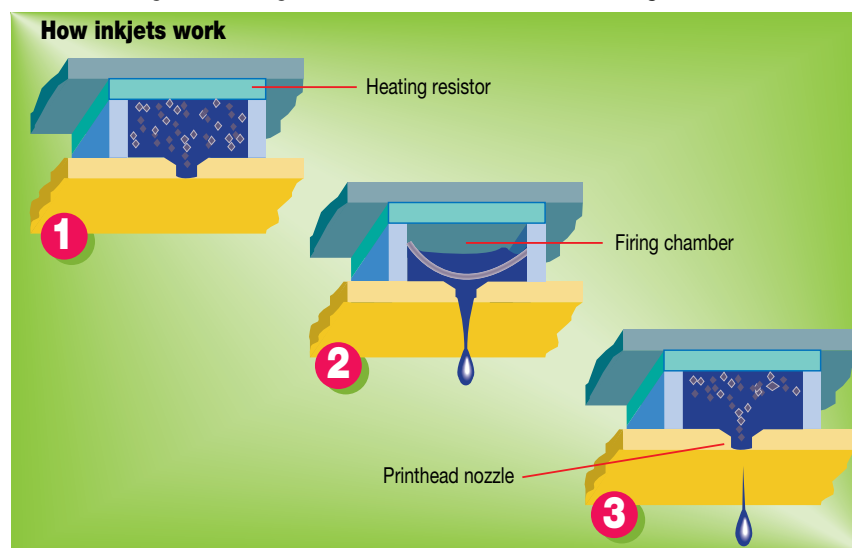
In most cases, a printer's primary use will be for reproducing text. Characters should be crisp and well defined, so ensuring the edges of the letters are not feathered is vitally important. It is also essential that a printer copes with a wide variety of font sizes: the internal curves of rounded letters should be well formed, and while characters as small as 4pt should still be easy to read, large characters should have uniform densities and not be characterised by puddles of ink in some parts while other areas are lighter.

Buying on a budget

By and large, budget printers are designed to handle a lower capacity than small-office models. Priced at around £100, they will certainly have less features in the way of paper-handling options and often a lower resolution. They are, however, ideal for light home use. Small-office printers are more likely to have a larger paper capacity (for both input and output), a higher resolution and a wider selection of cartridges.

Running costs

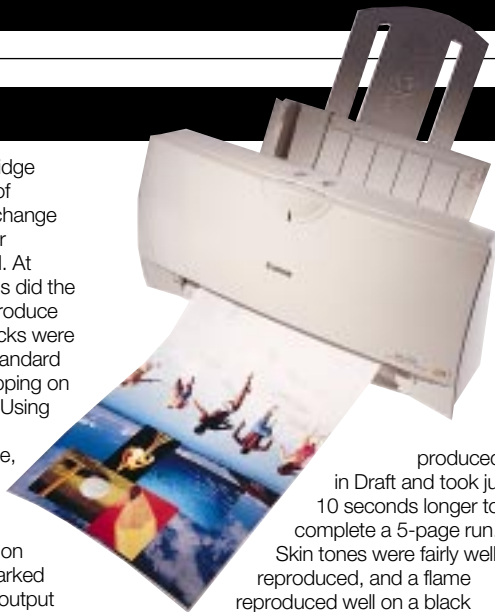
Many cartridges are available only from the manufacturers of your model; with a monopolistic hold on their sector, it's a seller's market. The cost of refills or replacement cartridges is something that should be carefully weighed up. A heavy printload on a cheap printer using expensive ink could work out more costly in the long run than a bigger initial outlay with lower-priced consumables.



BUDGET PRINTERS

Canon BJC-250

The BJC-250 held only one cartridge which meant a certain amount of swapping when we wanted to change from colour (CMY) to black. The printer detected which cartridge was installed. At neither High nor Normal quality settings did the business graphics test manage to reproduce the inverse hairline, although CMY blocks were realistic tones, if a little speckled. At Standard quality banding appeared and the stepping on our fades became more pronounced. Using photocopy paper and at a reasonable speed of just under 2 minutes per page, high-quality text output was feathered and suffered from a slight lack of density. Standard quality was fairly disappointing with variable ink density on larger characters, although it was a marked improvement on the grey and willowy output



produced in Draft and took just 10 seconds longer to complete a 5-page run. Skin tones were fairly well reproduced, and a flame reproduced well on a black

background with no bleeding from the darker composite black into the lighter areas at the edge of the yellow image.

Personal
Computer
World

Highly
Commended

PCW Details

Price £116.33 (£99 ex VAT)

Contact Canon 0121 680 8062
www.canon.co.uk

Good Points Fairly good print in most areas. Cartridge-type detection.

Bad Points Quality of text print.

Conclusion Best of the budget bunch.

★★★★★

Lexmark 1000 Color Jetprinter

A neat one-cartridge printer, the 1000 Color Jetprinter will fit easily onto a shelf or even the top of a PC's tower case. We were disappointed that it did not have a support for the paper input stack, which was left to dangle over the back. Leaving it in place for some time resulted in curved pages. Printed pages were delivered straight to the desk. The standard package does not include a mono cartridge, black output being composite from the CMY cartridge included in the box. The composite black was a fair reproduction although the results it achieved were feathered and not particularly solid. Replacing this with a black cartridge improved the results greatly and reduced the printing time by up to two thirds. Our A4 photo was poorly handled. Taking



a yawn-inducing 26 minutes to complete, it was very speckled and contained small blocks of black that were not evident in the original. The transition between yellow and composite black was also unclear. On Lexmark's inkjet paper, however,

business graphics output was some of the best we saw, with barely any evidence of stepping in fading tones, and it made a competent stab at the reverse hairline.

PCW Details

Price £99 (£81.70 ex VAT)

Contact Lexmark International 01628 481500
www.lexmark.co.uk

Good Points Excellent business graphics.

Bad Points Artifacts in photo output. No paper in supporter.

Conclusion Good for the price.

★★★★★

Olivetti JP190

Barely larger than a toaster, the single-cartridge JP190 would fit nicely on any desk. The odour from its output could be offputting, though. Using Olivetti's own photo paper to reproduce our A4 photograph, the dark and very grainy results had a distinctively burnt smell to them. Draft-quality print was very poor. Text was grey and fuzzy with pixels badly misaligned, although it was produced impressively fast at just 1 minute 46 seconds for 5 pages. That said, the 4pt text was readable and for proof-reading purposes this output level should suffice. Presentation and Standard-quality text output was very obviously feathered and we would have been reluctant to use this printer to produce reports or CVs. In presentation mode, completing the first of its five pages in 1 minute 26 seconds, it was unable to



reproduce the top half of a line-art image included in our Word document. Business graphics showed a slight improvement. Although there was horizontal banding in solid blocks of colour, this was very faint and not too serious

from a printer in this category. It just about coped with the reverse hairline test for accuracy in both standard and presentation modes, taking 4 minutes 14 seconds and 14 minutes 4 seconds per page, respectively.

PCW Details

Price £104.58 (£89 ex VAT)

Contact Olivetti Lexicon 01908 220111
www.olivettilexicon.com

Good Points Very small.

Bad Points Low resolution of 600x300dpi.

Conclusion Disappointing print quality.

★★★★★

SMALL OFFICE PRINTERS

Canon BJC-4300

Like the BJC-4650 in our A3 group (p189) the simple substitution of the two-cartridge printhead will turn the BJC-4300 into a scanner. Exclusive to Canon is also the option of adding a fluorescent cartridge. Large areas of continuous colour were not solid but speckled with white on both bubblejet and photocopy paper. Minor stepping was visible on fading fills progressing from white to 100% colour density in our business graphics, and there was difficulty reproducing a white hairline through an area of black. At high quality on photo paper our A4 image reproduced well with smooth tonal transitions and crisp edges to individual colours. Skin tones were handled well, and sandy, shallow waters were fairly accurately reproduced. Even on photocopy paper the



high-quality text output was excellent. Although slightly on the light side our larger characters were of uniform colour and had clean edges with no feathering. Text as small as 4pt was easily legible. There was no noticeable drop in quality when reducing the driver's setting to

Standard although it did reduce the print time from over 16 minutes to just 2 minutes 11 seconds, but the Draft setting is certainly not suitable for final output.

PCW Details

Price £151.58 (£129 ex VAT)
Contact Canon 0121 680 8062
www.canon.co.uk
Good Points Fluorescent cartridge option. Photo handling.
Bad Points Stepping on faded fills.
Conclusion A good contender.
 ★★★★★

Epson Stylus Color 850

Slight moiré was evident in our 50% grey test pattern ink block at the highest-quality setting, and this two-cartridge printer also failed to print the reverse hairline through solid black. However, on Epson's own inkjet paper colours were vibrant, solid and of uniform density. On photocopy paper at normal quality the colours were less vibrant, although the reverse hairline was fine and all stepping on our fades was lost. Superfine-quality text on photocopy paper was dark and smooth with clean-cut edges, and 4pt text was well defined. Economy print would be suitable only for personal use, but we would have no hesitation



in using the Normal setting for business. The 850 tore through our A4 colour photo in just 5 minutes 46 seconds at Superfine (1440dpi) quality and on photo paper looked good. Very fine although barely noticeable banding was evident and showed up most clearly on skin tones and clouds. The complex variation of green tones in a close-up mown lawn were handled well to produce a realistic,

pleasing result. Composite black areas were dense and unspckled, and reflected highlights, such as light catching fish-scales, gave depth to our images.

PCW Details

Price £375 (£319 ex VAT)
Contact Epson 01442 261144
www.epson.co.uk
Good Points Vibrant colours. Photo reproduction.
Bad Points Slow text output at high quality.
Conclusion Great for graphical applications.
 ★★★★★

Hewlett-Packard DeskJet 890C

This "conversation quiet" two-cartridge printer works fast, producing five pages of text and line art at Best quality in a lightning-fast 2 minutes 11 seconds. On photocopy paper there was no evidence of feathering and the black retained uniform tone throughout. Reducing the quality setting to Normal induced no significant decrease in output quality but did reduce the output time by a mere 10 seconds over a 5-page run. Econofast, HP's draft mode, took the print time down to 49 seconds while retaining acceptable output quality. Business graphics output on both inkjet and photocopy paper was excellent although at Best quality the solid cyan block showed slight irregular horizontal banding. Stepping on the graduated fill was minimal and the clear hairline drawn through an area of solid black was produced without fault.



Red, green and blue reproduction was the best we saw in this test. The A4 photo demonstrated slight horizontal banding on both inkjet and photo paper although the colours were bright, vibrant

and realistic. It competently handled a wide variety of colour tones, and made accurate representations of highlights and shade.

Personal Computer World
Editor's Choice

PCW Details

Price £317.25 (£270 ex VAT)
Contact Hewlett-Packard 0990 474747
www.hp.com
Good Points Quiet. Fast. Good business graphics.
Bad Points Slight banding. Performance on photo-quality paper not great.
Conclusion Our pick of the bunch.
 ★★★★★

PHOTO

Epson Stylus Photo 700

Cashing in on the success of the Photo Stylus, Epson has endowed the 700 with enhanced text handling. Using the six-colour cartridge and Epson's own papers we achieved a glossy, vibrant result with realistic skin tones, clear differentiation between reflected light, highlights and shadows, and smooth transitions between light and dark tones. Composite black was solid and deep and did not bleed. Only very slight banding was evident, and only in certain areas. Printing business graphics on inkjet paper at the Superfine (1440dpi) setting gave us bright, vivid colours although stepping was evident on cyan, magenta and black fades. The inverse hairline was lost and the 50% black block veered towards a light brown. Pantone colours were smooth and uniform.



Standard quality produced severe banding, even after cleaning the printhead, but the reverse hairline returned and the 50% black blocks returned to grey. The 700 took

20 minutes 13 seconds to complete our 5-page Word document at its highest-quality setting, and characters were dense and dark.



PCW Details

Price £273 (£232 ex VAT)
Contact Epson 01442 261144
www.epson.co.uk
Good Points Photo output. Business graphics.
Bad Points Slight ink bleed. Very slow text output.
Conclusion The photo printer of choice.
 ★★★★★

Hewlett-Packard DeskJet 720C

The 720C doubles as a photo and a home-office printer. In high-quality EconoFast mode five copies of our one-page Word letter arrived in under a minute. Installation involved an automatic checking of bi-directional data transfer, which is put to good use here: opening the lid during printing initiates an on-screen dialog box giving the opportunity to cancel printing — much easier than having to click in your system tray and delete the document manually. Using a standard colour cartridge the patented PhotoRET technology (smaller dots) employed by this printer produced excellent photographic results on premium inkjet paper. They were less impressive on photo paper, showing horizontal banding. This isn't altogether bad, as inkjet paper is cheaper than photo paper anyway, but it does mean



that the glossy finish is lost. Our five primary test colours of red, green, yellow, blue and composite black were well reproduced with no bleeding from one into the other. Solid blocks of colour were vibrant and graduated tones

demonstrated a smooth transition between 0% and 100% coverage with only slight visible stepping. In Normal and Best quality modes it even managed to run a clear hairline through a block of solid black ink.

PCW Details

Price £245.58 (£209 ex VAT)
Contact Hewlett-Packard 0990 474747
www.hp.com
Good Points Small. Fast. Great value.
Bad Points Poor results on photo paper.
Conclusion A great workhorse.
 ★★★★★

Lexmark 5700

This home-office and photo printer has the highest resolution (1200x1200dpi) of any of the units in this test. Using Lexmark's own photo paper and the optional photo cartridge, the 5700 reproduced our A4 image with exceptional quality. Skin tones were realistic, and red, green, yellow, blue and composite black were handled well. The image arrived in the output tray after only 10 minutes and 13 seconds. Although business-graphics quality was disappointing on photocopy paper with black blocks being uneven and severe banding on all coloured areas, it was greatly improved after switching to inkjet paper at high quality. Fades were smooth with minimal stepping, but while 100% CMY and RGB blocks were vibrant and



well reproduced, the 50% black test gave chocolate brown, not grey. On ordinary office paper, high-quality text was second to none: dark and even, with no discernable feathering on the edges. Five pages at this quality arrived in 5 minutes 59

seconds. Quality was similarly impressive at the Normal setting yet the print time reduced to under 2 minutes. Slight feathering became evident as a result of the change, though.

PCW Details

Price £229 (£189 ex VAT)
Contact Lexmark International 01628 481500
www.lexmark.co.uk
Good Points Price. Photo output. Small margins.
Bad Points "Brown" greys. Banding in business graphics.
Conclusion Beaten only by the Epson.
 ★★★★★

A3 PRINTERS

Canon BJC-4650

With a maximum resolution of 720dpi this A3 printer held just one printhead with independently replaceable CMY and black cartridges. Removing the head allowed us to swap it for an optical head that allowed the unit to double as a 360dpi scanner. It delivered a full-bleed A3 photo in just 19 minutes 34 seconds, with only a 14mm bottom margin and between 3mm and 4mm on the remaining three sides. Using photographic paper it produced vibrant tones with sharp definition between colours. It also coped well with business graphics, producing smooth graduated tones and managing to leave a thin hairline of white paper through a solid black area. On Canon's own bubblejet paper, blocks of



colour were characterised by undesirable speckling where the media showed through, and 12pt characters showed slight feathering. Using the same test pattern on photocopy paper

revealed evidence of marginal horizontal banding. High-quality text output on photocopy paper was very good, with five pages arriving in a little over 17 minutes.

PCW Details

Price £327.83 (£279 ex VAT)

Contact Canon 0121 680 8062
www.canon.co.uk

Good Points Scanner cartridge option. Good photo production. Small footprint.

Bad Points Speckling. Horizontal banding.

Conclusion Great for the home user.

★★★★★

Epson Stylus Photo EX

This A3 printer is aimed at the professional and enthusiast photography markets. Photo quality was excellent, with an A3 image taking 17 minutes 22 seconds to complete. On photo paper, areas of blue and green detail were very well produced. Skin tones were realistic, banding was minimal. Business graphics were sharp, and colours pure and brilliant. The block of 100% red was a satisfyingly rich tone, and not too orange. The EX failed to print the reverse hairline at its highest-quality setting and the 50% black text produced a slightly reddish grey. As this printer is not intended for text output, text handling was understandably poor. At the



Standard setting there was a noticeable drop in quality, with severe banding. Using photocopy paper, Superfine resolution produced dark, unfeathered results. Slight feathering was evident at Normal quality, while Economy mode was feint and of 24-pin dot-matrix quality. During testing it was necessary to clean the heads

of this printer several times. As a result, the on-screen ink reserve indicator showed that we had used almost half of our colour cartridge before printing the final page, making these tests quite costly.

PCW Details

Price £455 (£387 ex VAT)

Contact Epson 01442 261144
www.epson.co.uk

Good Points Bundled software. Skin tones.

Bad Points Slow on text. Expansive ink wastage.

Conclusion A solid submission from Epson.

★★★★★

Hewlett-Packard DeskJet 1120C

The 1120C printed a full-page A3 photo in 16 minutes 39 seconds, the same as it took for the A4. The quality of this image was far better, although less vibrant, on inkjet paper than on HP's own photo paper. Business graphics were second to none: on premium inkjet paper and set to High quality the colours were vibrant and pure with good, solid blacks. The inverse hairline running through a solid area was the clearest we have seen. The 50% composite and process black tones were identical although slightly pinkish, the Pantone blocks were even and clear. Although the black areas were of variable



density on photocopy paper, it produced a clear inverse hairline, smooth fading, accurate colours and good Pantone samples in just over 2 minutes at Standard quality. Econofast output was excellent and could be used for final copies, enabling users to produce five presentable pages in under a minute. High-quality text on photocopy paper was dark with exceptional 4pt text and uniform black

density across larger characters. Feathering was minimal.

Personal Computer World
Highly Commended

PCW Details

Price £446.50 (£380 ex VAT)

Contact Hewlett-Packard 0990 474747
www.hp.com

Good Points Fast A3 photo production. Good business graphics.

Bad Points Crooked A4 photo printing.

Conclusion A3 printing for the professional user.

★★★★★

Print samples: photos

Canon BJC-250



Lexmark 1000



Olivetti JP190



Canon BJC-4300



Epson Stylus Color 850



HP DeskJet 890c



Epson Photo Stylus 700



HP DeskJet 720c



Lexmark 5700



Canon BJC-4650



Epson Photo EX



HP DeskJet 1120c



Canon BJC-250



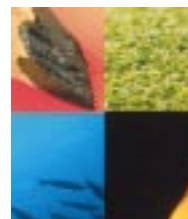
Lexmark 1000



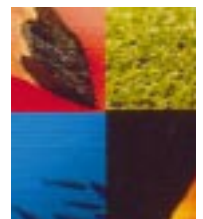
Olivetti JP190



Canon BJC-4300



Epson Stylus
Color 850



HP DeskJet 890c



Epson Photo
Stylus 700



HP DeskJet 720c



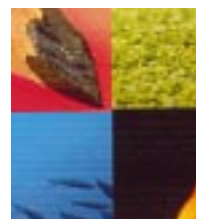
Lexmark 5700



Canon BJC-4650

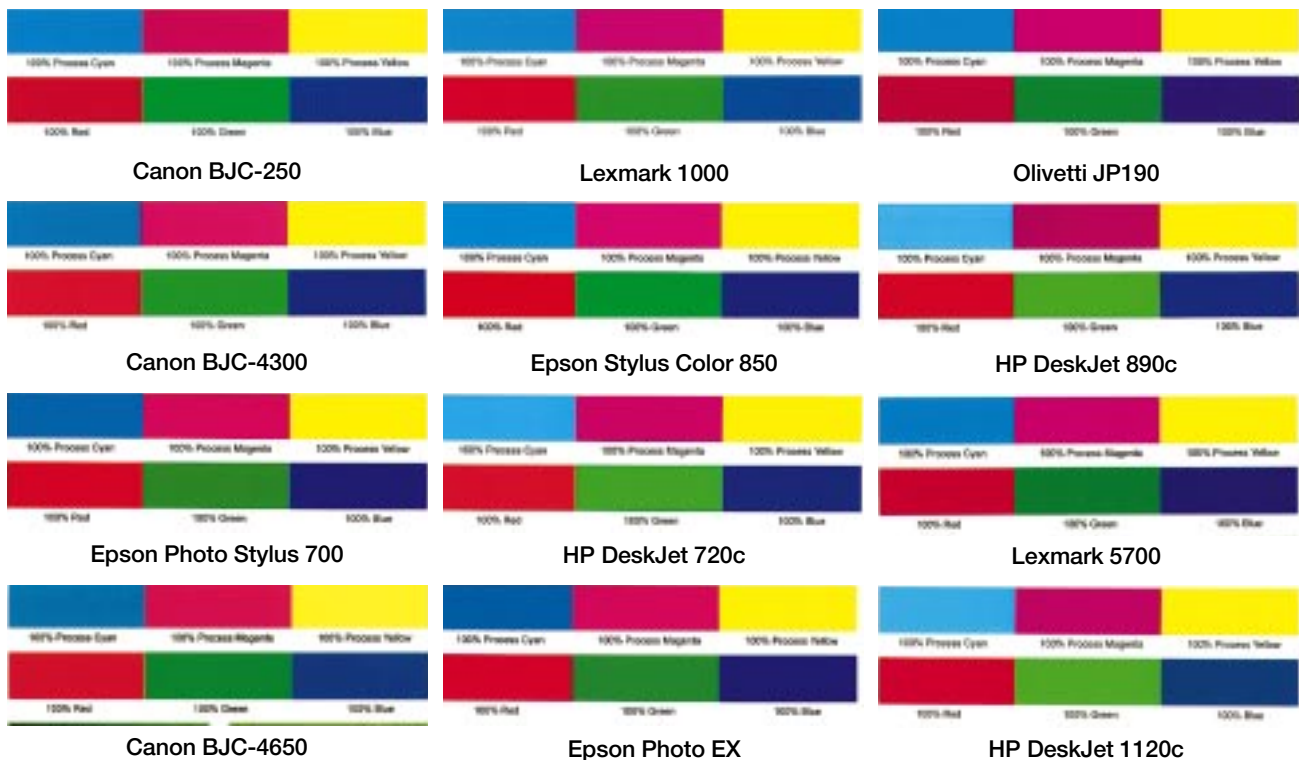


Epson Photo EX



HP DeskJet
1120c

Print samples: business graphics

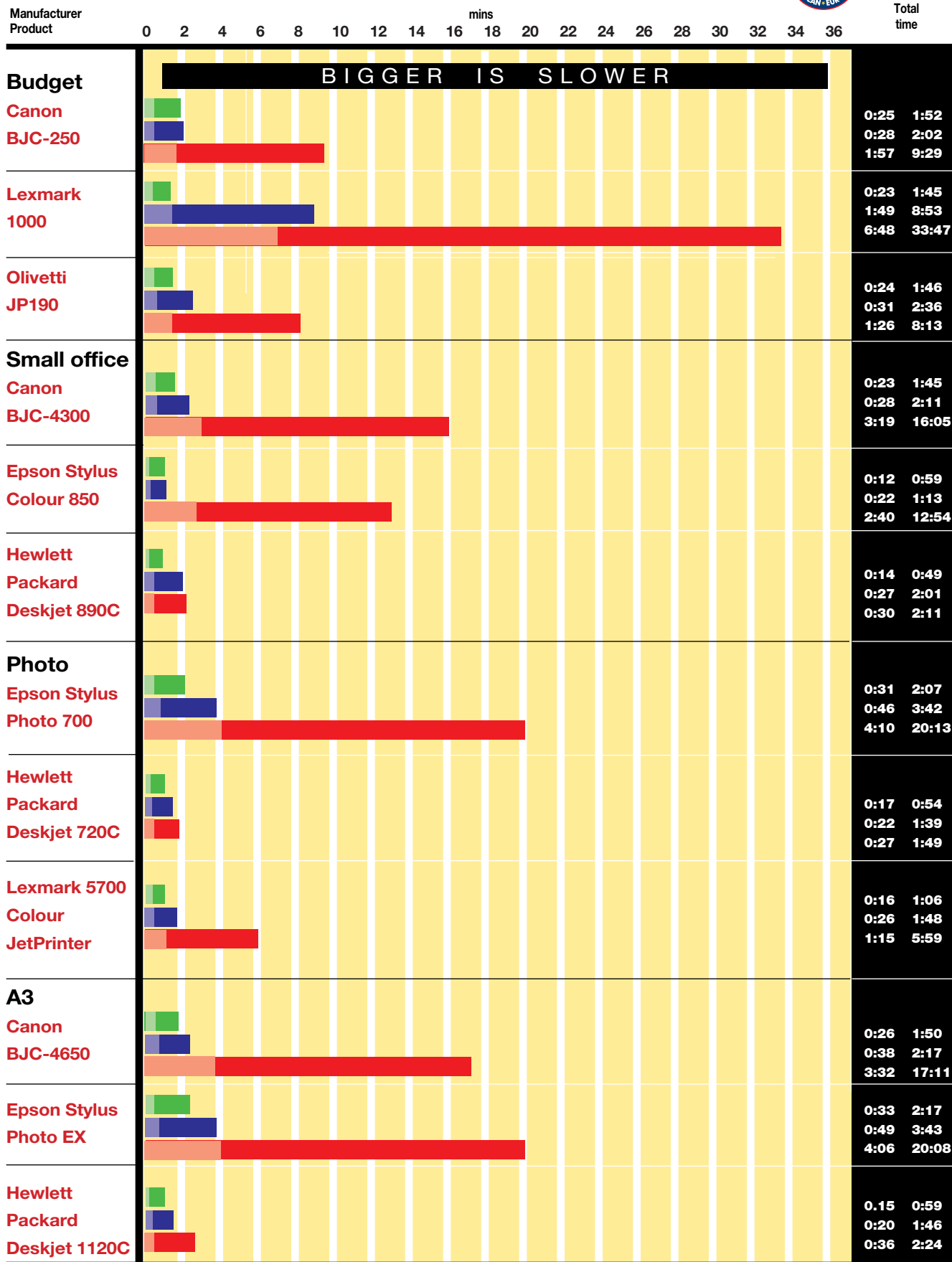


Print samples: text

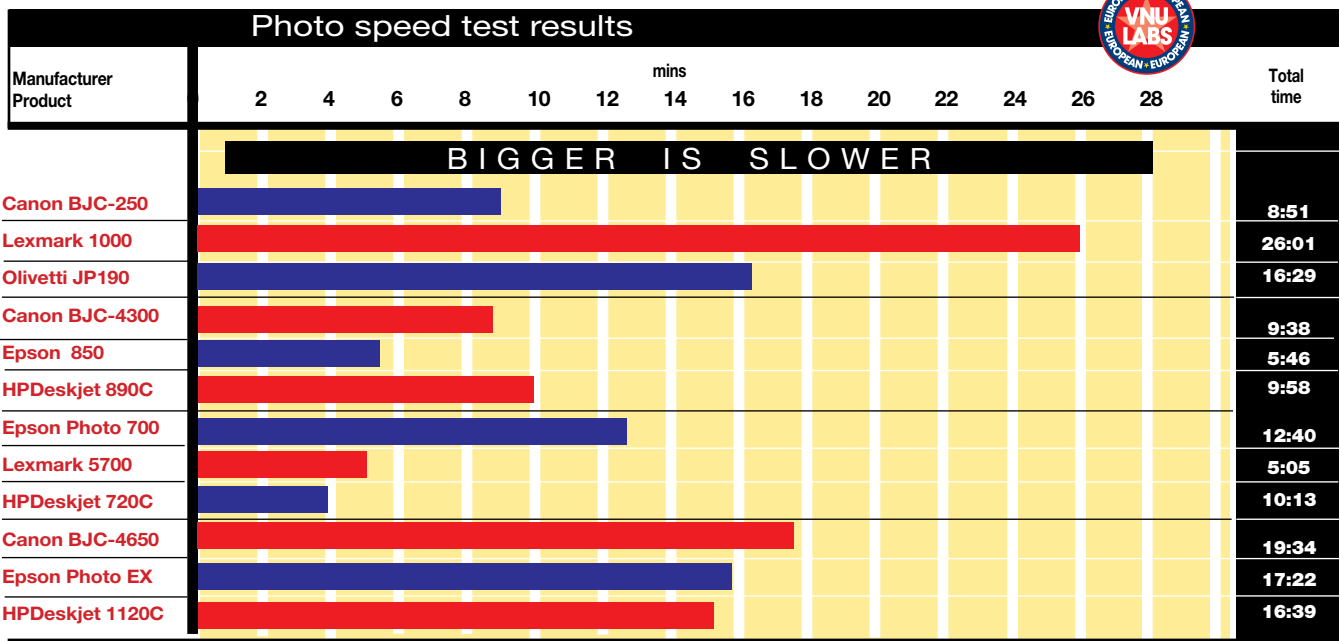
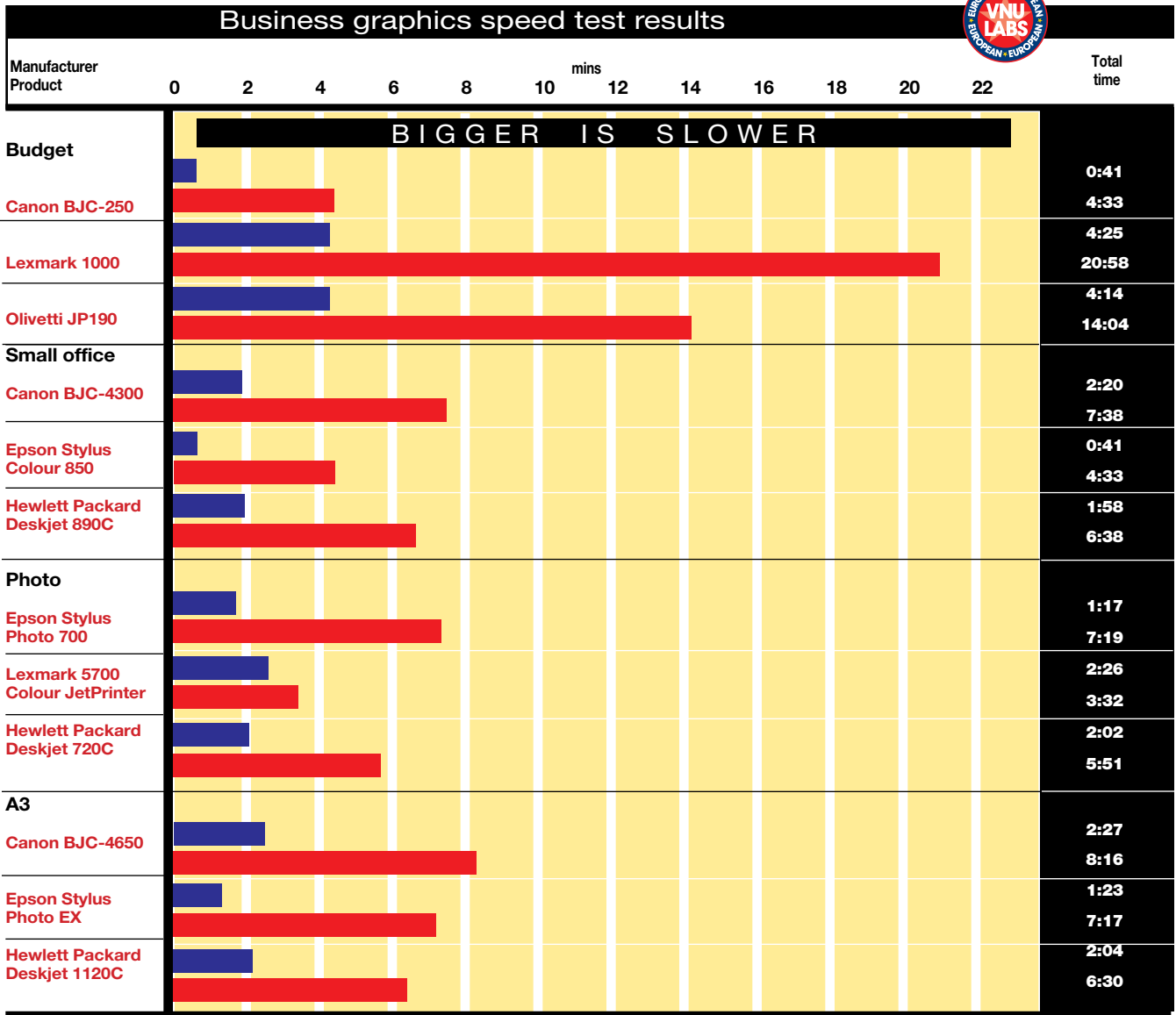
Canon BJC-250	The printers were tested for photo reproduction, business graphics and text. Photos were
Lexmark 1000	selected from the PhotoDisc collection to represent red, blue, green, yellow, black and skin
Olivetti JP190	tones to ensure that these twelve units had a comprehensive workout. They were examined
Canon BJC-4300	for accurate colour matching, purity, smooth transitions between shades and lack of bleed.
Epson Stylus Color 850	Our business graphic test pattern was generated using Corel Draw and as well as printing
HP DeskJet 890c	the solid colour blocks shown above also tested shading, gradation, Pantone colour
Epson Photo Stylus 700	reproduction, composite black and fine detail by running a white hairline through a block of
HP DeskJet 720c	solid black. Only really accurate printers will succeed in reproducing this hairline. The final
Lexmark 5700	text test consisted of sending a standard document containing several different font sizes
Canon BJC-4650	and a line art signature to each printer five times. In all cases the results were timed,
Epson Photo EX	measuring both the spooling time and the actual time taken to deliver the output, on both
HP DeskJet 1120c	the manufacturers' own brand paper and ordinary photocopy paper to measure quality.



Text speed test results



Key: ■ 1st page output standard quality ■ 5th page output draft quality ■ 1st page output draft quality ■ 5th page output standard quality ■ 1st page output high quality ■ 5th page output high quality p196 >



High-quality colour printing

Pop down to your local newsagent. Flick through a few magazines, preferably those on the lower shelves, and compare the same ads you find in them. Chances are, although the mags will have been printed at different printers, the ads will look remarkably similar, if not identical. Much of this predictability is down to proofing tools that best simulate the end result.

In the office this boils down to two pieces of kit: displays and colour printers. Not only do the printers and displays have to "agree" with one another, they also have to coincide with the final output generated at the printers. (For some clues on how to do this, see our Hands On Workshop, page 214). If you produce output that is destined for a print shop then you may require only a reality check for a file that's on its way to a printing press. It may be enough to print "comps", design compositions that show the layout and let you judge design without worrying about particulars such as precise colours. Alternatively, you may need pukka proofs, with colours and layout that look as close as possible to the final product.

Colour printing technologies

Colour printers use one of four printing technologies:

- Laser
- Liquid inkjet
- Solid ink
- Dye sublimation

Colour laser printers offer good performance for colour printing and excellent performance for monochrome printing. They also have a fairly high duty cycle, making them ideal network printers.

On the downside, colour laser printers have more user-replaceable items such as four toner cartridges, a developing drum and a toner waste bottle. Compare this with inkjet printers, which usually have only four small inkjet cartridges. Also, colour laser printers have a higher initial cost than do solid ink or inkjet printers.

Colour lasers continue to improve, and the current generation offers better-looking output overall than the previous crop. This is down to a new generation of print engines which do a better job of laying down colour evenly and offer improved colour registration. You may still come across artefacts like banding in gradient fills, but any flaws you do see won't be quite so noticeable. Early colour lasers couldn't really manage photo-realistic output; the latest ones can.



Liquid inkjet colour printers are cheap to buy but the print quality they offer, while very much improved, simply isn't on a par with other printing technologies. They are slow, and have relatively high running costs. Things are improving, however: Epson's Color Proofer 5000 gives output comparable to solid-ink printers.

Solid-ink printers, such as the Tektronix Phaser 350/360/380, offer bright colours and can print on the widest types of media. However, the printouts often have a waxy texture that may be unappealing to some users. Although solid-ink printers typically have lower resolution, their output is good. Unfortunately, lower resolution may be inadequate for resolving very fine characters, curves or edges on objects. Dithering can be noticeable, too.

Dye-sublimation printers (also known as thermal printers) convert solid material to gas, which is then transferred to paper. They can produce true continuous-tone images and true photographic quality. They offer the best output of all the printing technologies, but that quality comes at a price. Dye-sublimation printers are very expensive (several thousand pounds), to buy and run, and as highly specialised devices they are not commonly used in typical office environments. They are most often found in graphic arts or science where pre-press output is required.

Dithering

One problem with most colour printers is visible dithering. Most images need shades of colours or grey, but most printers don't produce shades. They are bi-level printers: at any point, either a given colour pixel appears or it doesn't. This allows a maximum of eight possible colours for any given dot. This limitation can be overcome by dithering, which combines dots on the page in a way that fools the eye into seeing shades and colours that aren't really there.

An image is broken down into dithering cells of, say, 5x5 dots. You can increasingly place dots in each cell to generate 26 levels of grey, from 0 (no dots) to 25. For colour there can be 26 possible values each for cyan, yellow and magenta, giving you a total of 17,576 colours.

The downside of dithering is that it reduces apparent resolution: with 5-pixel cells, a 300dpi printer's resolution drops to 60dpi. Also, a block of cells with the same colour can show visible patterns from the dithering, like the squares on a tiled floor. Variations in implementation can make the dithering patterns less visible, but they are always there.

Dithering can be avoided with the use of thermal dye printing which can print each primary colour, cyan, yellow and magenta, at any of 256 values, or levels. By printing each of the three colours on top of each other, you can print any one dot in any of about 16.7m colours. This continuous-tone printing is fine enough that the human eye

can't see the steps from one colour to the next without a magnifying glass.

Some lasers offer a halfway house, called contone printing. Contone printers, unlike bi-level printers, can print more than



one shade of each colour per dot, by varying the dot size, but not 256 shades. They still need dithering to produce 16.7m colours, though they don't need as many dots per cell to simulate a given number of colours.

Another solution, used by so-called photo-quality inkjets, is to add extra colours to the process. With two extra colours, typically a light cyan and a light magenta, it's possible to better represent light areas such as skin tones and skies.

Proofing-printer essentials

● Page size

While A4 is the standard page size for ordinary printers, colour printers are special. For example, full bleed, where the image is printed right up to the edge of the page, isn't possible on most printers because they all have a "non-printable" area on the page of perhaps a few millimetres. So, to do full-bleed A4 requires a page slightly larger than A4.

The extra area also allows for crop and registration marks. A3 capability is also important as it allows the production of double-page spreads — that is, A4 pages side by side. Couple this with a duplexing capability and you have a colour printer capable of handling short-run print jobs, the sort that normally would have to be farmed out to a print shop.

● Colour management

Most printers will comply with one or more colour management systems (CMS), which guarantees colour accuracy from start to finish. The most common CMS is Pantone but there are others. Most colour printers will offer some sort of CMS but it is rarely found in inkjet printers.

● PostScript

It may be a WinTel world out there but in the world of publishing and printing, the Apple Mac still reigns supreme. Macintosh printers only speak one page description language and so a crucial feature of our high-quality printer has to be PostScript Level 2 or 3.

● Cost

This is probably the least important area because traditionally, high-quality colour output has always been expensive. For example, most magazines run out a cromalin, a film proof, of their most important page, the front cover, and this can cost £100 just for that one page.

Lexmark Optra Color 1200

PCW was given first look at Lexmark's latest colour laser, the Optra Color 1200 (1). It handles A3 full-bleed output, and it's blazingly fast — it can spew out A4 full-colour pages every 5 seconds. It can do this because of its "in-line" print engine developed in conjunction with Casio: a page makes a single pass under four print "heads" rather than pass four times over a single printhead on a toner "carousel". The print speed for A3 is exactly half this, i.e. 6ppm.

Just under £5,000 buys you a true 600dpi colour laser — sorry, LED — printer, with 32Mb of RAM, 4Mb of flash RAM, PCL5c, PCL6 and PostScript Level 2. A network version, with a network card, second 250-sheet paper cassette and double the RAM costs £800 more. Toner life is good, with each cartridge good for 6,500 pages at 5% coverage.

I looked at a prototype of the Optra Color 1200 at Lexmark's UK HQ at Marlow. The printer had an early cut of the drivers and these did require further work, delivering dull output when any fancy options were chosen. Its ability to deliver solid colours was good, as was its performance on graduated fills where only a hint of banding was detectable. Overall, output looked a little on the "warm" side, particularly on flesh tones.

Price: £4,999

Contact: Lexmark International
01628 481500 www.lexmark.com

Good Points: Big format. Fast. Relatively cheap.

Bad Points: Drivers require tuning.

Conclusion: The Optra Color 1200 shows great promise. The jury is still out pending delivery of the final drivers but on the VFM and speed front, Lexmark has stolen a march on its rivals.

★★★★☆

QMS magicolor 2 EX

QMS seems to have come from nowhere to the top of the pile with its award-winning magicolor 2 colour laser printers. Based on a colour laser engine from Hitachi, QMS's magicolor 2 models are available in two flavours: the £2,795 2CX is designed for general business 600dpi output, while the £3,795 QMS magicolor 2 EX (2) provides up to 2400x600dpi resolution for proofing and pre-press applications. Both are network-ready and offer colour print speeds of between 4 to 8ppm, 16ppm mono. The 2 EX is also available as a GDI version for less than £1,800.

All magicolor lasers come with the same



network management (CrownVision) and configuration utilities. The Windows 95 client is particularly impressive — you can see at a glance, for example, how much toner is left in all four cartridges. You can even calculate the individual cost of each printed page, based on toner usage, useful for back-charging departments. There's also support watermarks, thumbnail printing and automatic colour matching.

Output quality for typical business graphics and photographs at 600dpi was good. Colours are a little pale compared to the Phaser 560 but were still very good nonetheless. The 2400x600dpi output of the 2 EX impressively dealt with most of the flaws found in the 600dpi output, though some banding was evident on gradient fills. Pages have a pleasant "silk" finish to them.

Price: £3,795

Contact: QMS (UK) 01784 442255

Good Points: Great-looking output. Very high resolution. Low running costs. Good value.

Bad Points: Hard to fault.

Conclusion: The 2 EX with its 2400x600dpi output is capable of giving excellent-quality results. It's not as fast as the Phaser 560, which is technically a better printer, but the entry-level 2 CX version is an attractive alternative.

★★★★☆

Tektronix Phaser 360

The Phaser 360 (3) is Tektronix' most recent addition to its range of solid inkjet printers. A refinement of the Phaser 350, the 360 offers better-quality output and a range of minor tweaks for a modest price hike of £200. Resolution has been increased from the standard 600x300dpi to 800x450 in Enhanced mode thanks to a new print controller driven by a 100MHz RISC processor. This is also the first printer we've seen that supports the latest release of PostScript, version 3.

New to this model is the inclusion of a 10Mbps 10Base-T network card as standard; a 100Mbps alternative is available as an optional extra. The Phaser 360 supports numerous colour standards including Pantone and Apple ColorSync. It comes with 24Mb of RAM as standard, expandable to 48Mb. Maximum print speed is 6ppm in full colour, and printing on transparencies is supported.

The new Phaser delivers well-saturated colour output — brilliant, solid colours with little evidence of banding. The new Enhanced mode produced particularly fine-looking output on colour photo images but even on business graphics its ability to produce fine gradations was immediately noticeable.

It's not bad on the speed front either: in standard mode it took 48 seconds to print a full-colour A4 image on plain paper and another 18 seconds to produce the next page, or 3ppm. In Fast Colour mode the time to first page dropped to 40 seconds and subsequent pages were delivered every 12 seconds, or 5ppm. Although these are slightly below the claimed speeds, they nonetheless compare favourably with colour laser print speeds.

Price: £3,295

Contact: Tektronix UK 01628 403600

www.tek.com/color_printers/

Good Points: Vibrant output. Networking as standard. Simple to use.

Bad Points: Slow to warm up.

Conclusion: The Phaser 360 is a capable colour printer thanks to the new 800x450dpi Enhanced mode; it is capable of producing quite literally brilliant-looking output. It's faster than most colour laser printers, price-competitive with them and produces better-looking results.

★★★★☆



Tektronix Phaser 560

For some time now, the Phaser 560 (4) has been the yardstick by which other colour laser printers are measured. And it's been hard to better for a very simple reason: it's a very good colour laser printer.

Setting up isn't quite as easy as the 360, but it's far easier than with most laser printers, requiring you to plug in the cables, insert the four toner cartridges and install the software. And user interventions will be low, too: the claimed 12,000 pages per cartridge for the black toner (10,000 pages for colour) mean you won't have to change cartridges too often.

The Phaser 560 delivers great-looking output quality. Graphics had sharp edges with no registration problems, and solidly filled-in areas of well-saturated colour. Thin lines were well formed, and smooth gradient fills were possible with just a hint of banding on our tests. The Phaser 560 comes closest to delivering photo-realistic looking output — closer indeed than any colour laser printer has come thus far. Photo images (printed in the somewhat slow 1200dpi mode) are nicely balanced, with good detail, barely perceptible dithering and accurate rendition of skin tones, which is difficult to get right. Text is as sharp and crisply defined as you would expect from any monochrome laser printer.

The Phaser 560 was one of the best performers on the tests we ran at 600x600dpi — 14ppm monochrome and 5ppm colour. It did slow down a bit, however, on our 1200x1,200dpi tests.

Price: £3,595

Contact: Tektronix UK 01628 403600

www.tek.com/color_printers/



Good Points: Currently the ultimate colour laser.

Bad Points: Nothing worth mentioning.

Conclusion: The Phaser 560 provides top-notch colour output for both business and graphics, capable of satisfying all but the most discriminating users. Its 1200dpi mode is particularly impressive, if a little slow.

★★★★☆

Table of Features						
						
Manufacturer	Lexmark International	Canon	Olivetti Lexicon	Hewlett-Packard	Epson	Canon
Model	1000 Color Jetprinter	BJC-250	JP190	DeskJet 890C	Stylus Color 850	BJC-4300
Price ex VAT	£81.70	£99.00	£89.00	£270.00	£319.00	£129.00
Price inc VAT	£99.00	£116.33	£104.58	£317.25	£375.00	£151.58
Telephone	01628 481500	0121 680 8062	01908 220111	0990 474747	01442 261144	0121 680 8062
Web site	www.lexmark.co.uk	www.canon.co.uk	www.olivettilexikon.com	www.hp.com	www.epson.co.uk	www.canon.co.uk
Supported resolutions	600 x 600	360x360 / 720x360	600x300	up to 600dpi	360x360 - 1440x720	720 x 360
Cartridges held	1	1	1	2	2	1
Cartridge types (prices ex VAT)	Black £19 Colour £22.14	Colour £21.27 Black £17.01 Photo £21.27 Fluorescent	Economy Black £15.33 Standard Black £19.16 Waterproof Black £21.72 Refill Printhead £31.00 2 ink refills £10.42 Tri-colour head £29.45	Black £21.80 Tri-colour £26.60	Black£17.69 Colour £18.10	Colour Tank 17.77 Black Tank £4.60 Black £22.13 Photo £23.82 Fluorescent £25.52
Cartridge life	Black 600 pages Colour 200 pages	Colour 200 pages Black 500 pages	Economy 600 sheets Standard 1000 sheets	Black 830 pages Colour 460 pages	Black: 900 pages Colour: 300 pages	Black 900 pages Photo 50 pages
Inkjet paper (ex VAT)	100 sheets £5.09	200 sheets £11.06	200 sheets £17.66	Bright white, 500 sheets £8.80	360dpi, 100 sheets £6.40	200 sheets £11.06
Glossy paper (ex VAT)	20 sheets photo £8.89 200 sheets coated £20.06	20 sheets £10.20	20 sheets photo £14.70	15 sheets photo £6.50	20 sheets photo £6.20	20 sheets £10.20
Paper out tray capacity	N/A	100 sheets	40 sheets	50 sheets	100 sheets	100
Paper in tray capacity	30 sheets	100 sheets	40 sheets	N/A	100 sheets	100
Dimensions (mm) (hwd)	170x360x175	171x361x215	165x376x200	396x444x226	177x475x274	203x383x323

Table of Features						
						
Manufacturer	Hewlett-Packard	Epson	Canon	Hewlett-Packard	Lexmark International	Epson
Model	DeskJet 1120C	Stylus Photo EX	BJC-4650	DeskJet 720C	5700 Color Jetprinter	Stylus Photo 700
Price ex VAT	£380.00	£387.00	£279.00	£209.00	£189.00	£232.00
Price inc VAT	£446.50	£455.00	£327.83	£245.58	£229.00	£273.00
Telephone	0990 474747	01442 261144	0121 680 8062	0990 47 47 47	01628 481500	01442 261144
Web site	www.hp.com	www.epson.co.uk	www.canon.co.uk	www.hp.com	www.lexmark.co.uk	www.epson.co.uk
Supported resolutions	600dpi/PhotoRETII	1440 x 720, 720 x 720, 360 x 360	720 x 360 / 360 x 360	600dpi	1200dpi x 1200dpi	360 x 360 / 1440 x 720
Cartridges held	2	2	1	2	2	2
Cartridge types (prices ex VAT)	Black £21.80 Tri-colour £26.60	Black £15 Colour £11.69	Colour £34.04 Colour Tank 17.77 Black Tank £4.60 Black £22.13 Photo £23.82 Flourescent £25.52	Black £21.80 Tri-colour £26.60	Black £19 Colour £23.57 Photo £27.14	Black £15 Colour £11.69
Cartridge life	Black 830 pages Colour 460 pages	Black 540 pages Colour 220 pages	Black 900 pages Photo 50 pages	Black 830 pages Colour 460 pages	Black 600 pages Colour 200 pages	Black 540 pages Colour 220 pages
Inkjet paper (ex VAT)	500 sheets, £8.30 100 sheets £6.40	360dpi	200 sheets £11.06	200 sheets £5.20	100 sheets £5.09 100 sheets £6.40	360dpi
Glossy paper (ex VAT)	15 sheets glossy £6.10 15 sheets photo £6.50	20 sheets photo £6.20	20 sheets £10.20	15 sheets photo £6.50	20 sheets photo £8.89 200 sheets coated £20.06	20 sheets photo £6.20
Paper out tray capacity	50 sheets	100 sheets	100 / A4, 50 / A3	50 sheets	100 sheets	100 sheets
Paper in tray capacity	N/A	100 sheets	100 / A4, 50 / A3	N/A	150 sheets	100 sheets
Dimensions (mm) (hwd)	233x577x380	172x546x275	216x447x253	355x446x185	180x425x203	165x429x282

Editor's Choice



While a laser printer once seemed the only sensible choice for a small business, inkjets are catching up in terms of quality. Similarly, the three photo printers highlighted here show that you can now have a virtual darkroom right on your desktop. If you look at our features table you will also see that inkjets are good for producing more than just reports and letters, and with the development of specialised media they can also be used to design everything from T-shirts to greetings cards.

The three printers submitted in the **Budget** category each proved that you did not need to spend a lot of money to get great-looking results. Each held only one cartridge, which was not unexpected, and meant that we found ourselves switching between black and colour when appropriate. The **Canon BJC-250** particularly impressed us, making a decent stab at the photograph, textual output and our business graphics text, and so is the winner in this group.

The **Small Office** category was perhaps the most hotly contested, with all three submissions producing excellent results. Canon impressed us with the option of fluorescent ink in its BJC-4300, while our photo was almost as good as the original when reproduced on the Epson Stylus Color 850. Overall though, we raise our hats to **Hewlett-Packard** for the **DeskJet 890C**, which is came out top in this section. Eerily quiet, we would not have hesitated to send out even the Econofast output to clients, while in business graphics it excelled.

Digital photography is a growth area, with more and more cameras joining those already on the market. It is not surprising, therefore, that a similar number of **Photo printers** is lining up to join them. We very nearly awarded our pick-of-the-bunch to the Lexmark 5700 on the strength of its handling of our A4 photograph, but that was before we saw the output produced by the **Epson Stylus Photo 700**. Although the results obtained from

Lexmark's submission would have pleased even the most critical judge, the Photo 700 produced output that was glossy, well defined and realistic. In short, it was the very deserving winner in this category.

A3 printers, the final category in our test, are less common, being too large and unsuited to the average home user. In an office environment, though, they are ideal for the in-house production of posters or laying out facing pages of A4 bound literature. In this instance, one of the things we were interested in was speed: we were, after all, printing twice as much as we might on an A4 printer, and there is no question that where this is concerned the **Hewlett-Packard DeskJet 1120C** won hands down. It also produced outstanding business graphics and text, and so is the best from the A3 arena.

Selecting one overall winner, therefore, to receive our Editor's Choice award is a matter of selecting from the four winners of each category. While it is tempting to choose the DeskJet 1120C because it is the most versatile, handling all paper sizes up to A3, it is probably not best suited to use outside of office environments. Epson's Photo 700 would suit those who are looking for the best photo reproduction available within its price range, but those willing to make a small sacrifice in this area would probably find themselves better served by the **Hewlett-Packard DeskJet 890C** which is duly named our **Editor's Choice**. The three category winners — the **Canon BJC-250**, the **Epson Stylus Photo 700** and the **HP DeskJet 1120C** — all come **Highly Commended**.



Top and below: the four prime printers, from HP, Canon, Epson. Above: the original photograph used in our colour tests





All the best

You probably already have your 'best' utility comfortably intalled on your PC. But you could always try one of the few favourites we've rounded up here.

A good utility is "one that you could not live without". But try asking 20 people what that utility would be, and you will probably get 20 different answers. Part of the problem stems from what you would define as a utility in the first place. When does a utility stop being a utility and become a fully-fledged application? In past years we have included such software as Paint Shop Pro and Netscape Navigator but they have definitely slipped over the edge into applications.

What qualifies as an indispensable utility also depends on how you like to manage your PC. Some people cannot live without

Norton Utilities, while others make do and mend with the utilities included in the operating system.

This year, to make matters easier, we have concentrated on the best utilities available in certain categories: diagnostics and system protection, web utilities, hard-disk partitioning and boot sector setup, hard-disk management, zip utilities, uninstallers, and everything you need when you are on the move with your notebook. We have also rounded up those utilities we use ourselves at PCW. In short there is something for everyone, whatever they need from their PC, in the pages that follow.

ILLUSTRATION BY Marc Arundale

Diagnosis and System Protection

We've all experienced the frustration of our systems freezing and crashing, or our PC playing up. So, to iron out those little niggles, catch potential problems before they strike, or to get the best performance from your PC, here are some utilities you could use.

Norton Utilities

This is a vast collection of tools to make working as smooth, fast and problem-free as possible. For example, Speed Start analyses your PC usage habits and rearranges the information on your hard drive to reduce startup times. Speed Disc is a fast and furious defragmenter. CrashGuard (not the latest version) intercepts crashes and allows you to save your work before closing. It even tells you how likely it is that you will be able to restore the application and so avoid the crash.

Live Update downloads new drivers, software updates and virus-scan files. Registry Tracker monitors changes made to the registry. WinDoctor scans for broken applications, lost DLLs and missing links, as well as finding invalid registry entries. This latter could be invaluable to those who install and remove a lot of software.

Many of these utilities can run in the background, informing you when they meet problems. All are brought together into the Utilities Integrator which organises them under appropriate headings and lets you activate or deactivate them as required.

First Aid

First Aid is ideal for novices and home users. It includes a Windows Guardian utility which runs automatically when you start Windows and sits in the system tray monitoring your PC and alerting you to problems. It can intercept crashes, buggy or conflicting applications, corrupted system settings and memory problems, and will alert you when your hard drive is getting full.

If you know there is a problem, Check Up will look at your entire system or examine specific devices and software settings, too, using a knowledge-base which it updates, along with other information via the net, using a special version of Cybermedia's Oil Change.

Emergency Care can be used to create emergency discs, run anti-virus software, backup and restore data, while BackTrack remembers earlier versions of system settings so you can remove installations that have upset configurations. Reference Desk offers a library of information like a glossary of computer terms and a tech support directory.

REALHELP

REALHELP is big, bold and fully-functioned, but Quarterdeck has done a good job of



Above The central organiser for all the Norton Utilities **Right First Aid 98** offers a fair range of utilities for those who don't want to delve too deeply under their PC's bonnet



Left Plentiful utilities are well organised in REALHELP **Below** Crash Guard can prevent crashes or provide a cure for a disaster



keeping everything under control with a clean user interface. It organises the various utilities under the headings: prevention, repair, diagnostics, inventory and support. A bonus is its ability to run a conflict detection utility continuously in the system tray, alerting you to hardware configuration problems, missing DLLs, application conflicts and the like.

It also has the ability to capture changes made to your setup each time you install software, hardware, or make alterations to configuration settings, so that these changes can be removed by clicking on a couple of buttons. A clever tool called Find-A-Fix organises a huge range of possible problems, including hardware, software and Windows 95 difficulties, in a branching tree. The text that provides the solutions is stored as HTML files, so you can easily browse through linked items.

The hardware diagnostics are broad

ranging and will check areas like PCMCIA devices, CD-ROM, modem, video, sound card and printer configurations. TuneUp automatically monitors a special web site for updated applications and drivers, prompting you if it finds things which might be helpful.

Norton Crash Guard Deluxe

Crash Guard automatically protects your PC against disasters which can lead to lost data.

On-board utilities include System Check which scans your PC for errors. It can be manually run

or set to run in the background where it will continually monitor and fix problems. Among its library of functions, System Check can check the integrity of your hard drive, run virus checks (you can download updated virus information from Norton's web site), watch the registry, and warn you when a disc defrag is needed.

Other utilities include Crash Guard itself which spots crashes before they happen and recovers data, and Anti-Freeze which anticipates individual program lock-outs and lets you save data before it is lost forever. These are crucial. If a crash is about to occur, the software can issue a warning so that you can save the files you are working on before trying to do something about the problem.

The CD includes instructional videos on everything from changing display settings to cleaning a CD-ROM. The ethos behind Crash Guard is that prevention is better than cure.

Sandra Vogel

PCW Details

First Aid 98

Price £49.35 (£42 ex VAT)

Contact Cybermedia 0800 973 631
www.cybermedia.com

Norton Crash Guard Deluxe

Price £57.58 (£49 ex VAT)

Contact Symantec 0171 616 5600
www.symantec.com

Norton Utilities

Price £104.58 (£89 ex VAT)

Contact Symantec 0171 616 5600
www.symantec.com

REALHELP

Price £38.78 (£33 ex VAT)

Contact Quarterdeck 01628 666322
www.quarterdeck.com

Hard Disk Management

■ Partitioning

There are plenty of reasons why you might want to divide a large hard drive into several small sectors, or partitions as they are known.

Perhaps you want to install several operating systems and want to fool each of them into thinking that you have more than one hard drive? Perhaps you suffer from the "wasted cluster" syndrome where any file, whatever its size, occupies a minimum of 32Kb. This is likely to be the case if you have a large hard drive and are running Windows 95 OSR2 and, if you store lots of small files, could result in considerable loss of space — Powerquest reckons up to 40 percent of used space. Maybe you just want to create separate storage areas for different kinds of software? — creating an area specifically for games, or for work brought home from the office, say.

Partition Magic is reasonably easy to use and is flexible, allowing you to change partition sizes as needed, so you don't have to make once-and-for-all decisions the first time you run it. It offers a range of useful additional utilities, including one which lets you move applications from one partition to another. It also offers a Boot Manager, from IBM, which lets you choose between operating systems when you switch on your computer.

Partition-It is Quarterdeck's direct rival for Partition Magic and it offers many similar functions. Unlike Partition Magic it allows you to do most of what you need within Windows, which for some users makes it easier to get to grips with, although it opens up the possibility of crashes if you try to use it with other applications running.

Partition-It includes a range of extras designed to make working with partitions easy. For example, it will automatically update your configuration files when drive letters change, after you have created new partitions.

Two further extras are worth noting. Move-It enables you to relocate an application to a new virtual drive, moving all the DLLs and changing the registry entries and shortcuts as necessary. Select-It is a boot manager for use with multiple operating systems and comes complete with its own printed manual which explains, in quite some detail, how to use it. The manual, like that for the main Partition-It application, is aimed at laymen rather than technical users.

■ Boot sector management

Once you have your hard disk partitioned, you will want some way of booting into the various operating systems you have decided to install.

System Commander Deluxe is designed



Left Partition Magic helps you divide a large, space-wasting hard drive into smaller, manageable, more frugal chunks

Middle Partition-It provides plenty of detailed information about the partitions, even before you start to divide a large hard drive into smaller segments



Below Drive Image creates a complete copy of your hard drive, just in case the very worst should happen

■ Backup and restore

Drive Image is not a standard hard-drive backup utility. Where others copy just the files and folders on your hard drive to a storage medium, this application can make a complete image of the hard drive, operating system and all.

The idea is that when it comes to restoring, say after a hard-drive crash, all you need to do is restore the image that has been created. This will provide you with all user data, including things like web browser bookmarks which are often forgotten when you make standard backups, as well as system and software settings that may have been changed and tweaked over time and which can often take a long time to reinstate. The net result is a backup utility that is faster and easier than a complete reinstall.

Drive Image will make its mirror to almost any medium you like — zip drive, second hard drive, Jaz drive. It will not write directly to CD-R nor CD-RW, however. Data compression allows you to store information in reduced space and there are special features for network managers, allowing them to clone multiple workstations.

Sandra Vogel



to enable the installation of multiple operating systems on a single PC. One of its strengths is that it allows you to run multiple operating systems in the same hard-drive partition.

So, those of us who need to run two or more operating systems can set up a single partition to contain them all. It can even modify existing hard disk partitions on-the-fly.

The process of installing new operating systems is guided by a Wizard which determines the best configuration for both new and existing operating systems and then guides you through the installation process.

Nevertheless, the job of installing and running more than one operating system can be rather complex and System Commander's manual does its best to point out some of the more common issues that might be met when installing the most widely-used operating systems.

PCW Details

Drive Image

Price £58.70 (£49.95 ex VAT)

Contact Pow 01202 716726

www.powerquest.com

Partition-It Extra Strength

Price £ 58.74 (£49.99 ex VAT)

Contact Quarterdeck 0645 123521

www.quarterdeck.com

Partition Magic

Price £58.70 (£49.95 ex VAT)

Contact Pow 01202 716726

www.powerquest.com

System Commander Deluxe

Price £49.99 (£42.54 ex VAT)

Contact MediaGold 0171 419 9861

www.v-com.com

Web Utilities

There was a time when the internet was nothing more than several thousand pages of text. Next came the worldwide web and the introduction of pictures, followed by sound and eventually live full-motion video. Each innovation spawned a new series of utilities to the point that today, although your browser may still be the primary launch pad for your online experience, relying on that piece of software alone would be akin to having a car without petrol.

Looks a bit Flash

It was not so long ago that animated GIFs seemed impressive. That, though, was before the era of Shockwave. In 1997 alone over 37 million Shockwave players were downloaded for viewing files generated by **MacroMedia's Flash**, Director or Authorware packages. Currently shipping version 3 of Flash, MacroMedia has made it easier than ever for site managers to use the technology on their pages.

Java support now means that visitors clicking on the inevitable "get plugin" button will have the viewer downloaded and automatically installed on their machine without ever needing to visit the MacroMedia site.

Not only does Flash enable designers to create complex animations with the minimum of resources (an 80-second 4in x 3in colour animation will typically consume only around 200Kb) but it also allows for the development of complex menu systems with rollover help dialog.

A good demonstration of its animation capabilities can be found at <http://shockwave.macromedia.com/members/toons/dilbert/>.

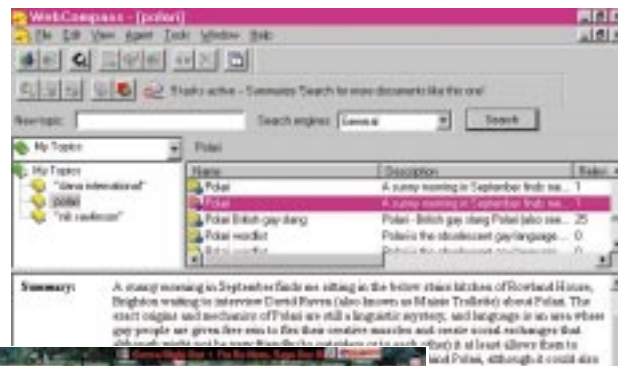
The Real thing

One step beyond animation is video, and more and more broadcasters are seeing the benefit of simulcasting their output on the net. Almost all of Radio 5 Live's broadcasts, with the exception of some live sporting events where copyright implications step in and spoil the fun, are transmitted worldwide using Progressive Networks' **Real Player**.

Likewise, BBC1's one, six and nine o'clock news bulletins are "netcast" live before being archived in their entirety for viewing on your PC. Currently at version 5, Real Player is available for free download (1.33Mb) from the Progressive Networks site and those wanting to produce their own output can grab themselves a copy of the encoding software for \$49.99.

The major benefit in listening to news and other archived material in this way is that you can "rewind" using the VCR-style controls of the player — something not possible on the radio or TV. Further, because the content is streamed it is no longer necessary to download the programme in its entirety before playing, which can save on phone bills if you find the subject is irrelevant.

Many of these same broadcasters have



Left Searching multiple engines at once with **Quarterdeck's WebCompass**
Below, left
Video and audio streaming with **Progressive Networks' players** and the **Yahoo News Ticker** in the title bar area

enable you to "surf the web up to 36 times faster", relies on replacing your browser's standard cache with **Connectix'** proprietary "FASTore" technology, squeezing seven times the usual amount of information into the same space in a way that your browser can access more efficiently. Surf Express therefore speeds access only to those pages you have visited at least once before.

Engine room

Search engines are an essential resource for successful net navigation but, as the number of engines online increases, you can find yourself interrogating more and more databases in the search for your chosen subject.

Utilities like **WebCompass** from **Quarterdeck** and **IMSI's WebSleuth** simplify this task by simultaneously submitting your enquiry to multiple engines. The comprehensive results returned are not restricted to a simple list of URLs but also include a summary of the contents of each page identified, and a "relevance" score allowing you to immediately skip to the most likely match.

Adding these utilities to your collection can greatly enhance the productivity of your net connection and acquiring them need not be an expensive consideration. Many can be freely downloaded but perhaps the most useful are the two navigation packages named above, **WebCompass** and **WebSleuth**. Based on the extensive use you will almost instantly find yourself making of either of these packages, they will be such a valuable addition that you will wonder how less enlightened users manage without them.

Nik Rawlinson

seen the advantage of combining the delivery potential of the internet with the multitasking capabilities of modern operating systems, and have come up with the idea of **news tickers**. While a constant video or audio stream might be distracting or obtrusive and occupy untold bandwidth, a text feed can be delivered relatively easily and positioned discreetly on the desktop.

The **BBC** provides a freely downloadable news ticker on its site, while **Yahoo** runs a similar service. By personalising your interests with the "My Yahoo" page of the engine's web site, this ticker can be set to display only the information which is of interest to you and can be positioned either on your task bar or in the title bar area of your current application. Although this utility will work without problems using a modem connection by hooking up to your ISP at set intervals to update the information, it is particularly suited to use on a leased line.

Surf's up, dude

Years ago, some clever bod in a magazine similar to ours renamed the then fledgling "WWW" as the "worldwide wait". Happily, the situation is now changing with the advent of the likes of **Net Accelerator** and **Surf Express** from **IMSI** and **Connectix** respectively.

The premise is simple: for most of the time, your modem is sitting idle while you read the pages you have just downloaded; during this time **Net Accelerator** will scour each link on the active page, downloading, or "prefetching", the related contents. Following one of these links then opens the cached version for immediate access, giving the impression of a faster net connection.

Alternatively, **Surf Express**, which claims to

PCW Details

BBC News

news.bbc.co.uk/hi/english/static/on_air/default.stm

BBC Radio 5 www.bbc.co.uk/radio5/

Connectix www.connectix.com

IMSI www.imsi.co.uk

MacroMedia www.macromedia.com

Progressive Networks www.real.com

Quarterdeck www.quarterdeck.com

Yahoo www.yahoo.co.uk

Uninstallers

In the dark old days of DOS, a program tended to install all its files in its own directory, simply deleting the directory removed all (or almost all) the files. This does not happen with Windows programs. When almost any Windows program loads on your hard disk it scatters its files across multiple directories. This means that simply deleting a program directory is an ineffective way of completely getting rid of a program. Even using the program's own uninstaller or the Add/Remove feature on the Windows Control Panel may not uninstall a program completely. Indeed, more often than not, Add/Remove will inform you that certain files will remain to be deleted manually.

Freeze frame

Many freezes and crashes can be caused by software conflicts, and some of these can be caused by conflicts with files remaining on your hard disk from long-deleted programs. Even when the files don't cause conflicts they can eat up valuable hard-disk space and although huge hard disks are now common, programs are correspondingly large, so space is forever at a premium.

If you think you don't install enough programs to make an uninstaller a worthwhile investment, think again. If you install programs from magazines' CD-ROMs, or purchase shareware or download software from the internet, files will be dumped hither and thither and you are probably losing disk space and perhaps sacrificing system performance. Only you know how much software you really load and unload every month, but you may find an uninstaller a useful investment. In fact, you might find an uninstaller a boon even when you buy a new PC as they often have a ton of pre-loaded software that, nine times out of ten, you'll want to get rid of.

Keep it clean

But uninstallers do more than simply uninstall a program. They are hard-disk management tools. They don't just remove the programs you want removed, they also search your hard disk for space-grabbing files you no longer need:



Left CleanSweep: an excellent feature set, fast, easy-to-use and safe **Below** Uninstaller's redesigned interface. It has features, power and a reasonable price tag **Middle of page** WinDelete comes with a pile of utilities



- duplicate copies of files (Norton does not automatically determine which of your duplicate files is the most recent);
- redundant DLLs (not with Norton);
- VBX files;

- files which have not been used recently; and
- file types which can often be safely deleted.

Most of the latest versions (all of which seem to have been released close to the launch of Windows 98 and on which it would be inadvisable to use them!) also provide internet cleanup. **CleanSweep Deluxe**, for example, removes programs downloaded from the internet, cleans out internet cache files, unwanted cookies, web browser plug-ins and unwanted ActiveX controls.

In addition, most of the uninstallers now archive (otherwise compress or zip) infrequently-used programs, make a compressed backup of a program, move a program to a different drive or folder, and copy a program to another computer. They'll also clean up the Windows Registry, where generally it is wise not to venture.

WinDelete Deluxe, from IMSI, looks positively overburdened with additional tools. It offers virus protection, tools to intercept memory and other types of system crashes, backup, encryption and a

zip utility. Unfortunately, WinDelete 95 suffered serious problems and we didn't receive a copy of WinDelete Deluxe from IMSI in time to run sufficient checks to see whether the flaws had been resolved.

Playing it safe

Safety is of paramount importance. Quarterdeck's CleanSweep Deluxe uses colour coding: green for files that you can safely delete, yellow for files with which it would be advisable to take care, and red for files that it considers you should delete only with extreme caution. Norton doesn't employ colour

coding, but gives warnings when you might be in the process of doing something daft. But if you *should* do something stupid, the uninstallers backup the files which have been

deleted, giving you the opportunity to restore them.

Norton Uninstall Deluxe has a feature called InstallGuard (the same feature is called BackTrack in **Uninstaller**) that backs up every file modified by an installation. This means that if a program alters your configuration files and your system begins to behave badly, you can uninstall the errant program and return everything to how it used to be.

Paul Begg

How uninstallers work

At first glance an uninstaller looks like an application you'll need so infrequently it's not worth the disk space (and they do seem to be getting large!) but you may find you use it far more than you think.

Uninstallers work by taking a "photograph" of your files *before* and *after* an installation, then comparing the two, noting where new files have been put and deleting them accordingly. To uninstall programs not monitored by the uninstaller, most uninstallers also now contain a database of information about the files installed by other programs. In this way it can be certain of eliminating every bit of detritus.

PCW Details

CleanSweep Deluxe 3

Price £49.99 (£42.55 ex VAT)

Contact Quarterdeck 01628 666322
www.globalchat.com/qdeck/int/

Norton Uninstall Deluxe

Price £45.80 (£38.98 ex VAT)

Contact Symantec 01628 592222
www.symantec.co.uk/

Power Cleaner

Price £24.95 (£21.23 ex VAT)

Contact DataBecker 01420 22707
www.data-becker.co.uk/

Uninstaller 5

Price £34.99 (£29.78 ex VAT)

Contact Cybermedia 0800 973631
www.cybermedia.com/

WinDelete Deluxe

Price £34.99 (£29.78 ex VAT)

Contact IMSI 0181 581 2000
www.imsiuk.co.uk/

Mobile Computing

I have to warn you: there is just one tiny bit of cable that stands between the omnipotent techno-warrior and a bloke with a lump of industrial detritus slung from his shoulder. I know this to be a fact because of the number of times I've carefully prepared for travel to some far-off land, packing my laptop, modem, software and cables, thinking that the last thing I must do is forget some essential piece of kit. But sure enough, I forget that little bit that goes between the PC Card modem and the phone socket, rendering the whole PC almost useless and leaving me to lug 20lbs-worth of extra baggage just for fun.

Having done this enough times for travelling to be the source of some expectant amusement on my wife's behalf, I've now carefully thought about how to avoid it by compiling a list of the essential utilities to take with me whenever I'm travelling.

Life's little essentials

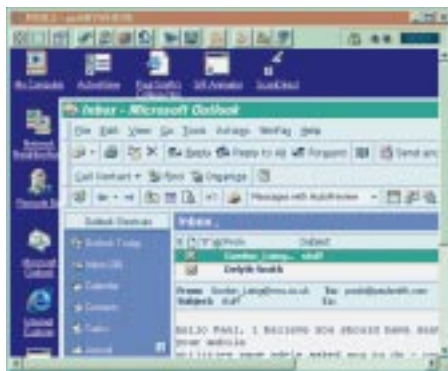
Norton Mobile Essentials prepares the traveller for their imminent journey. It runs health checks on your computer by running Windows' Scandisk, and your modem — although it seemed to think I had no dial tone even though I could hear it as it ran its tests. It can also back up essential files before you go.

Moving from location to location often involves tedious switching of time zones, dial-up "connectoids", printer and network settings. Mobile Essentials can automate this by localising all of these at logon, when you tell it what location you're in. It also has a feature, Before You Go, that gives you information about your destination. It shows you the phone and electricity adapters you will need and can link you to a Symantec travel site that will tell you, briefly, about your destination and book hotels and cars for you. There's even a packing checklist so you may never forget that little cable again.

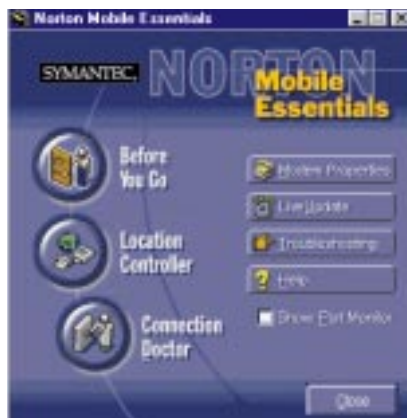
Any time, any place, Anywhere

The ability to connect with the internet is one feature of travelling. The ability to connect to your office PC or network is another kettle of fish altogether. Whether you want to connect over a modem to your LAN, as if you were using a network card, or want to control your office PC as if you were sitting at your desk, or you just want to exchange files, **pcAnywhere** or **LapLink** can do it for you.

Imagine you're in Phnom Penh with nothing but your laptop. You connect to the internet, log on to your PC in the office and, all of sudden, you're working on your machine



Above With **PC Anywhere** you can control another PC from a remote location
Right Get all your cables, settings and applications sorted before you go



back home — albeit with a somewhat distressing refresh rate. Spoofing network connections is just as easy. You can even set up a gateway and let, say, a modem on one networked PC serve the whole LAN.

Intelligent file transfers are also a feature of these products, particularly for synchronising directories automatically.

Upwardly mobile

For more sophisticated synchronisations, consider **Norton Mobile Update**. This monitors files or folders on your network, notifying you by email when they've changed, with updates of the changes. For those relying on centralised presentations, price lists or inventory databases, Mobile Update does all the work of monitoring these for changes, compressing and sending you only the changes in a file, not the whole file itself. This is a one-way technology so it won't help with co-operative documents but it's a great solution for those who need it.

Comms is all for nought if you're stuck in the middle of a forest. Mobile data communications is another great cable-loss opportunity, so you might consider one of those nifty phones with an IrDA port, like the **Nokia 6110**.

If you use one of the more recent Nokias, you should also consider the **Nokia Data Suite**, which lets you

You can change settings, but only if you have the original disk. Otherwise, you'll never even know that CyberAngel is on the system... until the police arrive

dispense with a PCCard modem altogether. It just connects the phone to a COM or IrDA port and you're surfing. CDS also lets you manage SMS text and phone numbers on the phone.

On location

So, you've now got all your software and your cables. What can possibly go wrong? Well, you could lose the whole darn lot. If someone lifts your laptop, how are you going to find it? Well, the **CyberAngel** will find it for you (see review, p99). As soon as someone plugs your laptop into a phone line, it will pass all

sorts of information to a call monitoring station that can inform you immediately of the laptop's location. It has various security features such as unprompted password entry, full keyboard or COM-port lockouts and star status.

Foreign travel will cause you all sorts of problems if you try and use your Demon account, as you'll need a different ISP abroad. One solution is to get an account with one of the big three, **CompuServe**, **AOL** or **MSN**. All have worldwide access nodes but check that

they serve your destination. It's disappointing to get all the way to Ulan Batur, only to find that your ISP is not well represented there.

Paul Smith

PCW Details

AOL 0800 3765432 www.aol.com

CompuServe 0990 000400

www.compuserve.com

MSN 0345 002000 www.msn.com

Norton products

Prices Mobile Essentials £92.83 (£79 ex VAT).

Mobile Update £680.33 (£579 ex VAT), single

server/10-user package).

pcAnywhere32 £175.08 (£149 ex VAT)

Contact Symantec 0171 616 5600

www.symantec.co.uk

LapLink 7.5

Price £176.19 (£149.95 ex VAT)

Contact Traveling Software 01344 383232

www.travelingsoftware.com

Cellular Data Suite 1.2

Price £99.99 (£84.26 ex VAT)

Contact Nokia 0990 003110 www.nokia.com

The CyberAngel

Price £69.95 (£59.53 ex VAT) inc. one year's

monitoring. Subsequent year: £49.95

(£42.17 ex VAT)

Contact Computer Sentry Software
0800 7834655 www.cyberangel.co.uk

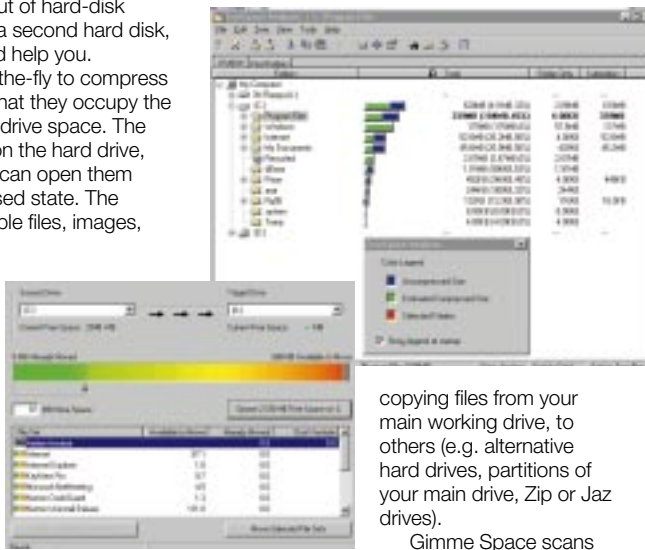
Hard Disk Capacity

If you are fast running out of hard-disk space but you can't fit a second hard disk, then these utilities could help you.

FreeSpace works on-the-fly to compress and uncompress files so that they occupy the minimum amount of hard-drive space. The compressed files remain on the hard drive, available for use, and you can open them direct from their compressed state. The system works for executable files, images, sounds and the like so there is no need to go through the process of uncompressing a file before you use it.

When FreeSpace is first installed it conducts an audit of your hard drive and provides a graphic representation of how much it can compress. FreeSpace will work in the background, for example compressing all files of a certain type whenever it encounters them. Alternatively, a tool called QuickSpace can be asked to free-up a specified amount of space. It will scan the hard drive and produce a ranked list of likely candidates from which you can select.

Gimme Space claims to free-up room on your hard drive but with no programs being uninstalled, no file compression and no files deleted. So how does it achieve its aim? By



copying files from your main working drive, to others (e.g. alternative hard drives, partitions of your main drive, Zip or Jaz drives).

Gimme Space scans your hard drive via the shortcuts in the Start menu and makes an educated guess about what it is safe to move and what it should not touch. Scan completed, it offers you the chance to choose files by moving a pointer along a colour-coded slider. The green part covers files which can be moved without concern. Files included in the yellow and orange portion might need individual consideration, those in the red area should be left alone. As you move the slider

Left The FreeSpace Analyser shows that there is potential to generate more hard-drive space

Below, left Slide the pointer to copy files from your hard drive to another medium and free-up space

you get a report of how much disc space you can regain.

Gimme Space is a compromise between removing rarely-used components and living with them consuming huge chunks of a hard drive. But you will need a fair-sized secondary storage medium to use it.

Sandra Vogel

PCW Details

FreeSpace

Price £29.38 (£25 ex VAT)

Contact 01297 555222 www.mijenix.com

Gimme Space

Price £29.95 (£24.49 ex VAT)

Contact Softguard 01 189 814230
www.alphasoftware.com

Zip utilities

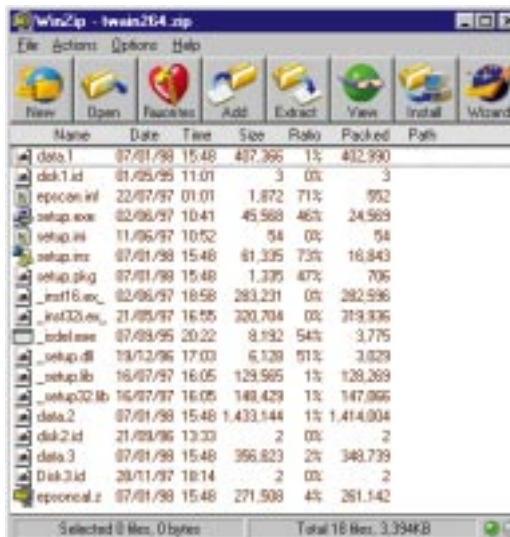
File compression utilities serve two purposes. Firstly, they can decrease file size, taking less disk space and/or transfer time. Secondly, they can pack a number of files into a single one — without which modem or network transfer would be a nightmare when attempting, say, to download all the component files of an application.

Although there are many methods for compressing multiple files, by far the most popular is Phil Katz's **Zip** format.

The author's own Zipping/Unzipping **PKZIP** is available on a multitude of platforms including DOS, Windows, Unix and Mac. It is not, however, the easiest application to use and there are many other applications which have a friendlier Windows front-end while supporting the standard Zip (and other) formats.

WinZip is popular and easy to use, adding a shell extension to Windows Explorer which enables you to select multiple files and then right-click to "Add to Zip".

Conversely, double-clicking on a Zip file lists the contents ready for unzipping to the destination of your choice and there's an optional Wizard-based interface to make it all



WinZip: lots of options in any easy-to-use interface

having to rely on system-level compression software such as Windows DriveSpace. Like WinZip, it will also unzip files directly from the internet or email attachments.

Although there are Windows 3.1 versions of both the above, **Drag & Zip** deserves a special mention as it provides a very flexible add-on to the File Manager with, as its name suggests, a drag-and-drop interface for creating Zips.

All the above are available in evaluation versions, downloadable from the sites below ("PCW Details") and one final point is that they can be used to create self-extracting executable files, so the recipient doesn't need any unzipping software installed.

Tim Nott

as painless as possible. If you're zipping to floppy disks, there's an option to span multiple disks to overcome the size limit.

Zip Magic goes a little further in that Zip files are shown "transparently" as special folders. You can work with the contents, opening files or running programs without having to unzip them. This makes it especially useful for compressing entire folders full of files to save space on your hard disk without

PCW Details

Drag and Zip

\$25.00 www.canyonsw.com

PKZip

\$39.00 www.pkware.com

Winzip

\$29.00 www.winzip.com

Zip Magic 98

\$39.95 www.mijenix.com

The PCW team's top utilities

An email sent around the PCW office asking which were the best utilities elicited the same answer from everyone: RealAudio and WinZip. However, there were a few others we could not live without.

Prime among these has to be **Adobe Acrobat Reader**. Essentially, Acrobat takes the PostScript description of documents and distills it to create PDF (portable document format) files. Now that the Distiller has come down in price and the Reader is free to download, there is no end of documents available on the web in PDF form. At PCW we archive our back issues in PDF and store them on CD (see *our Reader Offers*, pp 128 & 286). It is far easier, quicker and less tiring than searching through the printed version.

If you sit at a monitor all day, it is important that you set it up properly. To do this and to test all the monitors we review at PCW, we use **Displaymate** for Windows. Displaymate consists of numerous test patterns accompanied by instructions on what problems you should be looking out for, and what means there are by which to correct them. This allows you to make the most of your monitor and reveal those situations where nothing can be done.

Notes of note

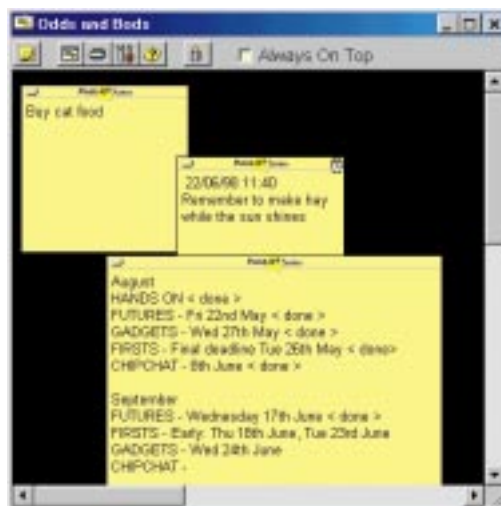
An immediate hit with our reviews editor, Adam Evans, were **Software Post-It Notes**. "They are just like the real thing but better. You can stick them anywhere on your desktop or documents, and do full text searches and set reminders," says Adam.

The choice of our associate editor, Clive Akass, is a utility that is often overlooked: "My favourite utility is the **Windows Notepad**, which tends to be taken for granted. It is very useful as a general-purpose file viewer. Make sure that a Notepad icon sits on your desktop, and drag over Readme, INI and other text files you want to read. Viewing is almost instantaneous, and very useful when you are browsing directories and trying to make sense of their contents. Notepad treats everything as text but will often show you enough of a binary file to guess its purpose."

The Right stuff

Clive has also recently been infuriated by interrupted downloads. "**GetRight** was recommended by several readers following my news piece (PCW, July) on how poorly the web copes with interrupted downloads. GetRight monitors clicks in your browser (Netscape or Explorer) and takes over FTP or HTTP downloads, resuming from the break point whenever possible if an interruption occurs. It thus saves you aggravation and phone charges.

"GetRight will also tell you when you are using a server that does not support resumes (Netscape's ftp site does; <ftp.microsoft.co.uk> does not). You can then bitch at the culprits, perhaps persuading them to mend their ways!



Left Stay organised in a disorganised world with 3M's Software Post-It Notes

Below, left Acrobat Reader: an invaluable tool for accessing old copies of PCW!

Scan-can

Features editor Adele Dyer and associate editor Clive Akass are two people in the PCW office who would not be without their PaperPort scanners. The utility shipped with these document scanners is also known as **PaperPort** and comes with various other scanners. It is available as a standalone utility; **PaperPort Deluxe**. This lets you file your scans, connects to your printer and fax machine to allow drag-and-drop copying and faxing, as well as to over 100 other applications. It comes with OCR software so you can drag a scan on to one of the buttons representing an application and the OCR will kick in and recognise the document as it goes across. It is truly indispensable for coping with piles of paper.



GetRight also supports timed and batch downloads, and checks routinely for the fastest site containing your target file. It costs \$17.50 from www.getright.com, where you can also download a version."

Managing editor Gordon Laing harks back to the old days when he was obsessed with graphics and getting the best out of storage devices. "If you're into 'proper' Type-1 fonts, you simply cannot live without **Adobe Type Manager**. The latest Deluxe version 4, available for 95, NT and Mac, does a neat job of managing groups of fonts and even supports multiple masters, allowing you to tweak their attributes to your heart's content.

"Those who have discovered the joys of SCSI for high performance I/O should definitely own a copy of **Adaptec's** brand-new **EZ-SCSI 5** which, along with managing and benchmarking all your SCSI devices, also includes a variety of handy utilities to write CDs, restore drives and backup to tape. It's ready for Windows 98, too, and incorporates web-checkup to make sure you're using the latest drivers.

"SCSI tape users should look into a copy of Seagate's **Direct Tape Access** which treats tapes as removable disks, allowing you to happily drag files on and off the drive as if it were a normal disk drive (although far more slowly)."

PCW Details

3M Software Post-It Notes
Price £20 (£17.02 ex VAT)
Contact 3M 0990 360036 www.3m.com

Adaptec EZ-SCSI 5
Price £64.63 (£55 ex VAT)
Contact Adaptec 01276 854500
www.adaptec.com

Adobe Acrobat
FREE download, or from our PCW cover CD

Adobe Type Manager Deluxe
Price £57.57 (£49 ex VAT)
Contact Adobe 0181 606 4001
www.adobe.com

Displaymate
Price £57.58 (£49 ex VAT)
Contact Meko 01276 22677
www.displaymate.com

GetRight
Price \$17.50
Contact Headlight Software www.getright.com

Seagate Direct Tape Access
Price £52.88 (£45 ex VAT)
Contact Seagate Software 01628 586435
www.seagatesoftware.com

Visioneer PaperPort Deluxe
Price £69.33 (£59 ex VAT)
Contact Visioneer 0800 973245
www.visioneer.com

Old PCs never die...

...they just ruin the environment. But all this is about to change. A new EU directive may well encourage a booming second-hand PC market, as Susan Pederson reports.

It's always an exciting day when you bring home a new PC. But once you've unpacked it and set it up, there's still the problem of what to do with the old one. Once a faithful friend and workmate, it's now a dust-covered object of derision.

You certainly don't want it any more, yet just chucking it into the bin means you're adding to an ever-growing mountain of electronic junk and wasting its future potential. The Gartner Group estimates that Britons will

throw out over one million PCs this year alone. By next year, more than 42 million will be consigned to the skip, worldwide. In Europe alone, this amounts to over six million tons of glass, metal and silicon, 80 percent of which could be recycled.

But the environmental consequences don't stop there. PCs can contain harmful substances such as heavy metals and CFCs and, if they're left in a landfill, these can work their way into the water supply.

The European Union (EU) has published a proposal

for dealing with electronic waste and it is expected that a directive will arrive towards the end of this year. It will likely place a heavier responsibility on PC makers to deal with the problem of obsolete kit. But the end-user will also have to think carefully about what to do with their computer equipment when it reaches the end of its useful life.

Business is booming

The EU directive will have a huge impact on the PC industry. Facilities for recycling and refurbishing computer equipment have increased enormously over the past year and look set to become a minor boom industry by the turn of the century.

Kevin Riches, managing director of Technical Asset Management (TAM), says: "There are plenty of scrap merchants who will destroy a PC and break it up, but

that's not a very efficient way of doing it. Our view is that re-use is always better than recycling." TAM takes old PC equipment from mainly large corporate clients, reconditions it, and sells it on. All the equipment is tested, cleaned, and wiped clear of data before it is sold. Buyers even get a 90-day warranty.

Riches says he cannot think of another industry where manufacturers will be required to deal with their product long after it has been sold. "Companies will have to start looking to people like us to manage their equipment for them," he says. "We can extend its life and add to its value." He remembers that the first person to whom TAM ever sold a PC has now had it refurbished and replaced three times. As he points out, one man's 386 is another man's server.

"It's all about finding new markets for old products," he says. "We don't think twice about buying a second-hand car. Why not buy a second-hand PC?"

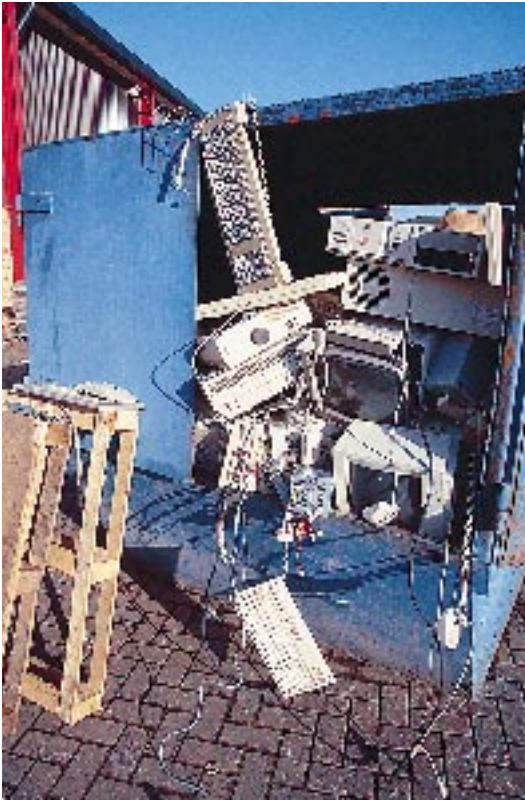
Second-hand PCs could very well turn out to be the galvanising force that transforms Britain into a nation of computer users. Making a PC available for only a couple of hundred pounds will finally bring it out of its traditional luxury niche market and into the hands of people who really need it. TAM soon plans to start selling a Windows-based Web PC for £249 (inc. VAT) and a DOS-based internet machine for only £125.

Seconds out — to developing countries

Riches says: "Why not have one in each bedroom? At that price, you're not saying 'this is a piece of technology', you're saying, 'this is like a video or a toaster'." This democratising force won't just have an effect here in Britain. Many charities are springing up to send unwanted equipment to developing countries who can use it in health clinics or educational facilities. And if the concept of the second-hand PC really takes off, it could also prove a nail in the coffin for the much-vaunted but slow-to-materialise Web TV technology.

Attitude problem

No other sector has seen the same kind of manufacturing growth, nor the same kind of cavalier approach towards its redundant products, as the PC industry. The environmental costs of this attitude are high. But Britain also cannot afford to neglect the possibility for social change that these so-called unwanted PCs offer. The combination of increased charges for landfill use, stronger environmental legislation and organisations eager to change a sow's ear into a silk purse, will give us the chance to achieve what politicians have been going on about for years: a wired world. ■



Carefully — and responsibly — disposing of unwanted PC equipment can bring social, financial and environmental rewards

Shrink to bit

Toby Howard delves into nanotechnology, the science of construction at atomic levels. Just a few atoms could comprise an immensely powerful nanocomputer.

Here's a date for your diary: 1st November, 2011. According to a group of researchers, who call themselves the Nanocomputer Dream Team, that's the day they'll unveil a revolutionary computer, the most powerful ever seen. Their "nanocomputer" will be made out of just a few atoms.

First suggested by Richard Feynman in 1959, the idea of "nanotechnology" (constructing at the atomic level) is now a major research topic. Theoreticians have already come up with designs for simple mechanical structures like bearings, hinges, gears and pumps, each made from a few collections of atoms. These currently exist only as computer simulations and the race is on to fabricate the designs and prove that they can work.

Moving individual atoms around at will has already been demonstrated in the lab. In 1989, scientists at IBM used an electron microscope to shuffle 35 xenon atoms into the shape of their company's logo. Since then, a team at IBM's Zurich laboratory has achieved the incredible feat of creating a working abacus on the atomic scale (see illustration, right). Each bead is a single molecule of buckminsterfullerene (a "buckyball"), comprising 60 atoms of carbon, linked into a football shape. The beads slide up and down a copper plate, nudged by the tip of an electron microscope www.zurich.ibm.com/News/Abacus/.

World domination, molecular-style

The Nanocomputer Dream Team wants to use these techniques to build an atomic computer. Such a computer, they say, can be used to control simple molecular construction machines which can then build more complex molecular devices, ultimately giving complete control of the molecular world.

The driving force behind the Dream Team is Bill Spence, publisher of *Nanotechnology* magazine. Spence is convinced that the technology can be made to work, and has enlisted the help of over 300 enthusiasts from diverse backgrounds, from chemists to AI researchers. The whole team has never met. They correspond by email and pool their ideas on the web. There's only one problem: nobody is quite sure how to build a digital nanocomputer.

Hot rod

The most promising idea is "rod logic", invented by nanotechnology pioneer Eric Drexler, now chairman of the leading nano think-tank The Foresight Institute www.foresight.org. Rod logic uses stiff rods made from short chains of carbon atoms. Around each rod sits a "knob" made of a ring of atoms. The rods are fitted into

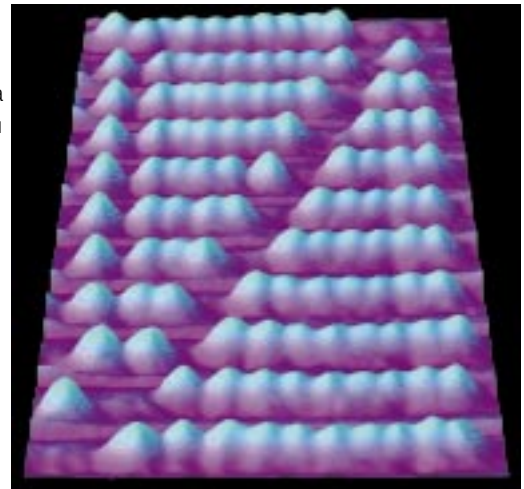
an interlocking lattice, where each rod can slide between two positions and be reset by a "spring" made of another few atoms. Drexler has shown how to use such an arrangement to achieve the effect of a conventional electronic transistor, where the flow of current in one wire is switched by current in a different wire. Once you have transistors, you can build a NAND gate. From NAND gates you can construct every other logic element a computer needs.

Apart from the immensely difficult problem of physically piecing together these molecular structures, massive calculations are required to determine whether particular molecular configurations are even possible. The Dream Team will perform these molecular simulation calculations using "metacomputing" where each person's PC performs a tiny part of the overall calculation, and the results are collated on the web (see *Futures*, PCW June). There are already prototype tools for experimenting with molecular configurations, such as NanoCAD, a freeware nano design system including Java source code [www.world.std.com/~wware/ncad.html](http://world.std.com/~wware/ncad.html).

Atomic time bomb

This may all sound like pie in the sky, but there's serious research and development money being spent on nanotechnology. While they may lack actual working prototypes of their technology, nanotechnologists are certainly not short of ideas. Once you have the ability to make molecular machines, the possibilities are amazing and often bizarre. One idea is "utility fog", where billions of sub-microscopic molecular robots each containing a nanocomputer are linked together to form a solid mass. Controlled by a master nanocomputer, the robots could alter their configurations to create any object you like.

Nanotechnology does come with one tiny drawback, though. What happens if a molecular machine goes haywire and, instead of building, starts demolishing the molecules around it? The world would, quite literally, fall apart. Nanocomputers, if they ever appear, will be extraordinary. But if, like most computer systems, they have bugs, they could be very nasty things indeed. ■



Bucking the trend: a working abacus on the atomic scale. Each bead is a single molecule of buckminsterfullerene, a "buckyball", comprising 60 carbon atoms in a football shape

Hands On Contents

■ *Hands On* is the place where readers can contribute to *PCW* and, as always, we'll pay for anything we use. Macros, sections of code, and hints and tips will be rewarded with a £20 book or record token (please say which you would prefer) and we will pay hard cash for longer, more involved pieces. Please include relevant screenshots in .GIF format. All submissions should be emailed to the author of the appropriate column or snailmailed to Hands On, Personal Computer World Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on 0171 316 9313. We are constantly working to improve the contents of Hands On. If you have any suggestions, send them to the Editor at the address above, or email them to pcw@vnu.co.uk.

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PCW/Hands On on CD-ROM

Remember, you saw it here first — that tip, trick, advice or review. And you can find it again: there's a whole year's worth of Hands On columns on our monthly CD-ROM. So if you've got a problem, or if that handy hint is on the tip of your tongue, don't sit and sweat: the answer is at your fingertips, on our cover CD.



Colour under control

Don't be blue, you don't *have* to put up with dodgy colour differences between a scanned image and the printed version. Ken McMahon shows you how to fix those colour matches.

Colour management systems (CMS) are increasingly being adopted by graphics professionals who need to ensure colour consistency from one end of the production process to the other. They need to know that a picture is always going to look the same regardless of the scanner that was used to obtain it, the monitor that displays it or the printer that prints it.

But do you need a CMS at home? Well, if you find it irritating that your holiday snaps fresh back from the processor look bright, sparkling and realistic but then, having scanned them, they appear dense and blue on your monitor and look washed out by the time they roll off your inkjet printer, the answer is probably "yes".

Can you do without a CMS?

There are some simple steps you can take to improve the colour fidelity of your system without resorting to CMS software. These concern the correct adjustment of your

How a CMS works

Colour management systems work by measuring the output of a device such as a scanner or a printer, comparing it with a standard reference and creating a device profile which defines how the target device varies from the standard.

The colour management software then uses the profile to adjust the device's output to conform to a standard colour space.

Theoretically at least, what you see on your monitor should be exactly what you see on your printer. In practice, because of the different physics involved, this is impossible (monitors transmit red, green and blue light, whereas printers usually reflect yellow, magenta, cyan and black) but you should see a big improvement.

monitor. The first thing to do when setting up your monitor is... nothing, for at least an hour. It takes this long for the circuitry to reach its usual operating temperature and any adjustments you make during the warm-up period will be a waste of time.

Find a suitable test picture with a good range of tones from black through to white, and set the contrast and brightness controls so that the blacks are black, the whites are white and you get the widest range of greys in between. Once the controls are set, and particularly if they are of the wheel type, make sure they are not moved from this position.

You can get advice on how to set up your monitor from the Computer Suppliers Federation web site at www.csf.org.uk where you can also download free monitor-testing software.

Next, if your monitor has a colour temperature option, set it at around 6,000 Kelvin (generally, monitors default to 9,000 Kelvin which is much bluer than daylight).

Lastly, make sure your monitor is situated away from bright sources of light and any large areas of strong colour. It's not a good idea, for instance, to attempt to calibrate your monitor while wearing a bright red T-shirt. If your wallpaper is bright red, you'll just have to live with it; but if you move the computer to your green room, you'll have to re-calibrate.

Game, test and match

Finally, print out a test picture on your printer and using this as a reference make brightness, contrast and colour temperature control adjustments to your monitor until you achieve the closest possible match.

You can get surprisingly good results using this method. Usually the problem is

that you can match some colours quite closely — reds and blues, say — but the greens are miles out. When you manage to get the greens looking OK, the reds drift.

If, having got this far, you're still dissatisfied with things, you will need to resort to a CMS.

How to calibrate a setup using a CMS

We are going to look at how to use a CMS to calibrate a scanner/monitor/printer setup using Corel's Colour Manager 7, which ships with CorelDraw 7. Although the detail might vary, the approach will be similar regarding other graphics applications with CMS support.

First, open the Corel Colour Manager 7 wizard from the graphics utilities submenu of the CorelDraw 7 menu on the start bar. The initial screen has four list boxes from which you can select a profile for your scanner, monitor and composite (perhaps a colour inkjet or laser) printer, and separations (usually an imagesetter) printer; unless you are very lucky, you are unlikely to find what you are looking for here.

Each list box provides several options: use a generic profile, generate or edit a profile, get a profile from disc, and install a profile. You can try pressing the auto colour profile selection button, which will choose profiles based on your Control Panel settings, but the most likely result of this is that the required profile will be unavailable and the generic profile will be used.

Using someone else's profile is preferable to generating your own. The first place to look is on CD1 of CorelDraw 7. If you're using a different version, or another application, use Find to check the CDs or discs for files ending in .ICM. If you can't find what you're looking for on your

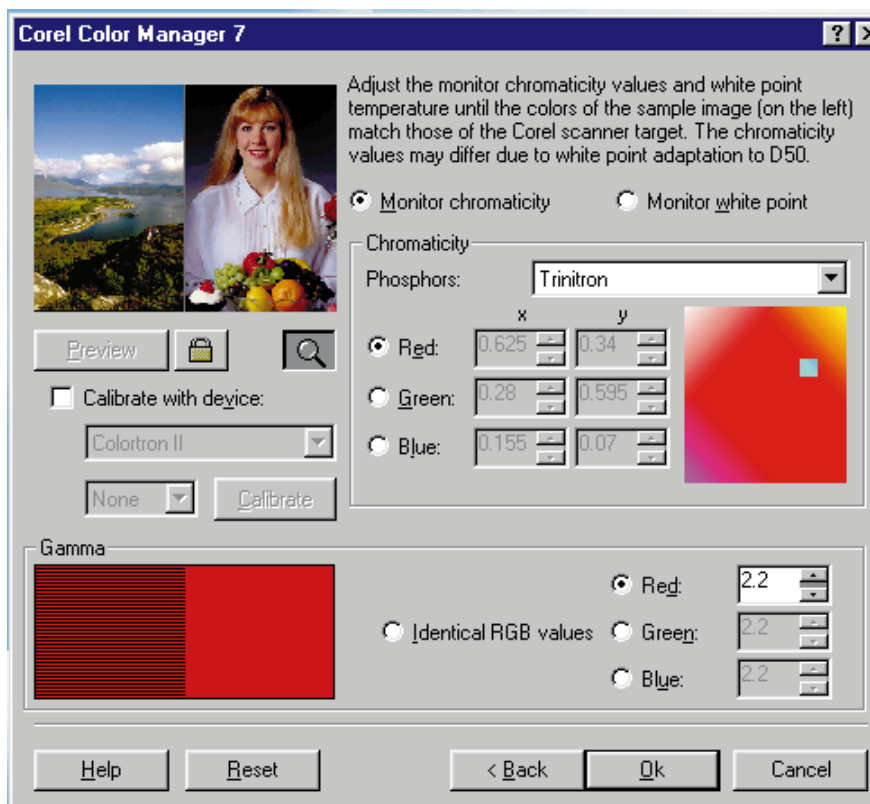
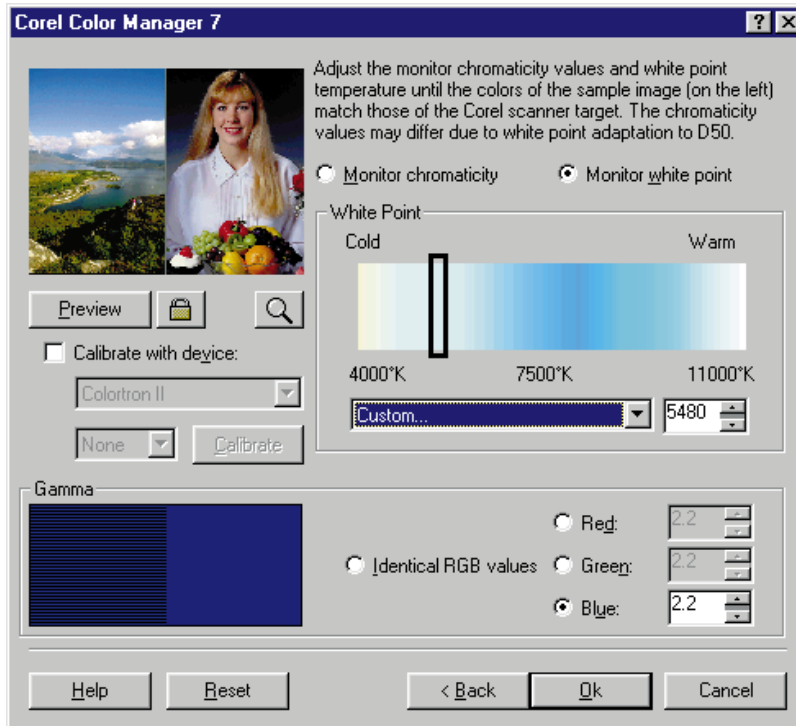


Fig 1 (above) Stage One of the process. Calibrate your monitor visually by matching the reference pictures, or using the white point and gamma settings

Fig 2 (right) Use the slider to set the white point, or choose "std illuminant 5,000K" from the list box



application discs, check the software supplied with your device — printer and scanner driver discs, and anything that looks like it might contain colour information. A quick scan through the documentation might yield some clues.

Finally, try the device manufacturer's web site, followed by your graphics application developer's web site. There's a

good selection of profiles at www.corel.com/support/ftpsite/pub/coreldraw/colorprofiles/index.htm. If you cannot find a profile for your device, you will need to edit an existing profile or create one yourself. If you can find a match for your device, so much the better, but bear in mind that a similar model number may not indicate similar characteristics.

Creating a profile for your monitor

Let's assume a worst-case scenario where you have to generate profiles for each of the three devices, starting with your monitor.

First select Generate, or Edit a profile from the monitor list box (don't forget to make sure your monitor has been on for at least an hour), enter the manufacturer and model name and click Next.

Compare the picture in the top left of the calibration panel with the hard copy supplied with CorelDraw 7 (Fig 1): you can get a better look by clicking the magnifier. Click the white point radio button. If it's not already selected, choose "std illuminant 5,000K" (Fig 2).

Next, adjust the gamma for red, green and blue. To do this, stand back far enough so that you can't see the horizontal lines in the colour patch on the left (or squint to achieve the same effect) and adjust the values until the two swatches match, then repeat the process for green and blue. You will probably not need to adjust the Chromaticity values, but if your monitor

matches one of the types selected in the list box, make the appropriate selection. This is particularly worth doing if your monitor has a Sony Trinitron or Mitsubishi Diamondtron tube.

Now compare the picture in the top left of the calibration panel with the hard copy supplied with CorelDraw 7 (remember, you can get a better look by clicking the magnifier). They should match quite closely. If they don't, make further fine adjustments to the gamma and white point.

Creating a profile for your scanner

To create a profile for your scanner, you simply scan the target supplied by Corel and the colour manager wizard compares it with a reference file to generate the profile.

First, select Generate or Redo profile from the list box, then type in the make and model of your scanner. Then either scan the target or, if you have already done so,

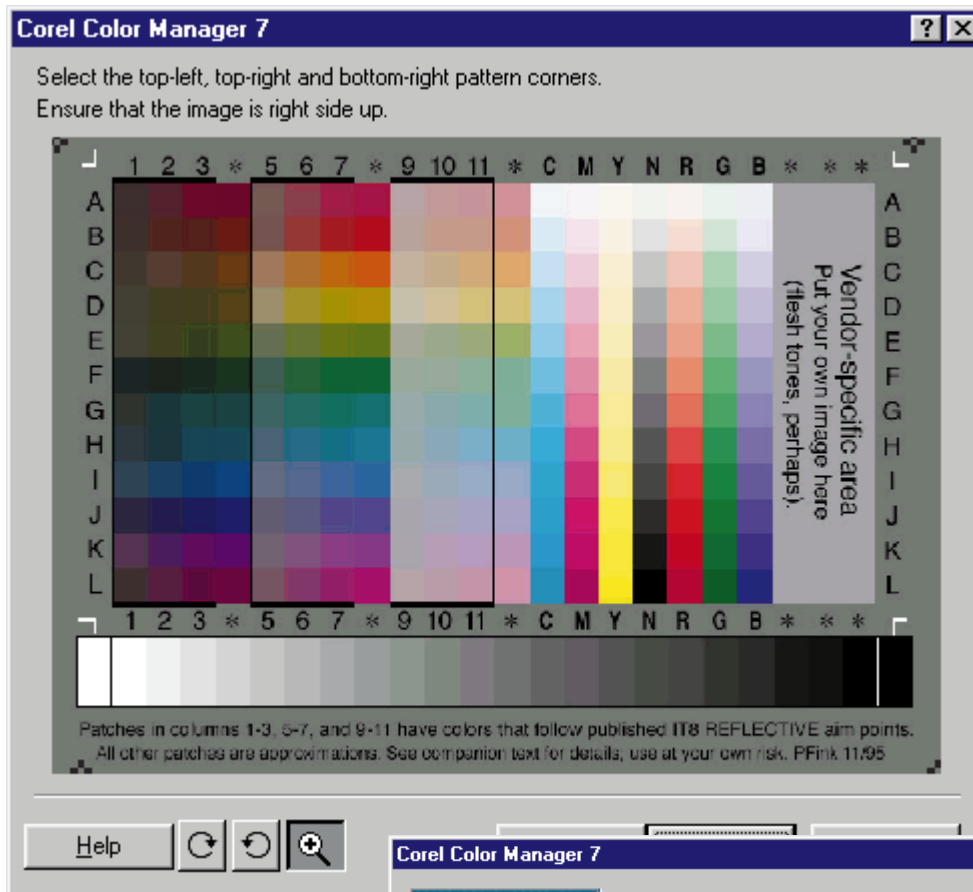


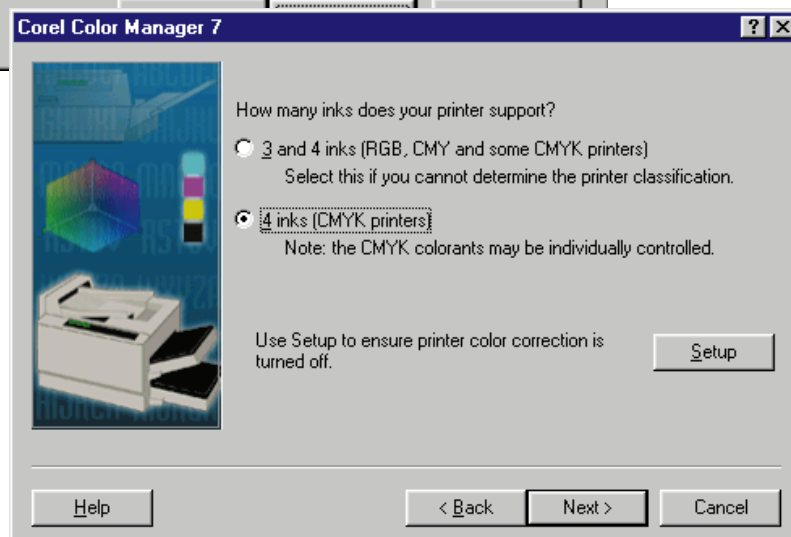
Fig 3 (left) Having scanned the target, you need to indicate the corner swatches so the patches can be compared with those in the reference file

Fig 4 (below) It's essential to get this right. You need to check if your printer has a separate black ink cartridge or whether it makes black by combining cyan, yellow and magenta

select Retrieve from file.

Next, you need to tell the wizard whether you are using the Corel Target or a third-party version. Both Kodak and Agfa produce targets known as IT-8 targets (see *our group test of scanners, p168*) and you'll get more accurate results using these rather than the Corel's.

If your scanner has a transparency adapter you'll need to create two profiles: for reflective and for transparent material. You'll need both a reflective and a transparent target. The targets are supplied with a corresponding data reference file on disc. If you're using one of these targets, the next step is to tell the wizard the location of the reference data file. If you're using the Corel



It works out the position of the fourth corner itself. When you click Calculate, the colour manager compares the reading from each of the swatches on the scanned target with the data in

target, just click the appropriate button.

You now need to position three crosshairs on the target image to indicate the position of the corner swatches (Fig 3).

the reference file, and compiles the profile.

Creating a profile for your printer

There are two methods for creating a printer profile. Unfortunately, the best method relies on the use of expensive equipment that you are unlikely to have, or want to buy.

The file method involves printing a test pattern of coloured swatches and measuring each of them with a device called a colorimeter, or spectrophotometer, then entering the values into a measurement file.

Mere mortals will more likely make do with the scanner method. This more or less

Which CMS should you use?

Until recently, manufacturers produced their own proprietary systems, Agfa's Fototune being one such example. With the advent of the International Colour Consortium this has all changed, and nearly all CMSs use the open standard ICC colour profile.

There is a confusing variety of CMS around, but two that lead the field are Apple's Colorsync and Kodak's KCMS. You can buy a product like Agfa's Colortune to produce ICC colour profiles, but this shouldn't be necessary as many are available from device manufacturers and software developers. Adobe and Corel's products incorporate ICC-compliant CMSs which allow you to produce your own profiles.

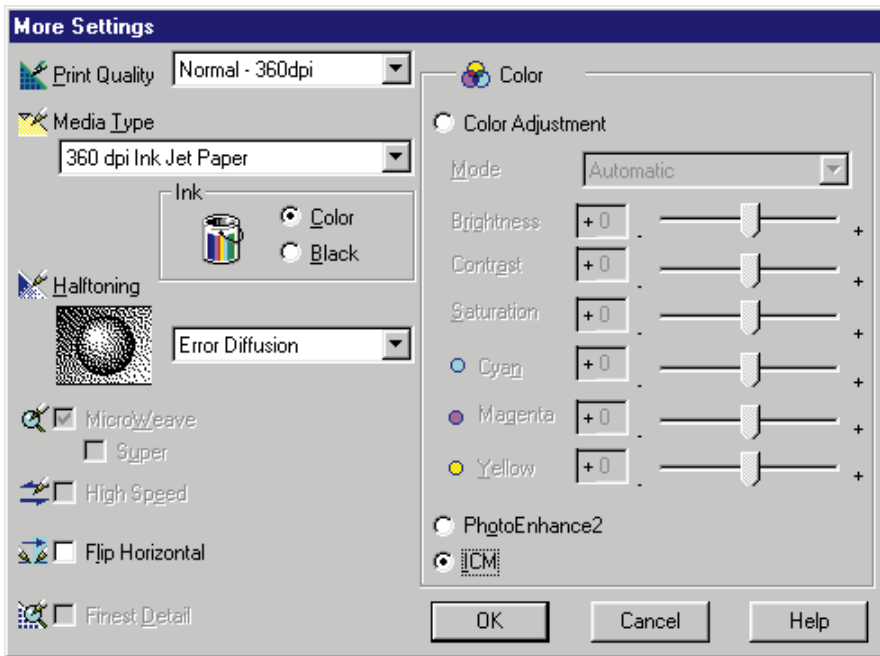


Fig 5 Make sure you turn off your printer's built-in colour calibration. The Epson Stylus Photo 700 has a CMS radio button. Others should provide some method of disabling colour correction

effectively replaces the colorimeter with your scanner. You first print out the test pattern, then scan it, and the Colour Manager wizard generates a profile by making a comparison between the original data and what has become of it having passed out of your printer and into your scanner.

The weak link here is the scanner which, although it will have been calibrated (do make sure you calibrate the scanner before the printer) will not measure up to a colorimeter from the point of view of accuracy. The process is similar in practice to that of scanner calibration.

First, select Generate or tune a profile from the list box and then select from either CMY or CMYK depending on whether your printer uses the three process colours to produce black, or has a separate black ink cartridge (Fig 4) — check the documentation or lift the cover and have a look. If you are producing a profile for the Epson Stylus Photo 700 (with six inks) choose CMYK.

Next, click setup to configure the printer's properties and turn off any colour correction options. The Stylus Photo 700 has a check box for CMS and you should

select this. The Stylus Colour 500 has a radio button to disable colour matching, and if your printer has colour matching facilities there should be a means of disabling it (Fig 5) from somewhere within the properties dialog box.

According to Corel, owners of some models of HP 800 Series printers (and possibly Series 500 and 1200) will be in for a disappointment as these models are shipped with colour management built into the printer driver. This cannot be disabled and so any effort you make at producing a profile will be fruitless.

Next, you need to tell the wizard what kind of printer you have, select inkjet, laser, dye sub or whatever from the list box, click the scanner method button and print the test pattern. There's an option here to reduce the number of swatches (Fig 6), but leave it on the default setting of 200. It will take a little longer to print, but you'll get better results.

Now scan the test pattern in RGB colour mode, save the file and point the wizard to its location. The wizard will generate a profile based on the differences between the original file and the one you have just printed and scanned.

Watch out — there's glossy paper about

Don't forget that if you change the drivers for any of your devices, you will need to generate a new profile. Be particularly careful of changing the colour depth of your monitor (to play games, say) and forgetting to change it back again. Printing on different kinds of paper will also radically affect the output quality and if you regularly print on special glossy paper, it's probably worth creating a profile just for that.



Fig 6 As with the scanner target, you need to tell the wizard where the corners of the printer target are so that it can match the swatches with the reference data and create the profile. The more patches you print, the more accurate will be the profile

PCW Contacts

Write to Ken McMahon c/o the PCW office (address, p10) or email him at graphics@pcw.co.uk

www.agfahome.com

Profiles for Agfa's proprietary phototune system and information on ICC-compliant Colortune software.

www.colour.org

The International Colour Consortium, developers of the ICC open standard for device colour profiles.

www.corel.com/support/ftp/site/pub/coreldraw/colorprofiles/index.htm

Downloadable ICC profiles for a range of popular inkjet printers.

www.corel.com/support/newsgroup.htm

Corel newsgroups, including one for printing, scanning and colour management.

www.csf.org.uk

Advice on how to adjust your monitor, and a free software download.



A new direction

Nigel Whitfield explains how to perform a useful trick to make your web site easier for visitors to navigate. It's easier than you think and has a host of other uses, too.

When you're browsing the web, something you may have noticed is that when you type in a URL, the address which finally appears in your browser's location box is different.

You might, for instance, type in `www.euro.apple.com/uk` only to find that you're redirected to `www.uk.euro.apple.com`. It's a useful trick and something that's often done when people redesign their sites. Large chunks of my own site now use a similar method to enable people to find pages that used to have static URLs but are now formatted on-the-fly by a database system.

There are other tricks you can use, too. How about a guest-book page where each person is given a unique URL of their own, so that they can add information or comments and revisit them? For instance,

filling in a form could create an entry that can be accessed via the URL `www.mysite.com/guests/nigel_whitfield`.

Counting heads

There's one other use for this type of job: counting the number of people who have clicked on a banner to jump to another site. Rather than linking directly to a site, link to the URL that will redirect to that site and you'll have an easy way of knowing how many people have used your link, which is invaluable if you want to persuade people to pay for advertisements.

You might think that this is a tricky task, but it's easily done. All you have to do is set up an appropriate redirection. Then, accessing a URL results in the browser sending back a header that says, for

instance, Location: `http://www.uk.euro.apple.com`.

You can arrange for the web server to send back the location header itself, or you could create it from a script, or even arrange for a URL to be redirected into a script. For instance, in our guest-book example, you might want to redirect any URL in the `/guests/` section to a guestbook script. If the script is called `guestbook.cgi`, then the rule might look something like this:

```
Redirect www.mysite.com/guests/*
http://www.mysite.com/guestbook.
cgi/*
```

If you have access to your web server's configuration file, that line will redirect the fake URLs that each user has been given, to the script. All your script needs to do next is to look at the `PATH_INFO` environment

variable, which is called \$ENV{'PATH_INFO'} in Perl, or \$PATH_INFO in a shell script, to work out which person's information is supposed to be displayed. That configuration rule, incidentally, should work for both the NCSA and CERN web servers and any that use the same configuration files, such as Apache.

Netscape notes

If you're using a Netscape server, go to the management pages, click on the Content Management button, then choose "URL forwarding" from the list of options and fill in the form to add a forward. For our example guestbook, you'd enter /guests/ in the first box, then www.mysite.com/guestbook.cgi/ in the "URL prefix" box.

Tales from the script

What about doing all this from a script? It's easy. All you have to do is create a script that outputs a Location: header;. You need no other information at all (like the Content-Type: information that would be used in a script which creates pages, for instance).

The most obvious use of something like this is for a script which counts the number of times a link to another site has been clicked. Your web server doesn't do this, and unless the recipient site logs where visits come from (and tells you) you have no way of finding out.

At its simplest, turning a link to another site into a request to run a script that simply redirects the browser is all you need: if the name of the destination site is included in

the call to the script, you'll see it appear in full in your server's log file.

For instance, you could link from your page to another in the normal way, with the URL www.theirsite.com/, or use HTML like this to run a script which performs the jump and ensures that an entry appears in your log file:

```
<a href="http://www.mysite.com/
jump.cgi/http://www.theirsite.com/
">Click here</a>
```

The script which processes this is very simple. In Perl, all you'd need to do is say

```
#!/usr/local/bin/perl
#
print "Location:
$ENV{'PATH_INFO'}\n\n" ;
exit ;
```

If you want, you can add more detailed information, including your own logging, which is useful if you want to track, say, what sort of browser people are using.

Essentially, redirections is a handy tool that you can use to make it much easier for people to find their way around your web site. Don't rely on everyone always wanting to go via the front page, though. Think what your site is used for, and how people might access it. Does it make sense, for instance, to allow for people putting /sales or /support on the end of your site name? If it does, redirect those URLs to the appropriate places so that people can reach them easily.

With redirections, your web server and your scripts have the power to make your site easier to navigate. Use it!

Questions & Answers

QI am creating HTML forms to send their input to Perl scripts. The problem I have is that the forms behave differently, depending on which browser is used.

The form in question has several text fields for input. Under Internet Explorer, if the user presses the Enter key, submit is activated whether all fields have been completed or not.

This is not the case under Netscape Navigator. While the user is not required to put text in every field, I do not want the form action to be executed until the user actually clicks on the submit button. Is there any way to do this without employing user-side code?

AThe simple answer is that there is no way around this problem. There's no mechanism in HTML to do what you want, which is validating a form. In fact, you'll find different actions on different forms, depending on the browser. For instance, NetScape will submit a form with a single field when you press Enter.

You should also be aware that checking for empty fields may be different, depending on what browser people have used. In some cases, especially where the POST method is used to submit a form, you'll find that an empty field may have a carriage return (character 13) in it, rather than being blank. As a result, it's important to have some validation code in your script if you want to be sure that the

Questions & Answers (cont'd)

information you receive really is complete. The alternative, as you suggest, would be to use client-side code to perform validation, but that will restrict the use of your form to people with the appropriate browser and platform, which is never a good idea.

Q I have recently upgraded my computer. On my old machine, when I connected to the internet it made various screeches and buzzing as the modem dialled, which was reassuring as I knew it was doing something. My new computer is silent when it connects. Although I have not yet had a connection difficulty, I would like to know how to enable the sound.

A The default setting for the modem is to turn off the speaker. All you need to do is change the settings to turn the speaker on until a connection is established (Fig 1).

In Windows 95, click on the Start button, choose Control Panels, then Modems. Find your modem in the list and click on Properties. You'll see a slider control that you can use to adjust the volume of the modem's speaker: move it to the right to enable the sound.

If your modem has been installed with the "Standard modem" driver, however, you may not be able to use the slider as it will be greyed out. If that is the case, click on the Connection tab, press the button marked Advanced, and in the Extra settings box, type M1 (Fig 2) which is the most common command to tell a modem to turn the speaker on when dialling and turn it off when a connection has been successfully established.

If you're not using Windows 95, find the part of your internet software that

sends commands to the modem and make sure the M1 command is included. If you see a reference to M0, that's turning the speaker off completely. The commands L0, L1 and L2 control the volume of the modem speaker.

Q How do I create animated GIFs without a special program? I would just like to input the HTML code. And how do I insert an object telling me how many people have visited the site since a certain date? I have seen this on other sites, but have no idea how to do it.

A The answer to your first question is simple: you *don't* create animated GIFs *without* a special program. Nevertheless, there is a way to achieve a comparable effect (which I covered in the April column) using Client-Pull: you can create a series of web pages, with sequential images, each one a little further on in the animation, and use the Refresh header to automatically load them all. Bear in mind that this will be slow and a waste of bandwidth. If you have a series of GIFs, download a program to turn them into a single animated one and upload it.

The only other option would be to use the Server Push system with a script that sequentially output the images in a single page. Again, this is a poor way of achieving a second-rate effect. With a true animated GIF, the whole file is

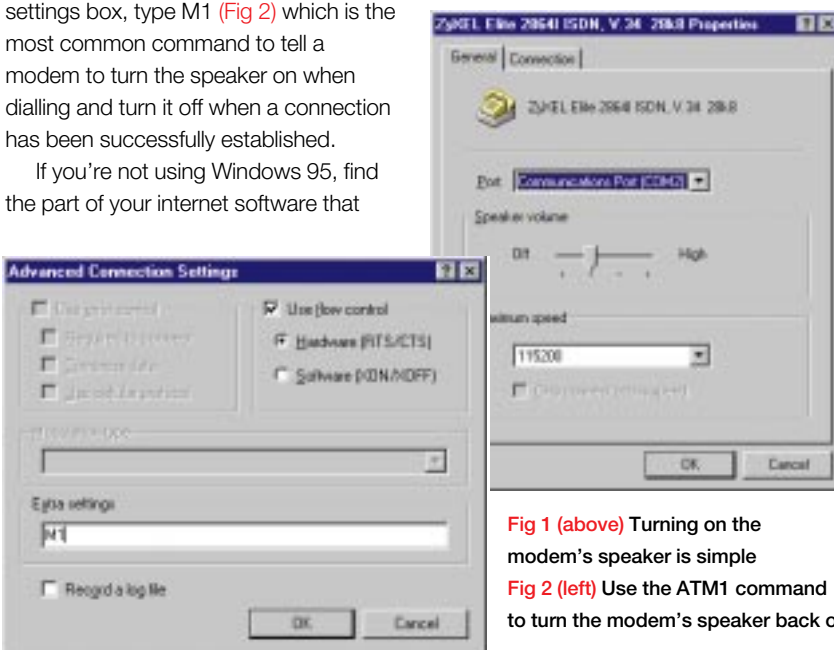


Fig 1 (above) Turning on the modem's speaker is simple
Fig 2 (left) Use the ATM1 command to turn the modem's speaker back on

Questions & Answers (cont'd)



Fig 4 Unlike some other web-based mail services, Lycos allows access using a standard POP mail program

A The first thing to do is to make sure that you have the latest version of Psion's MessageSuite software, which can be downloaded from its web site. However, the web

downloaded and then plays at the right speed. If you want to send each file separately, you'll receive very jerky results.

As for the second part of your question, inserting a counter on your web page is usually pretty simple, although the exact details depend on where your site is hosted. A counter is just a program that creates an image on-the-fly, keeping a record of the number of times it's been called and making an image based on that number. Typically, if the counter script is called "count", you would add it to your page with HTML as per Fig 3.

browser included in this software does not appear to support frames, which are used by many of the online mail services.

Thankfully, you need not worry about that. Although reading mail via the web is the usual way people access services such as LycosMail and HotMail, the Lycos system allows you to use standard mail-reading programs for an annual subscription fee of US\$23.95.

By doing this, you will be able to use the Psion's own mail program to retrieve your messages using the POP3 protocol (Fig 4), which should be far more

Fig 3: Adding a counter

```

```

Check out your web provider to find the name of their counter script and any options it allows. Some have a wide range of digits you can use. There are also some sites, such as www.digits.com, that provide free web counters and will tell you how you can add them to your pages, regardless of which server you're using.

Q I've been unsuccessfully trying to send and receive email with my Psion 5 organiser, using Psion's travel modem. My ISP is Microsoft Network and according to Psion tech support I can only access my email by using Microsoft's Internet Explorer (not possible on a Psion). I can surf the web OK otherwise. I also tried to use the free email service provided by Lycos, but while it's fine from my desktop PC, it won't accept input via the Psion. Is this all due to MSN? Would I have to sign up with someone else to be able to use email on my Psion?

straightforward than struggling with a web browser to read your messages. You can find more information in the Info section of the Lycos web site.

You can also access your MSN email using a POP3 mail program. To do that, you will need version 2.5 of the MSN software, since mailboxes were not accessible via POP3 prior to that version. You can request an upgrade CD by phoning 0345 002000.

Having upgraded your MSN account on your PC, you should then be able to configure the Psion's mail system to talk to the Microsoft Network POP and SMTP servers for receiving and sending mail respectively.

PCW Contact

You can write to Nigel Whitfield at PCW via the editorial office (address, p10) or email him at internet@pcw.co.uk.



Crazy little thing called DOS

When your CD-ROM drive won't restart in MS-DOS mode, how can you overcome the problem? Tim Nott comes up with a custom configuration to save you aggravation.

What started as a simple question from Peter Sewell ("Why doesn't my CD-ROM drive work when I restart in MS-DOS mode?") opened such a catering-sized can of worms that my first thought was to forget the whole thing and go fishing. But duty prevailed, and I have got the situation more or less under control.

Drive ways

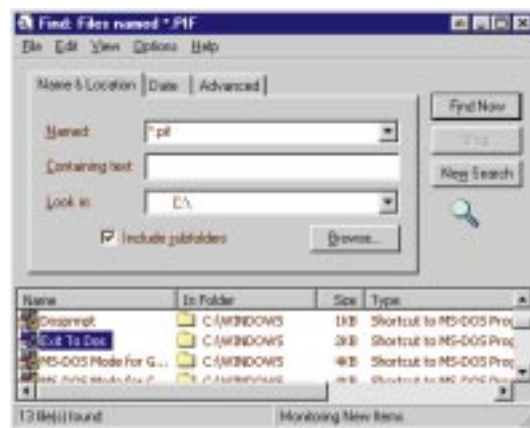
Under Windows 3.1, CD-ROM drives needed drivers loaded in the start-up files. For IDE drives (the most common) these usually consist of a device driver (.SYS) loaded in CONFIG.SYS, followed in AUTOEXEC.BAT by the MSCDEX.EXE program which "finds" the loaded driver and enables the operating system to access the CD-ROM drive.

Under Windows 95, for all but very old or proprietary-based drives, these Real Mode drivers aren't necessary as Windows detects the drives and automatically loads the required Protected Mode drivers.

The drive will also be accessible from an MS-DOS session running in Windows, even if that session is running full-screen. If you start a DOS window, hit Alt + Enter to make it full screen and type D:\ (substituting the appropriate letter) and you should be able to see what's on a CD-ROM with the DIR command. Typing EXIT will close the DOS session and return to Windows.

Please, no unloading

So far, so good. But if you shut down and choose the "Restart in MS-DOS mode" option, you'll probably find that attempting to access the drive letter produces an "Invalid drive specification" message. This is because Windows has unloaded itself from memory, taking the CD-ROM access with it.



First catch your PIF (Fig 1, left)...
...then dig in to those Advanced settings (Fig 2, below)

within will be processed when restarting in MS-DOS mode. This is fine for loading, say, a mouse or a sound-card driver, but as there is no corresponding file to process CONFIG.SYS stuff, it doesn't solve the CD-ROM problem. So this is what you do. Somewhere on your hard disk

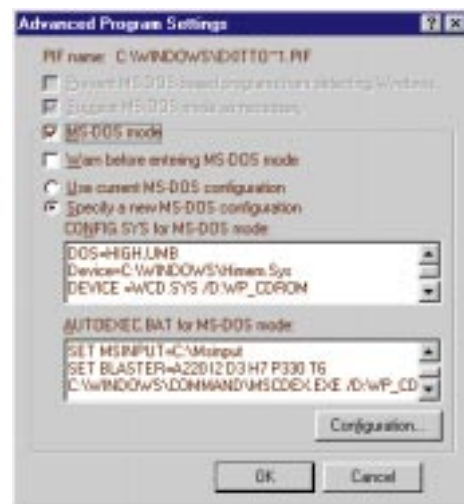
What you need now are those good-old real-mode drivers back.

Now, you may not even have an AUTOEXEC.BAT or CONFIG.SYS on your machine. Windows 95 doesn't need them, but usually on a default installation there are a handful of entries to set keyboard and screen country settings. It's

possible to add the relevant entries here, but although this leaves you well-equipped for MS-DOS mode, under Windows this will at best just waste low memory. At worst (as Peter found out) it could stop Windows being able to access the drives.

Start me up

You may or may not know that if you have a batch file called DOSSTART.BAT in your Windows folder, the commands contained



(mine's in C:\Windows) is a file named Exit to DOS.PIF. Although (and I've given up trying to get my head around this) the .PIF Extension doesn't appear irrespective of Options/View settings, a Find File for *.PIF will unearth it (Fig 1). If you haven't got one, then Shut

Down, Restart in MS-DOS mode, wait for the command prompt and type EXIT. Windows will restart and you'll find the file has been created.

First make a backup copy somewhere safe, then right-click on it and choose Properties. On the Program tab click on the Advanced button — exciting stuff, eh? You should see that the "MS-DOS mode" checkbox is ticked (Fig 2). The "Warn before..." box doesn't need to be ticked

Questions & Answers

Q I've been using QuickRes along with the other Powertools since it appeared. What I'd like to do, though, is change the screen resolution to a particular setting whenever someone logs in. This is because I prefer a higher resolution than the rest of the family (who each have their own logins) and it would save any moans if the screen resolution were set to each person's preference when they log in.

Ian Wall

A Sorry, Ian, you're out of luck. The display settings are stored in a part of the Registry that is common to all users.

Q How do I find out what is executed when I run a program? For instance, DLLs and other bits and pieces. My CompuServe buttons seem fuzzy but if I run an AVI file this cures it.

Nigel Deeley

A I have no idea what could be causing these symptoms (or their cure) but I can point you to some software that will do as you ask. See the item on Filemon in the panel below.

Q When you click on the Start Button a menu appears. On the left of the menu is a graphic stating "Windows 95". Do you know how to change this graphic?

Richard Lee

A I don't, Richard. As far as I know, it is built in to the innards of Windows. But you can get rid of it by right-clicking on the Task Bar, selecting "Properties" and ticking the "Show small icons..." box. This also gives a neater and easier-to-negotiate top level to the Start menu.

Q I use WinZip to create and unzip files. How can I label a Zip file with a description without changing the original name?

Stan Gaffney

A Good question. To the best of my knowledge the only product that lets you do this is Zip Magic <www.zipmagic.com>. But if you want to stay with WinZip, how about this workaround? Create a new folder, right-drag all the Zips to it and choose "Create shortcuts here". You can then rename each shortcut with a long, descriptive filename. Double-clicking on it will launch WinZip with the contents of the target Zip displayed.

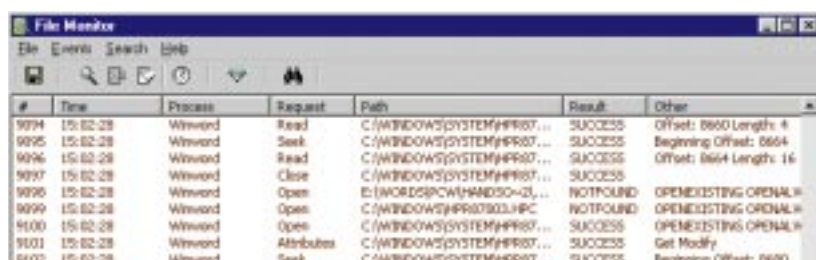
Q I usually have my icons arranged in a way that is convenient to find and access. The other day they seemed to have rearranged themselves and now I can't move them to where I want them. When I try, they just fly back to the left of the screen as if they were connected by elastic.

John Silver

What's going on? How Filemon can help

Wouldn't it be nice (see Nigel Deeley's query, above) to know exactly what files were being accessed and when. It might make diagnosing all those mysterious "Invalid Dynalink" calls easier. Help is at hand with the Filemon utility <www.sysinternals.com>. This monitors all reads and writes to and from every file on your system, with a scrolling list that shows various details.

It is quite astonishing how much activity is going on. Just clicking on the Start button produced 26 events and loading Word resulted in over 5,000 accesses. One good point is that you can filter what is and is not reported so you could, for example, ignore calls made to files in the TEMP folder or the MS Word spelling dictionary, and you can also search the results if you have a suspect in the frame. Filemon is free, as far as I know, and you can get it in both Windows 95 and NT flavours from www.sysinternals.com.



#	Time	Process	Request	Path	Result	Other
9094	15:02:28	Winword	Read	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	Offset: 0600 Length: 4
9095	15:02:28	Winword	Seek	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	Beginning Offset: 0664
9096	15:02:28	Winword	Read	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	Offset: 0664 Length: 16
9097	15:02:28	Winword	Close	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	
9098	15:02:28	Winword	Open	E:\WORD\PC\HANDSO~2\...	NOTFOUND	OPENEXISTING ORDINAL#
9099	15:02:28	Winword	Open	C:\WINDOWS\HFR87803\IPC	NOTFOUND	OPENEXISTING ORDINAL#
9100	15:02:28	Winword	Open	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	OPENEXISTING ORDINAL#
9101	15:02:28	Winword	Attributes	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	Get Modify
9102	15:02:28	Winword	Seek	C:\WINDOWS\SYSTEM\HFR87...	SUCCESS	Beginning Offset: 0600

Keep a finger on those file accesses

Questions & Answers (cont'd)

A Right-click on the desktop, Arrange Icons. At the bottom of the next menu you'll see Auto Arrange. Click on this to remove the tick beside it and your icons will stay where you put them.

Q I can't seem to remove anything via Win95 Add/Remove. I once got rid of lots of old uninst.exe files. TweakUI lists them but Control Panel won't remove them. Any solution?

Antony Stansfield

A This is almost certainly the result of deleting the uninst files. The TweakUI Add/Remove feature will remove the leftover entries in Control Panel's Add/Remove list. But that's all it does. It doesn't remove the program components themselves. Unless you are certain you've removed the program, any unshared DLLs and any Registry entries, the only practical

way to clean up completely is to reinstall the application to the same destination, then remove it again, either from Control Panel (as above) or from the program's Uninstall routine, if it has one.

Q In April last year you told us how to have just the drives displayed as icons when starting Explorer, by changing the shortcut target to read `c:\windows\explore.exe /n,/e,/select, C:\`. It has worked fine until recently but I now find that it is linked to `c:\windows\explorer.scf`. I have tried adding the suffixes but this doesn't work. I am running OSR2 with IE4.01.

Rob Marshall

A I think this is an active-bloodiedesktop thing. An .SCF file is an "Explorer command" and it runs Explorer the "old" way with C: expanded. The cure

seems to be to change the shortcut to point back to the original target.

Q I installed a copy of Eudora Lite and it opened a folder named Scripts. Some had interesting names so I tried to open one. I was thrown into the Open With command box and foolishly clicked OK while it was on the top entry "Acrobat Reader". Now, whenever I try to open one of these files I'm thrown into Acrobat Reader which will, of course, not read it. How I can break the link? The files in question have a .MOD extension.

Graham Keeley

A Open Explorer, or any folder. From the View menu, choose Options (or Folder Options), then File Types. Scroll down to the MOD file type, highlight it and hit the Remove button.



Fig 3 Turning off Autoplay

and below these are two option buttons. Select "Specify a new MS-DOS configuration" and you'll see two greyed-out panels spring into full, editable glory: one for CONFIG.SYS and another for AUTOEXEC.BAT. Here, you can edit away to your heart's content, adding the relevant commands to load the real-mode drivers and any other stuff you might want.

The actual command syntax will vary with the hardware (that shown in Fig 2 is for a Wearnes 12X CD-ROM drive) so you'll have to dig out the relevant commands from the manual or driver disk that came with the drive. The .SYS file itself must also be present on the hard disk at the target

location given in the new CONFIG.SYS. OK out through both levels, Shut Down, and Restart in MS-DOS mode again. Your PC will then restart to a command prompt and you'll be able to access the CD-ROM drive just as in a Windows-hosted DOS box.

One important thing to remember is that you shouldn't switch off the computer when using a custom configuration in this way, despite my reply to Alex Pounds last month, otherwise it will reboot back into MS-DOS mode. Type EXIT instead to return to Windows, then shut down normally. We'll look at this next month.

Land of the truly paranoid

Many people use a password-protected screensaver as the first line of defence from casual passers-by while they are out to lunch. But out to lunch is the operative phrase here, if they think this is going to stop anyone getting at their PC.

The simplest way for someone else to get around such "protection" is to switch off the PC or press the reset button. This has the additional unwanted "bonus" of losing any unsaved work, leaving temporary files around and possibly doing worse damage. Once the machine has been restarted, the intruder has the run of it.

If you'd like to get *really* paranoid, it gets better. Although a password-protected screensaver disables user input, there are other things it doesn't disable. One such is

the AutoPlay feature of CD-ROMs, so imagine the following scenario: you've run off to get the boss to come and look at your fabulous spreadsheet which will revolutionise working practices and result in your promotion. Wisely, you run your password-protected screensaver from a shortcut to the relevant SCR file. As you leave, a jealous colleague slips "Mandy's Incredibly Naughty AutoPlaying Slide Show" into your CD drive! *You have been warned.*

Destructive practices

On a more serious level, bear in mind that an AUTORUN.INF file on a CD-ROM could be made to run any program, including those destructive to the contents of your hard disk. Fortunately you can disable AutoPlay (Fig 3), as regular readers will know, from the property sheet of the CD drive in Device Manager, by deselecting the Autoinsert notification box.

This, of course, has the down side that you need to run CDs manually. It's hardly a gargantuan labour, but you can make it easier by making a Desktop shortcut to your CD-ROM drive — double-clicking will carry out the default (AutoPlay) action.

PCW Contact

Email Tim Nott at win95@pcw.co.uk or write to him c/o the PCW editorial office (address, p10).



Stop bugging me

Panicos Georghiades and Gabriel Jacobs set the record straight on the millennium bug hype (it's not actually a bug) and give advice on what to watch out for in your own system.

We could not help being amused by an advertisement for one of the many products now flooding the market, attempting to exploit the fear of uninformed computer users over the current hype surrounding the millennium bug. The advertisement reads: "Your PC is probably infected with the millennium bug. Even with a new PC and/or compliant software your PC hardware could today, or at any time in the run-up to 2000, suddenly start creating false information or even cease all functions thereby rendering all software and games inoperable. Don't rely on ambiguously worded guarantees. It pays to be cautious even if you are told your PC is compliant".

It goes on to describe the product being sold, which not only detects the so-called bug, but also "fixes" it. The millennium bug is not a virus or a germ you can kill. And it is definitely not catching, so you can happily let other people use your machine. The problem lies in the "genes" of certain computers, inherent in the design of the software and the hardware.

You can, if you wish, call it a short-sighted design method of storing dates, by using six digits (dd-mm-yy) instead of eight (dd-mm-yyyy) but this scheme was designed for good reason at the time. It was to save memory in the days when memory was hugely expensive.

International

Country: United Kingdom

Language: English (International)

Keyboard Layout: British

Measurement: Metric

List Separator: .

Date Format: 07/06/1998
Sun 07 June 1998

Currency Format: £1.22
-£1.22

Time Format: 21:40:25

Number Format: 1,234.22

International - Date Format

Short Date Format

Order: MDY DMY YMD

Separator: /

Day Leading Zero (07 vs. 7)

Month Leading Zero (02 vs. 2)

Century (1990 vs. 90)

Long Date Format

Order: MDY DMY YMD

Sun 05 March 1998

Fig 1 (above & left) To view the year as a four-digit number, you need to ensure the correct format setting in the Control Panel's International settings, by checking the Century box

If your PC (i.e. its BIOS, Basic Input/Output System) or any of your software or your data has this "fault", you will be affected only if the use of your system depends on calculations

to be made using dates. For instance, you may have programs that calculate someone's age by subtracting their date of

to be made using dates. For instance, you may have programs that calculate someone's age by subtracting their date of

Questions and Answers

Q Last year, you wrote an article about dual boot-up to enable the existence of Windows 95 and Windows 3.1 on the same hard disk, but running separately, with the option to choose which one to run at boot-up.

Following this I had no problems at all, except with the sound. (My sound card is a SoundBlaster). I found that if I loaded the drivers for it in Windows 3.1, I continually got interference in Windows 95. Launching programs, opening or closing files and sometimes saving files would be accompanied by a screeching, grating noise from my speakers.

My computer dealer spent hours trying to work around this problem: so many, in fact, that had he charged me by the hour I now need a second mortgage. He even changed sound cards but without success. In the end we compromised and I now have no sound in Windows 3.1. The sound seems OK in Windows 95, although I still occasionally get a grating/crackling noise when I launch Explorer.

Paul Freeman
pfreeman@provider.co.uk

A As we mentioned in our article on the subject, although you can have both systems on the same hard disk, you really need to treat them as separate entities, and not mix them at all. They can share data files such as pictures, documents, sounds and other files you have created and you can run some small programs under either system.

However, every other installation, large programs and hardware drivers, need to be specific to each system, including the installation of the sound card. In other words, your sound card needs to be installed twice, in two different directories: one for Windows 3.1, the other for Windows 95. If you have installed the Windows 95 versions of the SoundBlaster programs into the SB16 directory, which is generally used to hold the Windows 3.1 drivers, and have overwritten the Windows 3.1 programs, you will get problems. If not, then the problems you are getting are not because of the dual boot.

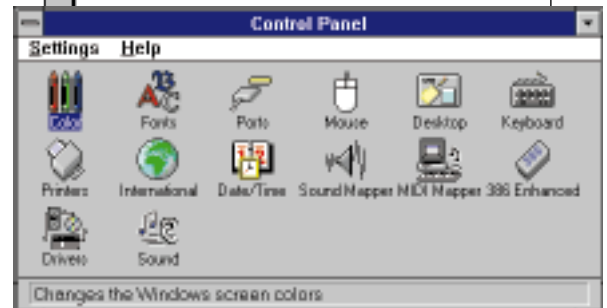
Do you get any problems if you start Windows 3.1 in standard mode by using Win /s? If not, then you have some kind of

```
C:\WIN31\WIN.INI
dalallowcustom=0

[Desktop]
Pattern={None}
Wallpaper={None}
GridGranularity=0
IconTitleFaceName=Arial
IconTitleSize=10
IconTitleStyle=1

[Extensions]
cal=calendar.exe ^.cal
crd=cardfile.exe ^.crd
trm=terminal.exe ^.trm
txt=notepad.exe ^.txt
ini=notepad.exe ^.ini
pcx=C:\PSP2\PSP.EXE ^.PCX
bmp=pbrush.exe ^.bmp
```

By adding three lines to the Win.ini, as in Fig 2 (left), you can change the default icon text titles font (Fig 3, below) ...



...to a larger, more readable, size (Fig 4, below)...



conflict in Windows 3.1 and you need to examine more closely what programs you have recently installed in Windows 3.1.

Q Can you tell me how I can change the font and size of the descriptions under the icons in Program Manager? I find them difficult to read.

John Balesford
 Manchester

A You need to modify the WIN.INI file in Notepad or Sysedit.exe under the [Desktop] section and then add the following three settings:

```
IconTitleFaceName=<FontName>
```

This specifies the font used to display icon titles, and the default setting is MS Sans Serif.

```
<FontName>
```

This is the name of the system font, not the font filename (for example, Arial, Courier).

```
IconTitleSize=<number>
```

The above line sets the size of the font used to display icon titles, and the default size is 8.

```
IconTitleStyle=<0 or 1>
```

This line specifies whether the icon title text should be in bold. The values are 1 for

bold, 0 for regular. The default value is 0.

Note that some fonts cannot be used, and that others can be used but will not display in bold. Some of these are the Wingdings font and the Vector fonts, Modern, Roman, and Script (Figs 2 to 6).



...or some other more interesting or crazy font (Figs 5 & 6, left & below)



birth from the present year. Or you may need to sort computer files by the date of their creation. If your use of the system depends on operations like these, you do need to be concerned to find out which parts of your machine are Year 2000 compliant. If not, then even if your system is not compliant it may be an inconvenience, but despite what some media would have you believe it will not be Doomsday — at least not on your desk.

In any case, it is worth setting the date of your PC forward and finding out how your machine and programs behave. This is just what one of our readers did, and discovered that file dates did not show as they should. Bill Neill (william.neill@altavista.net) wrote: *"I have been running my 486DX since the beginning of May with the clock set to May 2000. So far, I have only noticed one blip: when I save any file, the Date Saved in File Manager is saved as 18.5.19.0 instead of 18.5.2000. The applications I use are DOS 6.22, Windows for Workgroups 3.11, Excel 5 and Works 3.0. Any ideas?"*

Going into 2000

Bill's letter gave us the opportunity to check with Microsoft about which of its products are Year 2000 compliant. Here is what we have discovered, starting with DOS 6.22.

DOS will allow you to input a year date up to 2099, but Microsoft gives the operational range for data as up to the year 2035. DOS recognises dates beyond the Year 2000 and will sort files correctly but not display the full year. If you enter a two-digit date, DOS will assume that the date you entered is in the 20th century.

MS-DOS file system functions called by various programs use a year offset from 1980 to store dates. In other words, the year 1980 is the starting point (date = 0) and 1980 is added to them.

How do DOS commands behave?

- The DATE command — if you enter a date using a four-digit year (for example, 01-01-2000), this will be handled correctly. However, it does not correctly handle two-digit dates from 00 to 79 (the error message "Invalid Date" will be returned).
- The DIR command — it cannot display four-digit dates. The MSBACKUP command is the only DOS command that has serious Year 2000 problems (see *below*).

Windows 3.1 and WorkGroups 3.11

Windows 3.1 and 3.11 store dates as four-

digits, but suffer from all functions that depend on MS-DOS, as described above. One minor additional issue is that in the Control Panel (in the Date/Time applet) a small leap year problem occurs in that the date cannot be set to 02-29-2000 using the mouse. You need to use the keyboard to set the date on 02-29, 2000.

Note that to view the year as a four-digit number, you will need to ensure the correct format setting in the Control Panel's International settings ([Fig 1 on p229](#)).

MS-DOS backup

The DOS 6.22 MSBACKUP command does not recognise dates greater than 1999 and in naming conventions does not recognise the "tens" digit.

MSBACKUP creates a catalogue of the backups using a yy-mm-dd format. When a backup is made with the same number in the "ones" digit, and a different number in the "tens" digit (for instance, 1996 and 2006) the program treats them as having been made on the same date. So, they are numbered accordingly with a letter following the date to indicate that they are different.

For example, the following can be made to appear in DOS 6.22:

```
CC60829A.FUL (No Description) was
created on 8/29/1996
CC60829B.FUL (No Description) was
created on 8/29/2006
```

You can find the actual date of the backup by opening the .FUL file and scrolling to the last line. There, you will see it in mm-dd-yy format. MSBACKUP creates a date stamp on the backup files.

When you try to create a backup over an existing one, the program displays a warning to prevent you from destroying the file. The warning reads, something like: "You have inserted Backup diskette #2 from backup set CC60828B.FUL. This diskette was created using the DEFAULT set-up on 8-28-96. Do you want to overwrite this diskette or retry using another diskette?"

When the date on which the backup was made is greater than 1999, the date is improperly displayed. For example: "This diskette was created using the DEFAULT set-up on 8-29-CZ."

PCW Contacts

If you have any Windows 3.1-related queries or suggestions, contact Panicos Georghiades and Gabriel Jacobs at win3@pcw.co.uk.



Fix of the best

Andrew Ward has several fixes but also a warning: sort out your user profiles but beware of overdoing the hot fixes — they can mess up your system. Plus, there are some handy tips.

In the June issue, I wrote about reader Gordon Rogerson's query on user profiles and the fact that the following error message appears when attempting to use the System tool on the Control Panel to copy a user profile to a new user: "Copy Profile Error. The operation completed successfully."

Paul Fletcher has kindly written to point out a Knowledge-Base item on this problem, which appeared on Microsoft's web site long after I had written the original article. In fact, the problem only occurs where you have installed Internet Explorer 4. The article makes reference to a hot fix and says you need the versions of the files common.adm and userenv.dll dated 26th March, 1998. The problem should also be fixed in Service Pack 4.

According to Microsoft, things go wrong when the profile copy process tries to modify the security on the following registry key:

`HKEY_CURRENT_USER\Software\Microsoft\Protected Storage System Provider`

Instead of applying the Service Pack, there is a workaround, suggested by Microsoft, which involves stopping the



Fig 1 A workaround exists for the copying profiles bug

protected storage service before creating the template profile. Thus, a protected storage service registry key never gets created for the template profile, so won't cause a problem when the profile is copied.

1. Log on to your computer using a local user account with administrator rights.
2. Go to Control Panel/Services and then double-click Services.
3. Select the Protected Storage service, and then click Stop.
4. Create a new user account using the User Manager.
5. Log off.
6. Log on as the new user and configure the user profile as needed. This creates the user profile that you will copy to other

user accounts. *Make sure you use a new account that has not logged on to this computer before.*

7. Log off.
8. Log on to your computer using a local user account with administrator rights.
9. Go to Control Panel / System.
10. Click the User Profiles tab (Fig 1) copy the user profile, click OK and click OK again.
11. In Control Panel, double-click Services.
12. Click the Protected Storage service, and then click Start.

Deleting extinct shares

Thanks to everyone who responded to my plea for ways to remove extinct shares. There seem to be five different methods, apart from my own suggestion of directly editing the registry. Credit goes to the first reader to have replied for each method. Which you use is up to you!

1. Mark Goodspeed suggests what is perhaps the most obvious method: simply to recreate the directory, re-share it with the same name and then turn off sharing in the usual manner.

Of course, you will then have to delete the directory that you have created. Incidentally, it does not have to be the same directory, which means you do not need to create it at all. You can simply share your TEMP directory, for example, with the name of the extinct share, click Apply and then un-share it again.

2. Simon Cooper suggests using the File Manager. For those who are not aware, this is still included with Windows NT 4 (the executable is called WINFILE.EXE). To delete shares from within the File Manager, go to the Disk menu and select Stop Sharing. Find the extinct share in the list, and delete it (Fig 2).

In a fix

While on the subject of hot fixes, it's worth pointing out that a number of people have attempted to install them all willy-nilly and have ended up with unbootable systems, requiring a re-installation of Windows NT. This is probably due to a failure to install hot fixes in the correct order: some later hot fixes replace binaries of earlier versions.

However, it is best not to install hot fixes at all unless you absolutely need to. Microsoft does emphasise that hot fixes are not fully regression-tested and should only be applied where people are suffering the specific problem that they have been designed to fix. Service packs, on the other hand, although not without their problems, undergo rigorous testing, both in-house and by beta testers. In general, it's much better to wait for the service pack.

Tip — installing Outlook 98 on Exchange Server

When you install Microsoft Outlook 98, it attempts to determine which other applications and services are running that could interfere with a successful installation of Outlook. For example, other Office applications are a no-no, as is the Microsoft fax service.

However, as far as I can determine, installation of Outlook 98 on a system running Microsoft Exchange Server 5.5 will fail, but the setup program doesn't appear to be aware of this. So, if installing Microsoft Outlook on a server that's running Exchange, you'll have to go in and manually stop the services from running. That is, if you can install Microsoft Outlook 98 successfully at all. Out of three machines I've tried it on, two didn't work: Active Setup failed at the point where it is supposed to start downloading and installing files from the internet. Other users have reported this problem, too.

The only solution I've found (and it doesn't work for everybody, unfortunately) is to remove Internet Explorer 4 and then reinstall it from the internet first.

3. Ed Marchewicz points out that if you have NT Server rather than Workstation, you can run Server Manager for Domains (SRVRMGR.EXE), choose the appropriate host and then select Shared Directories from the Computer menu. Select the offending share and then Stop sharing.

4. The next method is perhaps the quickest, as long as you don't mind typing instead of using the mouse! The NET SHARE command can be used to list and delete shares (Fig 3).

The exact syntax is:
NET SHARE sharename
/DELETE

Thanks to Mark Lambourne for that one. Remember, you'll need quotes around the share name if it has spaces within it. Andy Atkins points out that the NET command also has many other uses. For example, in large domains, for writing batch files to create User Accounts, Home Directories and Shares with NTFS File Permissions.

5. Our fifth method, from Rick Mayell, is that if you have the NT Resource Kit installed, you can use the Net Watch tool.

A tip to save typing

While we're talking about driving Windows NT from the command prompt, here's a tip that could save you plenty of typing. Long directory names such as "Microsoft Monster Truck Madness 2 — Trial Version" are all very well but not much fun to type if you're moving around the folder structure from within a command window.

A little-known feature of Windows NT 4

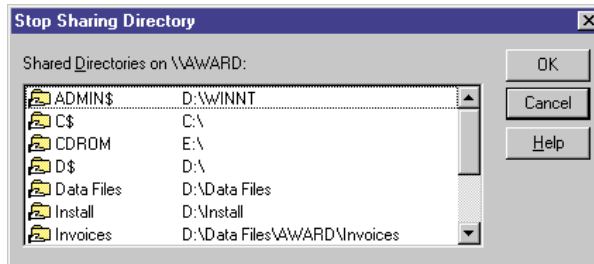


Fig 2 (above) The old File Manager still has some use in the GUI world of the Explorer

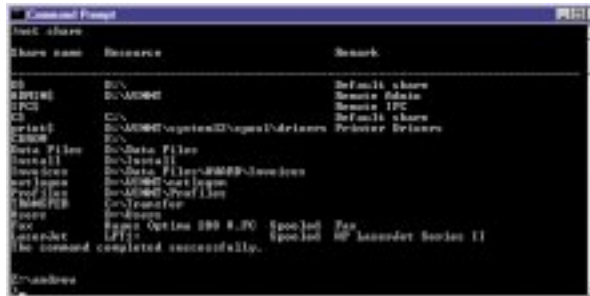


Fig 3 (above) Often the command-line is the most efficient way of accomplishing Windows NT administrative tasks

is a command-line completion character, which allows you to complete matching folder names at the press of a key (rather in the way that you can complete nicknames in mIRC 5.31 by pressing the TAB key).

So, with the completion character set to TAB, you could just type "cd mic" and then press the TAB key, for the previous example to be completed in full, thus:

```
>cd "Microsoft Monster Truck  
Madness 2 – Trial Version"
```

If there is more than one directory starting with the letters "mic", I have the option of either typing more characters, or repeatedly pressing the TAB key to cycle through them. This command-line completion character works in any folder, not just the root, so you can use it to navigate down through the levels. For example, I could type \g at the end of the following line (outside the closing double-quote), and then press TAB again, to get:

```
>cd "Microsoft Monster Truck
Madness 2 – Trial Version\Graphics
Files"
```

To enable command-line completion, you need to use the registry editor. The value in question is found at this key:

```
HKEY_CURRENT_USER\Software\Microsof
t\Command Processor
```

By default, CompletionChar is set to 0. Change it to the ASCII value of the character you want to use (for example, 9 for the TAB character).

In the mirror

Pierre Camilleri asks whether disk mirroring would slow things down much on a dedicated Windows NT Server automation system? Well, yes, it will (on disk writes, but reads will be faster), but whether or not the remaining performance will still be adequate depends entirely on the application.

Windows NT includes software RAID for three different levels: RAID 0, 1 and 5. RAID level 1, or a mirror set, is a set of two drives maintained as mirror images, either both on the same controller or on two separate ones. You'll get better fault tolerance and higher performance if you use two controllers. Note that both drives must be in the same format (FAT or NTFS). Mirroring does have an advantage over the other RAID levels in that Windows NT can boot from a mirror set, so it can be used for a server's system partition.

Although mirroring does provide some protection against hard drive failure, if any serious degree of fault tolerance and performance is essential, you'll be better off with a dedicated hardware RAID sub-system. You'll benefit from features like hot-pluggable drives (with the software RAID built into Windows NT, your mission-critical system could be out for hours while you replaced a failed disk) and higher performance. To set up a mirror set, run the Disk Administrator. Select the volume you want to mirror and then, while holding down the Ctrl key, select an area of free space on another drive that is as big, or bigger than, the volume you want to mirror. Then, go to Fault Tolerance/Establish Mirror, followed by Partition/Commit Changes.

At this stage, nothing much has happened. The content of the first volume has not yet been mirrored. Synchronisation will take place automatically to copy over the content when you next restart the system. To repair a mirror set you must first break the mirror so that the remaining drive

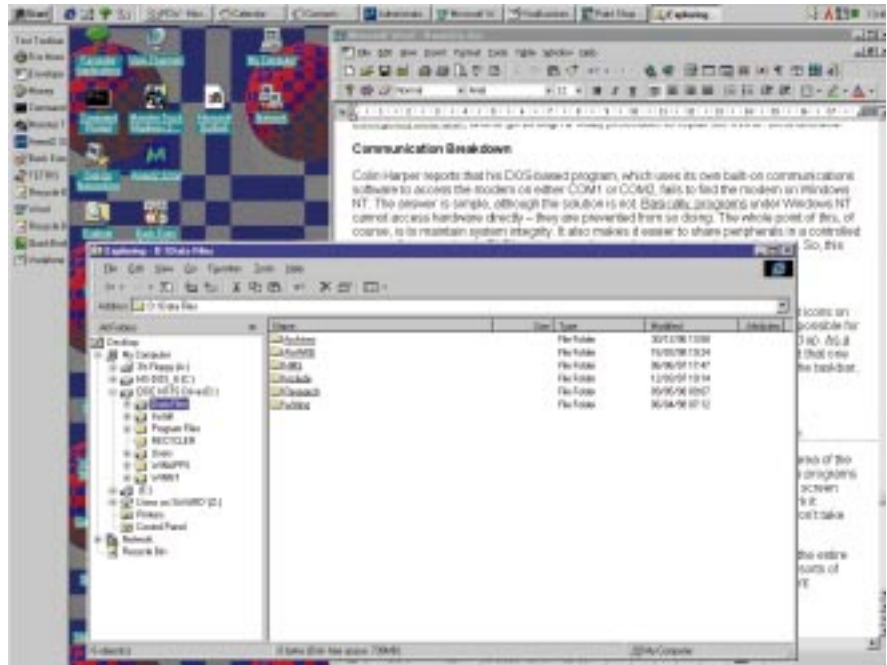


Fig 4 Overcome hidden icons by building your own taskbar

can work alone, and then establish a new mirror set with the replacement drive.

Although you can mirror a system partition, it creates a challenge. How do you boot the system when the primary volume has failed? The answer is to make a special emergency boot disk and go through a fiddly procedure to repair the mirror, which is best avoided!

Quick launch

One problem that has resulted from the new Windows NT 4 desktop metaphor is that the icons on your desktop are often hidden. Clearly, most people want to use as much screen as possible for the application they are working on, so desktop icons are usually going to be covered up. As a result, there are a number of tricks to overcome this problem. Robert Mauk points out that one of the easiest ways around the problem is to use the built-in Quick Launch portion of the taskbar and put items there instead of on your desktop.

Usually, you will find your Quick Launch directory somewhere like this:

```
D:\WINNT\Profiles\andrew\Applicatio
n Data\Microsoft\Internet Explorer
\Quick Launch
```

You can either place shortcuts there, or drag and drop them directly onto the Quick Launch area of the taskbar. Alternatively, you can make your own taskbar (Fig 4) and put your favourite programs there instead of on the desktop.

Communication breakdown

Reader Colin Harper reports that his DOS-based program, which uses its own built-on communications software to access the modem on either COM1 or COM2, fails to find the modem when it runs under Windows NT. The answer is simple, although the solution is not. Basically, programs under Windows NT cannot access hardware directly as they are prevented from doing so.

The point of this, of course, is to maintain system integrity. It also makes it easier to share peripherals in a controlled manner (for example, via TAPI), without interference from other running applications. So, this program will never work under Windows NT, unfortunately.

You can fit a lot more icons into the same amount of screen real-estate by using a taskbar (something like four times as many). You can then park it somewhere different like, for instance, down the left-hand side of the screen where it won't take up too much room (and/or set it to slide in and out).

PCW Contact

Andrew Ward can be contacted at NT@pcw.co.uk or write to him at the usual PCW address (p10).



Anything goes

Mark Whitehorn assures you that while this column caters for the most popular brands of PDA, other machines will get a look-in too. The art of taking screenshots is featured this month.

I said in the first column that this was a non-partisan palmtop column that would concentrate on the Psion range, Win CE machines and PalmPilots. As soon as the column hit the streets, several emails arrived asking if we could look at other machines, too.

An oldie but goodie

Andy Davis (alchemist@clara.net) asked about the Sinclair Z88. Despite the fact that it's no longer made, it is still sold and its usefulness is never-ending. There are new users all the time, amazed that the ten-year-old technology outperforms many of today's machines. In practice, the cheapest I have been able to find a new Z88 on the web is at <http://homepages.nildram.co.uk/~rakewell> where the basic machine costs £94 (incl VAT) with the recommended starter pack at £170. But Andy is quite right to say that reconditioned machines can be found for about £40.

It's a PsiWin-ner

Mike Newell (g1hgd@aol.com) favoured the Siena. He has just bought one off a mate who has upgraded to a Psion 5. It has all the PsiWin cables and software, is a 1Mb version and it was very cheap. He wants to know if there are more things he can do with it than he realises!

As a general reply to both Andy and Mike, I'm happy to publish tips and tricks for any PDA (within reason), so send them in.

Monster mash

John Goss (john.goss@dial.pipex.co) sent in such a monster list of tips and tricks that publishing it in full would instantly lead to cries of "Psion bias!" So, I'll cover some now and some in next month's column.

- Press **Ctrl-System** button to bring up a list of running applications.
- Press **FN-System** button to cycle through running applications. (*I find that this actually only cycles between the last two active applications — MW*).
- On programs with a toolbar on the side, pressing the area with the file/app name will bring up a list of applications running.
- On the list of applications running, highlighting a program and pressing **Ctrl-Shift-E** lets you kill the program. Useful if a program refuses to close.
- In **Agenda**, pressing space takes you to the current day.
- In **Calc**, pressing **Shift-Ctrl-I** brings up a list of keyboard shortcuts. (*Which includes the really useful information that you can use the I,O,U and Y keys for plus, minus, divide and multiply respectively. Until I discovered the shortcuts, I was religiously using FN-I, FN-O etc — MW*).
- If you have **PsiWin** for your PC, you can let your Psion choose from more fonts. Double-click on the connection monitor in your system tray, choose the Print Options tab and follow the instructions to install more fonts. Note that when you select one of your new fonts it will look like one of the default fonts. However, as long as you print via-PC, on a PC with that font, it will print with the selected font.

● **Warning.** Be aware that carrying out the following tip could damage your Psion.

You do so at your own risk:

If the stylus is jammed in the holder, it can be fixed by opening the RS-232 connector at the back of your Series 5 and pushing something flat (like a fingernail) into the crack below the writing "RS-232". The stylus will pop out and will work again. (*I tried it, and it worked fine — MW*).

● Pressing **Enter** when you have called up the extras bar, or tapping the part that says "Extras" on the extras bar, brings up a dialog letting you fix icons in position. But if you do this from the Control Panel, it is not saved when you are finished, so if you have to do a soft reset, you lose it all. The solution is to go into Control Panel, then extras, then OK out of the dialog and *voilà!* it is saved.

John Goss has a Psion 5 web site at <http://planets5.home.ml.org> and he recommended some others. I know that Steve Litchfield's was mentioned last month but I repeat it here because every Psion user should know about this site.

- **5 Alive** <http://5alive.pSIONking.com> Daily news and reports from the Psion 5 world .
- **3 Lib** <http://3lib.ukonline.co.uk> Run by Steve Litchfield. This is a huge site with a mine of information for the 3a, 3c, and 5.
- **PDA Online** <http://ady.net> A brilliant site with a huge amount of downloads and information .

Get a (battery) life

I have received several comments regarding my estimate of battery life for the Psion 5, all suggesting that it was way too pessimistic. This has me worried. On the one hand I refuse to tell porkies and pretend that my Psion 5 doesn't eat

Despatches

Remember the email from Shel Hulac, in Kazakhstan, in last month's column? (For those who missed it, a copy is on the cover CD-ROM as a text file: SHEL.TXT). The good news is that Psion has been in contact with him and has despatched a copy of PsiMail Internet on SSD.

batteries, because it does. On the other, many people report longer life.

I talked to the people at Psion, who were horrified at the figures I was quoting and immediately lent me another Psion 5. This one is still on its first set of batteries and is currently running at well over 15 hours. So, I take back all I said. In general, you can probably expect between 20 and 25 hours from a Psion 5.

However, I still get poor battery life from my own machine and I suspect that some people may share my problem. In fact, I now think there were two separate problems.

One is that Psion 5s from early in the production run may tend to be hard on batteries in general; this may just be a fact of life for these machines. Secondly, close observation has revealed that my original Psion 5 resets its battery monitor occasionally and throws away the old readings. So, my paper records show that I changed the batteries on, say, 23/5/98, but the Psion itself claims 2/6/98.

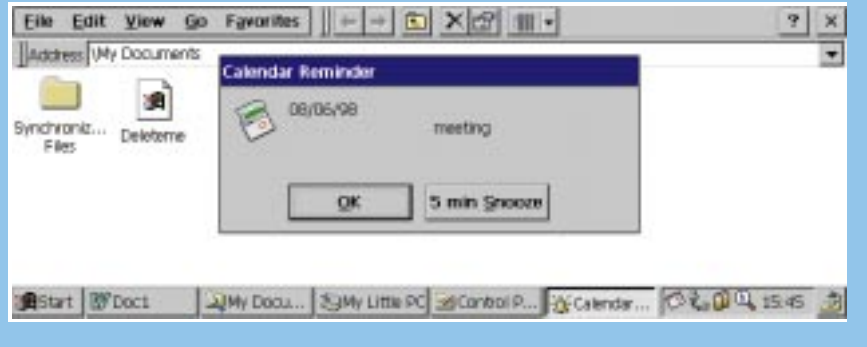
I assume this is due to an intermittent faulty battery connection. Whenever it fails briefly, the Psion assumes that a new set of batteries has been fitted. The result is an underestimate of the time for which the current set of batteries has been running.

Windows CE awaits your attention

No-one has yet sent in a list of tips and tricks for Windows CE machines, so I'll throw a few into the pot to get things going.

Snooze: always the best option

I lent the HP 620 to a friend to try. He thinks it's wonderful, particularly when it reminds him that he has a meeting. It offers the options of "OK" or "5-minute snooze". He feels that the latter is an excellent alternative.



- In Windows we are used to right-clicking objects such as folder, shortcut etc. The Windows CE equivalent is Alt-Tap, as in, holding down the Alt key and tapping the object on-screen. So, to view the properties of a folder or file, Alt-Tap it (Fig 1) and select properties (Fig 2). Or select the item and press Alt + Enter.
- To change the display properties, Alt-Tap on the desktop and choose Properties. You can maximise a window by clicking on its taskbar icon. I bet you knew that. But what I didn't know until recently is that you can also minimise a current window by clicking on its taskbar icon.

Windows CE currently only supports full-screen maximised windows. This makes it more difficult to move files around graphically, but you can use the taskbar icons to help. Open, say, a folder like My Documents, minimise it and open Windows Explorer. Then use Explorer to find the file you want to move. Select the file and slide it over the

taskbar icon of My Documents (Fig 3) whereupon that window will magically open and you can pop the file into

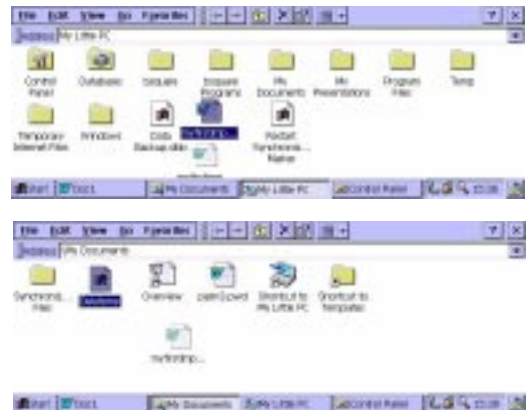


Fig 3 & Fig 4 (top and above) Moving files the graphical way in Windows CE

its new location (Fig 4). You can also select multiple files and move them all in this way.

To make a desktop shortcut, Alt + Tap the file, and choose Desktop Shortcut.

- Ctrl-Alt-Plus calibrates the touch-screen.
- Alt-Tab opens the task manager (Fig 5).
- Winkey-Space shows a list of key functions.
- Shift-Backspace deletes an item.

Our man in Paris

I recently attended the Windows CE Strategy day in Paris. The main thrust was that Windows CE is not just a cute interface; it is an operating system which can be used in other environments.

There are, of course, the new palm-sized machines running Windows CE which should be available by the time you read this. But in addition there is an auto-version coming soon, now.

Before you begin to get seriously worried, no-one is suggesting that Windows CE is put in charge of in-car computer systems like engine management, ABS and air bags

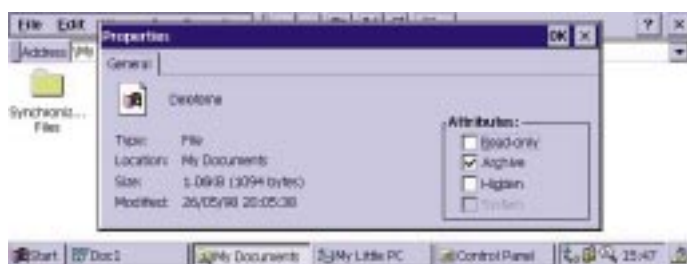
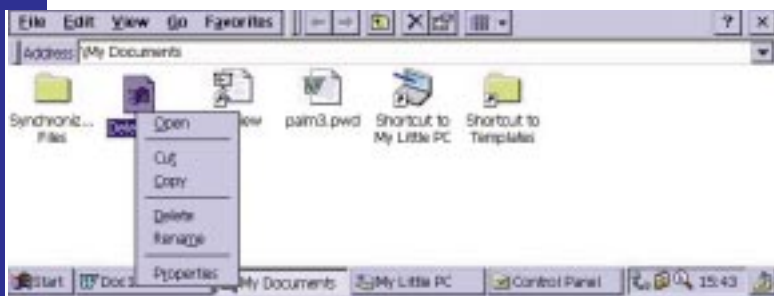


Fig 1 (top) Hold down the Alt key and tap an object... Fig 2 (above) Select Properties, and you can play with the properties of the object

Perplexed in Paris about a propeller-head

At the Windows CE Strategy day (see "Our man in Paris", p238) I was intrigued by "the conference gift". This was a ballpoint and propelling pen set with a twist: if you twist the cap clockwise, a ballpen emerges; twist it anti-clockwise and a fluorescent orange thing emerges. Sensitive people will tell you that it looks almost rude, but I wouldn't. So, what was it for? I naïvely tried to use it as a highlighter... nope, it didn't leave a mark. An eraser?... nope, it didn't erase. Then daylight dawned. Ah! Read the side of the pen: it says "Windows CE". The orange tip is a stylus for use on a touch-sensitive screen! Its colour property is set to "orange" to help remind you not to use the wrong end and mark the screen. Of course, the tip can be used on any machine with a touch-sensitive screen, not just CE machines.

Since then I seem to have seen these items (or ads for them) everywhere. Indeed, John Kennedy sent me some that he had obtained from a company called PDA Panache in the US. They are a mixed bag: some are cheap, tacky, orange-tip-only replacements for your current stylus. I can't see the attraction myself. Others, like "the conference gift", are dual-purpose devices which I favour: why would you want to carry more than one thinking stick?

The ever-friendly Widget Software <www.widget.co.uk> 01438 818818 has a dual-purpose one for £14.95.

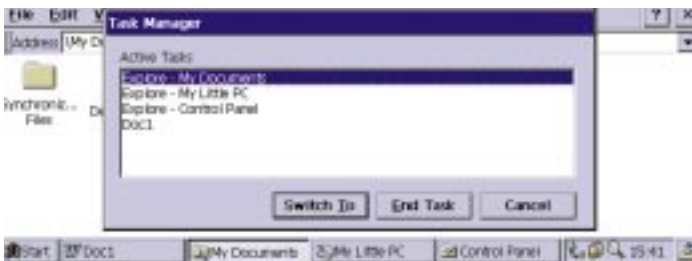


Fig 5 You can call up the Task Manager in Windows CE with Alt-Tab

(GPF... bang!). However, GPS navigation systems, in-car entertainment and traffic info from the radio are all non-mission-critical systems and Microsoft is keen that Windows CE will become the OS of choice for these. An in-car system was exhibited in beta in Paris and it did look good.

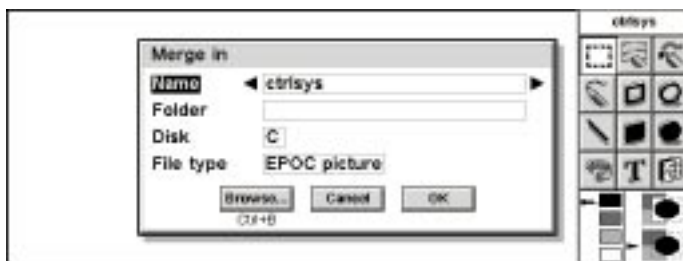


Fig 6 (top) Pressing the key combination Ctrl-Shift-Function-S on a Psion 5 will save the screen image in EPOC format...

Fig 7 (above) ...you can then merge this EPOC file into the Sketch application on the Psion and save it as a "normal" sketch file. This will be converted to a BMP by PsiWin when it is moved to a PC

Try this for size

More interestingly (if you are a database freak like me) was that NetSize, a French company, was demonstrating a

product called Active Gateway. It can be used in several ways and is essentially a message broker. It allows applications to communicate across a LAN with, for example, a back-end database like Oracle, Sybase or SQL Server.

In case you are now wondering what this information is doing in a palmtop column, consider this example.

Suppose your company wants to create

an application that runs on Windows CE machines on a LAN. The application has to work with data that is stored on a back-end database.

You don't want to set up ODBC drivers on all of the client machines, because you know it will be a pain.

If this describes you, then Active Gateway could be for you, so try visiting www.netsize.com.

p240 >

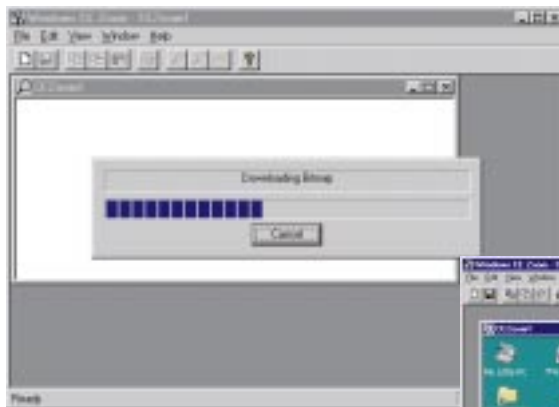


Fig 8 (left) Using CEZOOM to download a screen image from a Windows CE machine
Fig 9 (below) And here is the downloaded image, waiting to be saved as a bitmap



Hot shots

This column is sprinkled with screenshots from the main protagonists. In case you want to decorate your own documentation/web pages, this is how it's done.

- **Psion 3a/c** Set up the screen as required and press Ctrl-Shift-Psion-S (yes, that *is* four keys simultaneously!). The screen will be dumped as a file called SCREEN.PIC in the root directory. Rather annoyingly, if you repeat the process without renaming the file, the first screendump will be overwritten by the second. Jacques Gaudin wrote an excellent utility, way back in 1994, called COP ECRAN which stops this happening and automatically assigns numbered names to the screenshots (e.g. PENGUIN1.PIC, PENGUIN2.PIC, etc). It should be available at any good Psion web site. PsiWin can be used to move the PIC files to a PC and also to convert them to BMPs.

- **Palm** It is, according to the makers, impossible to do screendumps. The company itself has no utilities and knows of no third-party tool. Does anyone out there know differently, or want to write one?
- **WinCE** One way to get screenshots from a Windows CE machine is to use a utility called CEZOOM.EXE which comes with the CE developer's kit (Figs 8 & 9). Unlike the Psion, this utility runs on the PC, so the Windows CE machine has to be connected to a PC whenever you take a screenshot. As soon as you fire up CEZOOM it starts to download the current screen from the CE machine. This takes about a minute and then you can save the image as a BMP file.

A better way is to use a freeware



Fig 10 Capture CE dumps screenshots in an orderly fashion

application called Capture CE (Fig 10). I have not yet found it on the net but it can be downloaded from AOL by going to keyword PDA, then opening Software Library/Windows CE Libraries/Windows CE Utilities and downloading the file titled Capture CE. It

- **Psion 5** The key combination to use is Ctrl-Shift-Function-S. Instead of just dumping a file called SCREEN.PIC, a dialog opens up to allow you to "name that file" (Fig 6). Oddly, however, the screenshot is saved in "EPOC picture" format. PsiWin cannot convert this to a BMP file, so you have to do a little fiddling first.

runs with either SH3 or MIPS. This does run on the CE machine itself and, once fired up, it sits on the task bar. When tapped, it dumps screenshots in an orderly fashion. These can be transferred to the PC in the usual way.

Open up the Sketch application and from the menu select File, More, Merge in (Fig 7) and then choose the EPOC picture file you have just created. Save the file in Sketch format. PsiWin will then be able to convert this new file into a BMP when it is moved to a PC.

● All Palm tips and tricks gratefully received.

PCW Contact

Mark Whitehorn welcomes readers' correspondence and ideas for the Handhelds column. Contact him c/o the PCW editorial office (address, p10) or email him at pda@pcw.co.uk.



Hitting the **big** time

It's big and business-like and it's just landed on Chris Bidmead's desk — the Siemens-Nixdorf Primergy 560 server takes its place on his network. Plus, the NTrigue plot thickens.

The big event of the month for me has been the arrival of a Siemens-Nixdorf Primergy 560 server on my network. This is one of those big no-nonsense towers with serious business credentials: high availability, server management, error-correcting memory, hot-replaceable hard disks and hot-pluggable power-supply modules.

It's an Intel-based box, currently with a single Pentium Pro 200 but potentially expandable to four processors, and it comes with a choice of operating systems. NetWare 4.11 is one of them and SCO and UnixWare are two others. Eventually I intend to try all these, as well as Linux, as soon as Dandelion's Linux driver for the Mylex DAC960 PCI RAID controller is available

(from www.dandelion.com/Linux/DAC960.html). But my first installation is, er, Windows NT and as this is a Unix column I suppose I have some explaining to do.

Regular readers will know that the network I run is heterogeneous, and that one of the theses of this column is integrating Unix with everything else. I still have a couple of old NetWare 3.x servers which have been chugging away for the past eight years, and an NEC Powermate, which joined the team at the beginning of 1996, runs Windows NT 3.51. Or rather, a variant called NTrigue, developed by Insignia Solutions and based on core technology created by Citrix.

I've written a lot about NTrigue in past columns. The key feature is its ability to relay Windows across the network and have it pop up on any workstation running X. The Citrix stuff turns Windows NT into a multi-user OS, and the NTrigue refinements package this and handle the conversion to X. Either the whole NT desktop, or windows associated with individual applications, can thus mix and mingle with the Unix stuff I do on any of my workstations.

NTrigue has proved a clean and neat way of running Microsoft software on an essentially Unix-based installation, but there are a couple of problems. It still uses the old Windows 3.x style of desktop (NT, you'll remember, was only brought into line with Windows 95 in version 4.0). And, Insignia Solutions has washed its hands of NTrigue.

First, the good news...

The good news, so you might think, is that the NTrigue X refinements have been bought up by Citrix which, in turn, has sold its core multi-user technology to Microsoft to be incorporated into the next version of

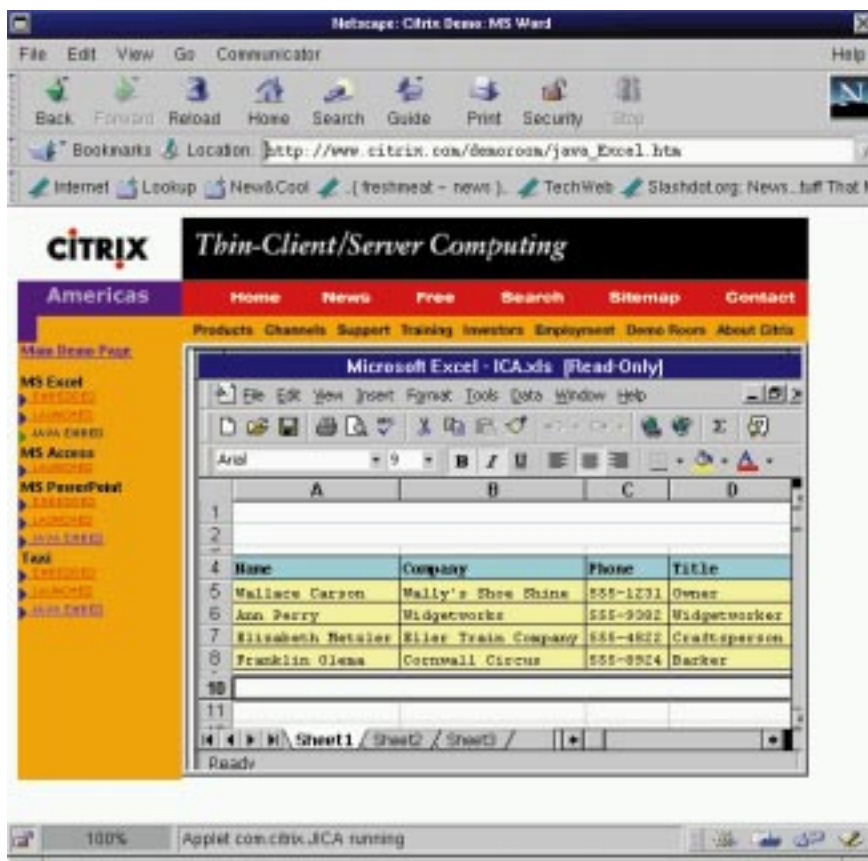


Fig 1 At least I have a Java-enabled browser. This is the Citrix web site, with a neat Java applet that turns your browser into an ICA viewer so that you can run Excel directly from the Web Client Demo Room. This is a full working version of Excel, although the window size is restricted. You'll also find Word and PowerPoint on the same site at www.citrix.com/demoroom

Community spirit: Linux sites and support

■ In the April column, Owen Kelly wrote in to say: "As a relative newcomer to Linux, I am finding it difficult to find my way around the operating system...", and asked for help with some of the basics. Now, Owen is making what he's learned accessible to other Linux users. You can check out his Beginners' Linux Guide on <http://members.xoom.com/cpx4>.

■ Steve Emms (goob@goober.demon.co.uk) is another happy Linux user who wants to give something back: "After using thousands of dollars-worth of tools/programs for nothing with Linux, I felt it was my duty to try to contribute to the Linux community in some way..." Steve has set up a handy Linux Links web site at www.linuxlinks.com. It makes a great jumping-off point for Linux info in general, and also includes some local content, like a review of the new Suse 5.2.

■ Jason Taylor (jason@kanda-systems.com) has been working with a project to build a professional Linux support site, along the same lines that software houses install to support their customers. According to the mission statement on the web site at <http://support.marko.net>: "Linux is the most exciting operating system development in this decade... Although few people question its raw power, many companies and individuals shy away from the system because of an apparent lack of 'commercial' quality support backing it up. Linux Support Services provides commercial-quality support in a cost-effective (i.e. free), timely, and reliable method in which anyone can participate, while contributing to the Linux community."

This two-way participation scheme means you can sign up as a customer if it's help you need, or as a technician if you want to be a dispenser of solutions. (One snag that occurs to me here is that it isn't quite that black and white: Linux users are a bit of each). At the time of writing, the site now has about 128 technicians and 325 registered customers. There seems to be some suggestion that the site intends to go commercial at some stage, and technicians have the eventual prospect of getting paid for what they do, but it's not clear how that will shake out. Founder Mark Spencer says: "Perhaps the most critical item that has made Linux the remarkable success it is, is its ability to innovate. When it looks blocked both left and right by seemingly immovable obstacles, it simply defines a new dimension with which to progress. In that sense, I hope to create a new dimension in which Linux will not only be 'supported' in the eyes of new users, but will also define a new standard for what support really means."

I would be grateful if readers who sign up, either as punters or pundits, keep me posted because I think we'd all like to keep an eye on this site.

Windows NT. An intermediate version for NT 4.0, initially dubbed Hydra but now called Windows Terminal Server, is already available as a beta. That is designed only to work with Windows Terminals.

A new Citrix package extends this to a limited range of client machines running proprietary client software. In theory, if you add the Insignia Solutions stuff that Citrix now owns, you're back to NTrigue-style functionality but on a base of NT 4.0.

The plan for the Siemens Nixdorf Primergy server is to install all of this and to put OpenNT into the mix, too, to create a super-hybrid Unix/NT machine that demonstrates the extent to which these two different operating systems can be integrated. OpenNT (www.opennt.com) is middleware that adds nearly 300 Unix and X11 commands and utilities to NT, effectively turning it into a Unix system. So the Primergy will become a best-of-both-worlds server and we'll see what advantages, if any, that brings to the party.

...then the bad

To date, I have the Primergy set up to dual boot between Windows NT 4.0 and Windows Terminal Server, with the Citrix

additions (initially called piCAsso, but now MetaFrame). The bad news is that the NTrigue component that does the conversion to X seems to have fallen by the wayside, and so the system will only work with Windows-based terminals, or with client machines running the special ICA (Independent Computing Architecture) software supplied by Citrix.

Let's get serious

This is a serious shortcoming. I'm interested in Windows terminals and in ICA, and want to set that up on my network. But being able to talk X is fundamental to the heterogeneity of NTrigue, and until I can get something similar running with Terminal Server, I see this as a huge backward step.

Citrix tells me that an add-on package called "Unix Integration Services" will be available at some stage and it sounds as if this might contain what I need. Meanwhile, the closest that Citrix can get to being truly cross-platform is a Java version of its ICA client (Fig 1). But this in turn relies on your having a working Java interpreter on your system and so opens a new can of worms.

I'm sceptical about Java and I'm not alone. Linus Torvalds has said that the



Fig 2 This is VNC, displaying the Primergy Windows NT screen on my IBM PC315, which is running Caldera OpenLinux. The display is a little more sluggish than a normal X window, but works well. The "Property Page" window can be used to control various features of the VNC server to optimise the display. The lower window behind is NTrigue, showing the earlier version of the Windows NT GUI

internal in-fighting over the past year has damaged Java to the point where "today, it's just gone". Let's hope he's wrong. But in the meantime, I'm not bothering with Java on my network.

Keeping it simple

If things go to plan I should at least have OpenNT running on the Primergy in time to report to you next month. Meanwhile, I have a simplified version of NTrigue-style computing running on that machine which is worth reporting on. It uses plain NT 4.0, not Terminal Server and dispenses with all the Citrix stuff. Although not multi-user, it lets me export the Windows desktop to other machines on the network. Each needs to be running special client software to do this, but the software is open source and is portable (Oh, and there's also a Java version, for the adventurous!).

VNC's copyright belongs to the Olivetti & Oracle Research Laboratory, but it's distributed under the GNU General Public Licence. You can get it from www.orl.co.uk, which is the best place to read all about it. It's a great way of sharing a screen between Windows (NT or 95) and Linux if you're running these on two different networked machines (see Fig 2).

Java jive

Reader Jed Cawthorne (gerard.cawthorne@virgin.net) writes: "You may like to take a look at www.xelfi.com. Xelfi is a graphical Java IDE which is written in Java and so runs on any system with a JVM. And the

last version 0.9.4 (?) is given away free. It's easy to install and is pretty nice to use."

An integrated development environment for Java that's actually written in Java sounds cool. My problem is that I haven't yet been able to get a convincing Java Virtual Machine running on my systems.

Yes, I know I'm horribly behind on this. Send me enough email telling me I need to get this done, pronto, and I will. Meanwhile, if any of you would care to check out Xelfi I'd be delighted to pass on your views.

Root and boot

"Tomsrtbt" is much neater than you'd guess from the unpronounceable name that programmer Tom Oehser (tom@toms.net) has devised for it.

This floppy-disk image is two things in one. It's valuable as a recovery/emergency diskette that powers you into a working mini-Linux if you need to fix your system but Tom also calls it "Learn Unix on a floppy". Boot any Intel-based machine with this and it will load a complete Linux system into a ramdisk, without needing to touch the hard disk or anything installed on it.

It's amazing what Tom has managed to cram onto a single diskette using a super format, that pushes the capacity of an ordinary floppy up to 1722Mb, and the new high-compression utility bzip2. It doesn't include X, but the essentials of a character-based Unix are there, including networking (with slip and ppp), the Linux and MSDOS file systems and many of the standard utilities like vi and awk. Linux fans can hand

these floppies out to friends to let them get a feel for Unix without risk of messing up whatever OS they already have installed.

The disk will accompany me on my next flight to the US. I'll be able to bone up on Unix with minimum wear on my battery because the wholly RAM-based installation doesn't waste juice powering the hard disk on and off. A cut-down version of Emacs is included and a full implementation of mount will let me save to the hard drive or floppy.

I gather that tomsrtbt stands for "Tom's Root and Boot" but I think something this good really deserves a better name. Drop me a line with your suggestions. It's available from www.clark.net/~toehser/rb and a copy is included in this month's PCW cover CD. Let me know what you think.

Millennium doom

Several of you have been having problems getting Linux to work with some of the advanced graphics cards, and the Millennium II seems to be a favourite here. I had a look through the documentation and discovered that the XFree86 group who are in charge of the free development of X seem rather fond of this card and a lot of work has recently gone into it, lead by the people at Suse. So, I thought it would be worth getting hold of a Millennium for myself.

It's installed in the IBM PC315, which now seems to be my lead workstation. The machine is mostly running Caldera OpenLinux and, yes, I did have some initial difficulty getting this to work with the Millennium. This is because earlier Linux distributions don't include the latest efforts from XFree86, and you need at least version XFree86-3.3.2 (www.suse.com) to get the best out of the Millennium II.

Next month we'll go into the specifics of how to set this up.

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Florida keys

At its annual shindig in Florida, IBM revealed its plans for OS/2, including "Aurora", the new Warp Server. Our man in the Sunshine State, Terence Green, brings you up to date.

At the annual IBM technical bash in Florida, in May, the plans for OS/2 going forward were revealed. First off, there are new updates to the systems management and backup/recovery software for Warp Server, which can be found on Software Choice at www.software.ibm.com/os2warp.

Early in 1999, IBM expects to ship the next release of Warp Server, codenamed Aurora, with a high-performance Journaling File System (JFS). Simply, a JFS has fault tolerance, as it keeps a record of changes enabling it to roll back to a known good state in the event of a foul-up. JFS fault tolerance for Warp Server will be complemented by server clustering support, an integrated web server and Java, Year 2000 and Euro currency support. It will have a new name in order to lose the poor image that unfairly dogs OS/2.

Whatever it's called, next year's release of Warp Server will go up against Windows NT 5.0 and NetWare 5.0 as IBM's Intel-based "middle-tier" server. IBM Aurora will support Java for the same reason as Novell NetWare 5.0. Middle-tier servers bond information systems together for electronic business: Java is the only true cross-platform glue in town and it's only going to get better.

Where do you want to go tomorrow?

People sometimes think that IBM's big investment in Windows NT servers means that OS/2 is dead and Java is a distraction, but Aurora says otherwise. As far as Java is concerned, Microsoft is aggressively Windows-only at present but it will eventually realise that cross-platform Java is an opportunity rather than a threat, just as it



did with the net. IBM's Windows NT servers address people's aspirations today. Aurora looks to where they want to go tomorrow.

Supply On-Demand

The other leg of IBM's Warp-based server strategy is WorkSpace On-Demand, the transitional thin-client server for legacy applications which also supports Java. At the end of this year, IBM will ship the next release with improved administration and support for a wider range of hardware. There may also be a hint of Citrix in the mixture to support those Win32 apps.

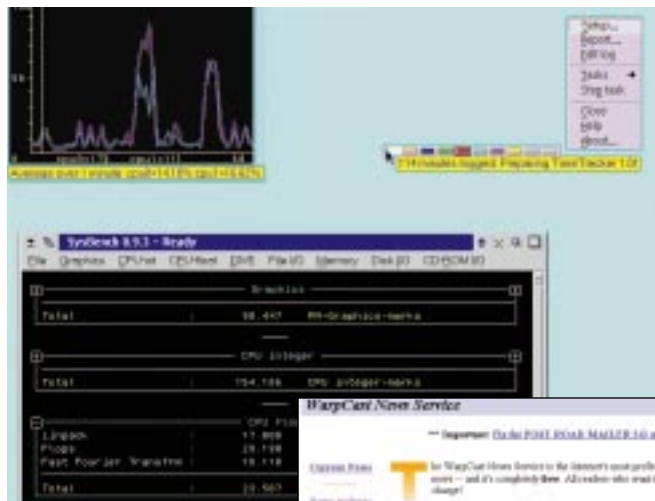
Not much was said in Florida about the Warp client but the situation remains as previously reported in this column. The future of Warp is in network computing with Java and that's going to keep the Warp client in the frame for a long time yet. WorkSpace On-Demand relies on Warp at the client end and it's inconceivable that IBM will ship Aurora in 1999 without a Warp client, purely because it has invested heavily

in the Java engine on Warp.

Another obvious sign of IBM's continuing support for the Warp client is the steady stream of updates and Fix Packs. OS/2 even features in future network clients from IBM. Core developers from the OS/2 team at Austin are now at work on the JavaOS for Business (a JavaOS optimised for Intel processors). The OS/2 client is being transformed into a network computing client but in such a way that no-one who uses it today should fear being cut off.

UK OS/2 user group

A number of UK OS/2 users are in the process of starting up an OS/2 user group. If you would like to be involved, please email Mike Kingsnorth at kingsno@ibm.net or have a look at the information site at www.denzil71.demon.co.uk/os2ug.html. You should also be able to find news of the UK OS/2 User Group at the WarpCast site www.warpcast.com.



Left (Fig 1) A selection of OS/2 Warp utilities: CPU Monitor, Sysbench, and Time Tracker
Below WarpCast OS/2 news on the hour

REXX in space

Despite having used OS/2 for years, I've managed to stay away from the REXX batch programming language. But people keep asking me when I'm going to do something on REXX, so I'm indebted to Brian Plester who has sent me a program he created to teach himself REXX. It's called SPACE.COM and you'll find it on our PCW cover CD in the HandsOn\OS2 sub-directory. The program catalogues disk space usage.

We also have three programs from Trevor Hemsley. If you've ever been into the OS/2 newsgroups (comp.os.os2.*) you'll recognise Trevor as a source of useful information on OS/2. Trevor wrote the following three programs: Sysbench 0.9.4c, an OS/2 benchmarking tool; CPU Monitor 1.11, which graphs CPU usage; and PM TimeTracker 1.10 which... well, you guess!

You can compare Sysbench results at <http://warped.cswnet.com/Sysbench> and if you follow the "Other apps" link at the bottom of that page there's some detail on the CPU Monitor and PM Time Tracker (also see Fig 1).

Applying Fix Packs

Some new users of OS/2 Warp have had difficulty with the Fix Pack instructions. Taking our August issue's Warp 3 PCW CD with Fix Pack #35 as the example, the files are stored in a special compressed disk format and named *.?dk where ? = 1 to J. These files need to be decompressed with DIUNPACK from FASTKICK.ZIP. You will need 50Mb free space plus another 10-15Mb or so for an archive directory, which needn't be on the same drive.



Open an OS/2 command window, create a temporary directory and, from the command line, copy XR_W035.?DK files from the CD to the temporary directory. Extract files from FASTKICK.ZIP to the same directory. Run DIUNPACK XR_W035.1DK to decompress the first compressed fileset.

Do the same for XR_W035.2DK to .XR_W035.JDK in turn. If you press the up arrow at the command prompt it will fill in the last command, and you can just back arrow and change the identifier from 1 to 2 though J rather than having to type the filename each time. When you finish, four sub-directories of the temporary directory will have been created. Now run FIX.COM (it was extracted from FASTKICK.ZIP) at the command prompt in the temporary sub-directory. A series of screens appears. One will ask for an archive directory. You'll need to enter a directory name here. Do read the README.1ST file for the details.

John Lewis wrote in to say that there's an even easier route. He used SimplyFix to install it direct from the CD. The version he used was SFix3.zip, a beta version he found on the OS/2 SuperSite.

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Language barrier

US English or UK English? Two keyboards separated by a common problem. Tim Nott presents the solution to making UK English the default language in Word 97. Plus, loose ends.

A hero's award, and a book token, to Bob Monroe who has at last laid to rest a thorny problem.

In June's column, I mentioned Veronica Waldorf's struggle to stop Word 97 using US English as the default proofing language. Bob had a similar problem but the suggested cure (checking that the Normal style and the Normal.dot template had UK English as the default language) didn't work for him. It turns out that the problem is documented in the Microsoft Knowledgebase, but is so deeply buried that it took some finding.

The missing ingredient is the keyboard driver (Fig 1). If your keyboard is set to the US layout, say, then all new documents will default to that language. Bob, who lives in Italy, has a US keyboard and driver.

The strange thing is, he notes: "If I type something, set the default as English UK, Save/Close it and re-open the file, the language remains UK." Stranger still: "If I delete the text, the language springs back to US." And strangest of all: "If I create a new document, set the language to English, then change keyboard driver, the document language changes to suit. As the document has not been edited; the change cannot be undone as there is nothing to undo!"

As far as I can tell, this doesn't appear to be a problem in Word 7 or 6 and it does have one positive aspect. If you use multiple keyboard layouts, as you can in Windows 95, with a little icon in the system tray to swap between them, Word will keep track in the document. Type using the UK English

layout, and the text will be marked for proofing in UK English. Switch to the French layout, and voilà! The text will be marked for proofing in French, assuming, of course, you have the necessary dictionaries as described in last month's column.

As for a cure, well that isn't so helpful, and the Knowledgebase article (Q163057) which should be found, on a good day, at <http://support.microsoft.com/support/kb/articles/q163/0/57.asp> offers a number of suggestions. The obvious is to change the keyboard driver but that can cause other problems, notably in Bob's case changing the hash key into a backslash. Suggestion two is to install Microsoft Word 97 Service Release 1. I did, and it didn't make any

difference. The third suggestion is to reset the language manually, which we already know about and is precisely the chore we are trying to avoid, and fourth is to select the affected text (or the whole document) and press Control + Spacebar. This, it seems, strips the language, which is applied as a character-level attribute, back to that defined in Normal.dot.

Hyperactive tip

Here's a tip we've had before but it was over a year ago so, in the public interest, here's a repeat. One of Word 97's helpful touches is to convert typed URLs (or network paths) into real, working hyperlinks. It's one of those ideas that is tremendously

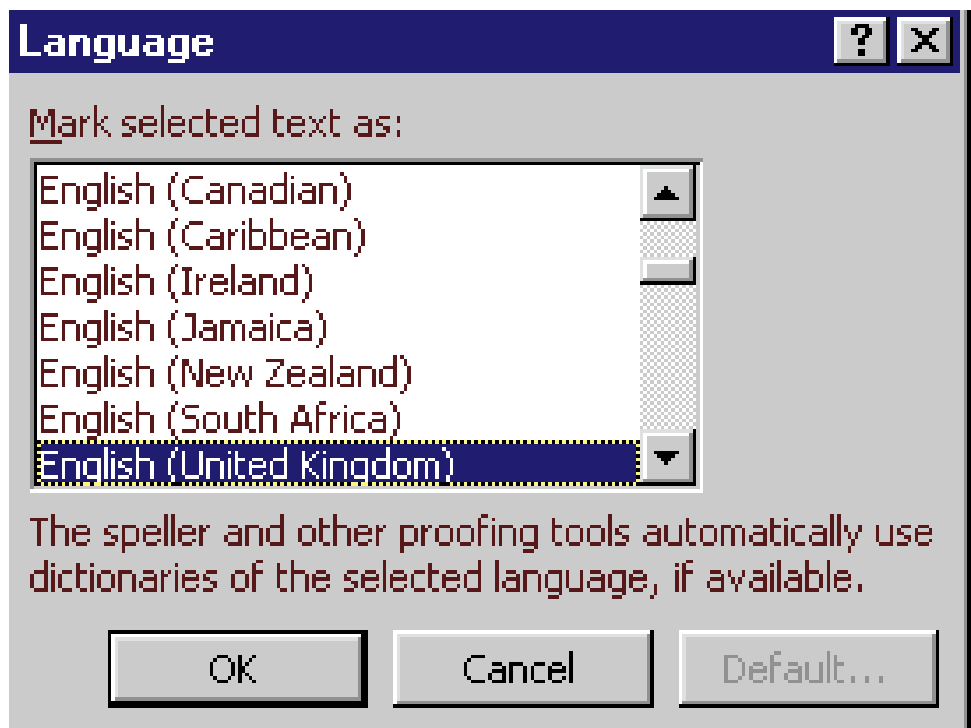


Fig 1 This setting is changed by the keyboard driver

Questions and Answers

Q How can I get Word 97 to shade different parts of a drawing object with different colours? I'm trying to get the segments of a hexagon in different colours.

Gerry Geoghan

A The easy way is to use a third-party drawing application. The problems with Word are that first, you can't split objects and second the Snap feature isn't very good. Nevertheless, it is possible to do this with a little trial and error (Fig 2).

1. First make sure Snaps are turned off from the Draw, Grid dialog.
2. Next, draw your hexagon from the AutoShape, Basic Shapes palette; holding down the Shift key will force a regular hexagon.
3. Use the Line tool to connect the opposite vertices and if you don't get them quite right, zoom in, right-click and use the Edit Points command to move the ends of the lines.
4. Use the pointer tool to select the hexagon and three lines by drawing an (invisible) box around them. Group the items together, from the Draw menu and apply the background fill colour.
5. Take the Freeform tool (AutoShapes, Lines) and draw triangles over the

segments you want coloured differently. Don't drag between the points, just click and you'll find that the segments are formed in straight lines and the triangle will automatically close when you click on the start point.

6. Apply the second fill to the new triangles (you may have to do some more tweaking with Edit Points).
7. Finally, Group everything together again and you'll be able to resize and move the entire graphic without it coming apart.

Q We have a mixed installation of Word 7 and 97 at work and have problems with the older installations not being able to read the newer files. Is there a way of standardising on the Word 7 document format throughout?

Deborah Rutherford

A Two solutions exist, both of which are free and easy to implement. First, there's a converter that will import Word 97 files into Word 6 or 7. It's on the Office 97 CD-ROM in the ValuPack folder as WRD97CNV.EXE.

Second, you can standardise on the earlier format globally, by going to Tools,



Fig 3 Backwards compatibility by default

Options, Save in Word 97 (Fig 3) and choosing "Word 6.0/95" from the "Save Word files as..." list. Make sure you have the Office Service Release 1 installed on the 97 machines, though, as otherwise they will save in RTF rather than true Word 6.0/95 format.

Q The Word File Open dialog box has an edit box at the bottom labelled "File Name" I use this with wild cards to find files that match (e.g. *.CSV, *.HTML). The next time you select Files Open, the drop-down list still contains the wild card masks. So far so good. While I was away from my machine someone used this option and typed the full names of several files into the File Name box. Now, whenever I click on the drop-down arrow I have a list containing the names of all the files they typed in, which puts the options I want at the bottom of the list. My question is do you know how to delete these file names from the list?

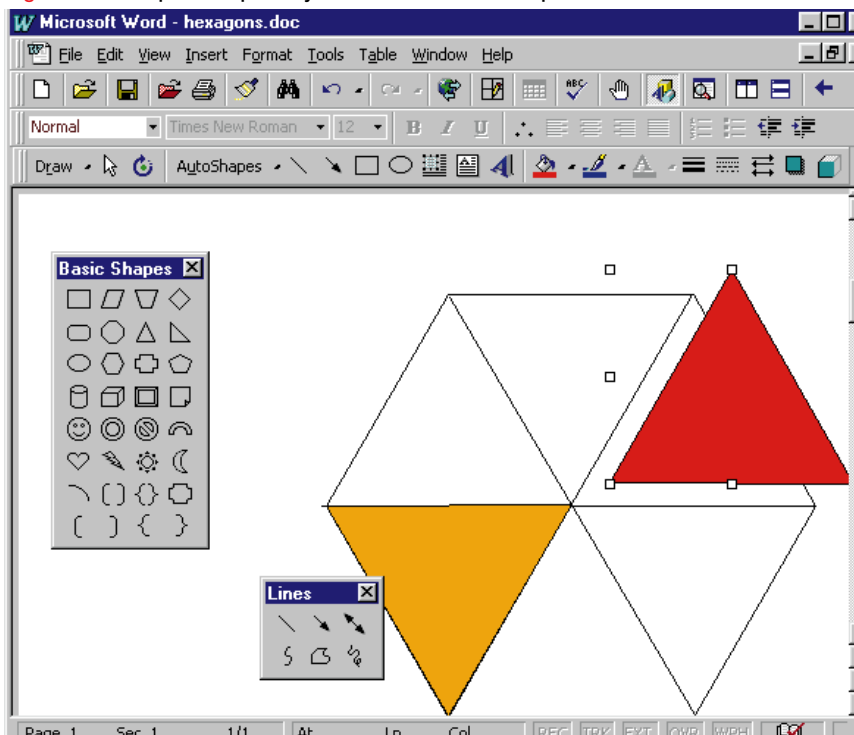
Terry Lee

A As far as I can tell, this is (as you surmise) a "Registry thing", as are all of Word's MRU (most recently used) lists. So, if you're feeling brave, close Word, back up the Registry (see *Hands On Windows 95*, Feb 98 on our CD), then run Regedit.exe.

Go to:

```
HKEY_CURRENT_USER\ Software\
Microsoft\ Office\ 8.0\ Common\
Open Find\ Microsoft Word\
Settings\ Open\ File Name MRU.
```

Fig 2 You can't split a shape but you can draw others on top



Questions and Answers (cont'd)

In the right-hand pane you will see a key named "Value". Delete this, close Regedit and restart Word. You'll find that the File Name box is now empty and you can re-create your favourite wild card masks. It is a fairly horrible business, I agree, and I am surprised that Microsoft has not provided an easier way of clearing this and all the other MRU lists. It should not, however, be beyond the realms of VBA, but don't ask me to write the macro!

Q I have Office 4.3 running on Windows 95, and the thesaurus doesn't work. Is there a way of fixing this without upgrading to Office 97?

Paul Cowen

A This is a "known problem" with non-US versions of Word 6 and Windows 95. There is a fix but it's hard to find. At the time of writing, it was available from ftp.microsoft.com. Click first on the Softlib folder, then on the Msfiles folder and you

should find WD1253.EXE — a self extracting file.

Q I am planning to buy a new PC and want to copy over all my existing WordPerfect 6.1 settings and preferences. Where are these kept?

Mick Heron

A Look in C:\WINDOWS (or wherever Windows lives) and you should find a file named WPCSET.BIF. That's the one.

impressive in theory but a pain in the neck in real life.

First, the slightest touch launches your dial-up internet connection. Second, if you make a mistake it's difficult to correct. Try to get into it with the mouse, and... whoops, there goes that dial-up connection again. Sneak in sideways with the cursor keys and you'll find you can edit the text but the underlying link stays the same: you need to right-click, Hyperlink, Edit. And of course, if you're producing documents destined to be printed, it's a total waste of time.

So here's how to turn it off. Go to Tools/AutoCorrect and in both the AutoFormat and AutoFormat as you type tabs, untick the "Internet and network paths..." option (Fig 4).

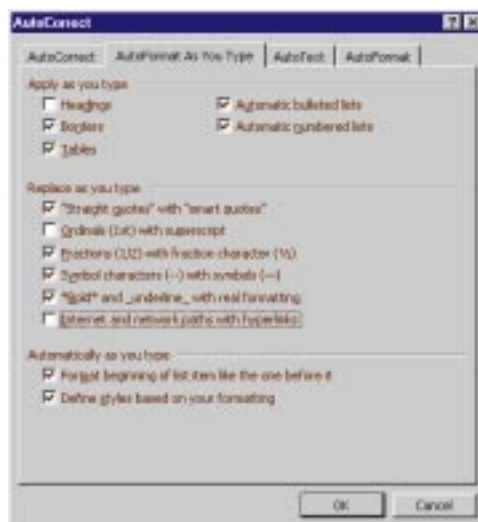


Fig 4 Stop Word automatically creating hyperlinks

Euro update

Yes, it's time once again for our old pal the single European currency symbol to take the stage. I have good news and bad news. Although, as reported before, modified core fonts have been available, they only work with Word 97 under Windows 95, or Windows 98 in general. Now, Windows 95 and NT 4.0 users can join the happy ranks of the Euro-enabled. Windows CE 2.1 will also support the Euro.

There are two patches available on the MS web site for each of the two operating systems and the documentation is a little confusing. But I downloaded the beta Windows 95 patch (W95_Euro.exe) from www.eu.microsoft.com/windows/euro.asp, copied it to the desktop of an original Windows 95 machine and ran it. It chuntered away doing various behind-the-scenes activities and, one restart later, I had

the Euro symbol available in each of Arial, Courier and Times New Roman in both WordPad and MS Works 4, which represent the limits of that machine's WP capabilities. Access is the same as in Windows 98 for a UK keyboard (Ctrl + Alt + 4). Or, you can find it in the Character Map (fourth row down on the left) or by typing ALT + 0128. Bad news for Windows 3.1 users. According to the Microsoft release: "Third-party solutions are now available to support the euro symbol." Seasoned MS spin-watchers will realise this translates as "Go fly a kite."

There is a further snag. You may find that the symbol appears on the screen but not in print. This is because the printer is using its own built-in fonts. The solution is either to send the character as a single bitmap (turn off the printer's built-in fonts, if possible) or obtain updated fonts from the printer manufacturer. At present, only Word 97 can do the first. The other two options depend on the make and model of printer.

Loose ends

■ No solution yet to Mark and Lynn Johnson's problem (see the July column) of Word Pro refusing to add words to the spelling checker user dictionary. However, I have got a little closer as to the reason why, largely thanks to my *Hands On* colleague Terence Green. Multiple copies of Word Pro can access a common user dictionary, so every time a word is added the file is temporarily made read-only to lock it against other applications writing to it simultaneously. If Word Pro were to crash, or the PC switched off without closing down Word Pro, then it would not be able to release the file. However, other correspondents state that this still happens with normal close-down and no crashes. The mystery continues...

■ Thanks, by the way, to David Kelsey, Terry Lee and others who offered solutions to Prof. John Butt's problem of getting footnotes to straddle multiple columns (see the June column). Unfortunately, nearly all the solutions involved the use of manually superscripted numbers and text boxes. So, no cigar, guys: these may look like footnotes but they do not walk like footnotes and certainly do not quack like footnotes. Real footnotes stay on the same page (or at the end of the same section) as their targets, automatically number themselves and in general stay organised. The challenge stands.

■ Thanks to Ian Kingston for pointing out that Adobe Illustrator is not the only program that will perform hanging punctuation (see April and June's columns). Ventura Publisher 7 does it as well.

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Map reading

Cartographic concerns are pinpointed this month as Stephen Wells tracks developments in mapping software. Gradients and dates are dealt with, as are cells, attachments and books.

Neil Wallace, of Lowestoft, says: "I have been unable to find Excel 97 data files for its mapping facility and wonder if you were eventually able to help Bill Bassett who asked about this in a recent Spreadsheets column." And so have others, Neil, so here's the latest.

Microsoft Map, supplied with Office 97, was developed by MapInfo and is a subset of its graphic analysis software products. You can buy additional maps, data sets and feature extensions from MapInfo (Fig 1).

Last year MapInfo bought out its UK distributor, The Data Consultancy, of Reading. This company, which has been supplying data of all types for 22 years, is now MapInfo's European distributor. Its 48-page catalogue of UK Data Sets offers a range of mapping input for professionals, including town centre plans, unitary authority boundaries down to the parish level, census information, postcodes, retail databases, demographics and newspaper readerships. There's even car ownership.

All this data can be supplied in a format

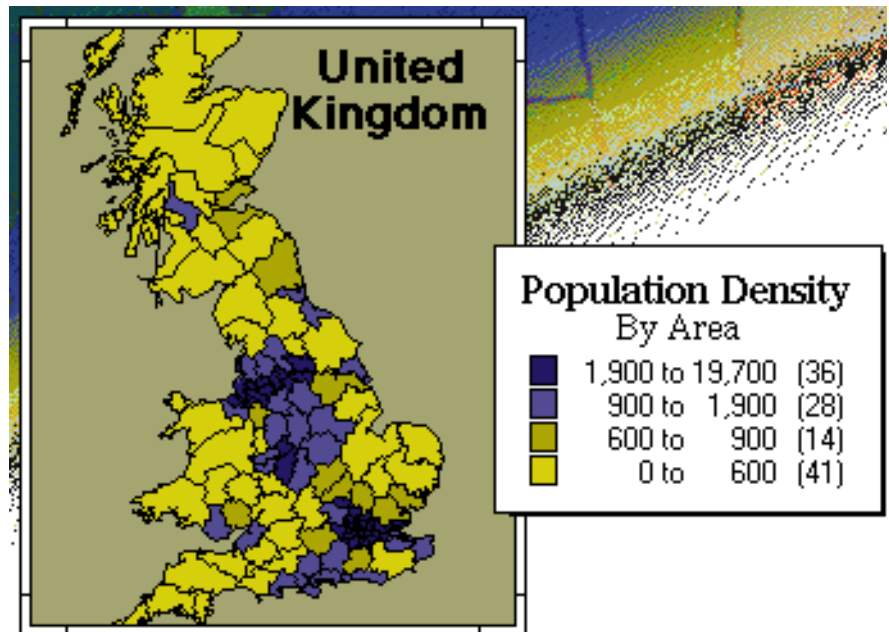


Fig 1 UK data files to load into Excel, and a more comprehensive version of its mapping software, are offered by MapInfo

which can be imported into Excel for database functions. But for better graphical output you would probably want to trade up

from Microsoft Map to the latest version 4.5, of either MapBasic (at £670) or MapInfo Professional (£1,095). Both prices exclude VAT and delivery and are for single-user licences. The product included with Office 97 is fine for the occasional user, but people who use GIS (Graphical Information Systems) in their everyday work can benefit from the extra investment.

Incidentally, Lotus 1-2-3 97 includes map-making software from ESRI (Environmental Systems Research Institute). 1-2-3 users can trade up to their latest product, through ESRI (UK) in Watford. ESRI also supplies ARC/INFO version 7.2, which runs under Windows NT and Unix.

From the man who can

Few can know more about cartographic matters in this country than the AA.

Book review: *Teach Yourself Excel 97 in 10 minutes*

Author Jennifer Fulton
Publisher SAMS
ISBN 067231326X
Price £10.99

Everything about this book is laudable except the title. It's a series of 27 lessons, each of which is estimated to take you ten minutes. So really we are talking about teaching yourself the basics of Excel in four and a half hours. But the price is right. At 224 pages, the size is compact. And with screenshots on virtually every page, it is very easy to follow.

The book covers all the basics of data entry, formatting, and working with ranges, worksheets and workbooks. The most-

frequently used Excel functions are described. The author explains how to sort, filter and group data for easy analysis; and obtain data from, or save it to, your internet web page or an intranet.

There are lots of good tips and shortcuts, and warnings about common mistakes. You'll see how to create your own toolbars and make hyperlinks to useful web pages, and there is an excellent description of the elements of a chart. If you've ever had questions about printing large worksheets, adding hyperlinks, enhancing charts, dragging and dropping — it's all here, in a neat little paperback you can use as a tutor by your PC or browse through on a plane or train.

Kingswood, of Brentford, can supply an AA Automaps for Excel 95 or 97 package for £89.99 (ex VAT and delivery). What you get are data sets: the UK map itself is drawn by Microsoft Map. But Excel only supplies county boundaries; AA Automaps displays the postcode areas, too, plus 400 place names, motorways, A-roads and other major roads. It lets you differentiate between postcode areas in colour or black-and-white shading. You can label the map with statistical information in exact locations. Once AA Automaps is installed, Excel automatically accesses the new map data instead of its default settings.

Several readers have asked about postcode information. Four times a year the Royal Mail updates the approximately 24 million UK addresses in the Post Office Address File. To simplify sorting, these are identified by some 1.7 million postcodes. The first two alphabetical characters (just one for each of the five largest cities) denote the AREA. The rest of the characters in the first half of the postcode describe a DISTRICT. The last section of the code starts with a single digit SECTOR. The final two letters are a group of houses, or a building. The Postcode GU23 6QB says the building identified as QB is in Sector 6 of District 23 of the Guildford Area.

As I say, you get the 124 UK Postcode Areas with AA Automaps. Kingswood also offers a GeoPlan Postcode District boundary data set for Excel. To go into greater detail than that you would need more sophisticated mapping software than Microsoft Map. Kingswood offers a wide range, right down to heavily-detailed street maps.

Making the grade

David Austin Turner at Brunel has written in to say: "I am at university, and I am required to create a lot of graphs for different things in relation to my engineering degree. Is it possible for Excel to give me the gradient of a straight line or curve?" Certainly, David. If you're interested in the theory, it is often referred to as the "slope" and traditionally written as m .

If you go back to the worksheet from which the chart was generated, you can find the slope of a line. Take two points on the line (x_1, y_1) and (x_2, y_2) . Then the slope is equal to $(y_2 - y_1)/(x_2 - x_1)$.

The value of y at the point where the line crosses the y -axis is called the y -intercept and often written as b . The equation for a

Questions & Answers

Q Can I make a hyperlink on a worksheet in my application to show a location?

A Yes, by postcode in some cities, or otherwise by Grid Reference. For the E3 2NN postcode you would enter in a cell

```
=HYPERLINK("http://www.streetmap.co.uk/streetmap.d11?postcode2map?e3+2nn", "Where we are")
```

The text portion will appear in the cell (Fig 2). To draw attention to the link you can format the cell after entry, without starting your browser, by right-clicking on it and choosing Format cells. The site is hosted by BTex Co.

Q How can I set a number of columns widths at once?

A Drag over the required column headings. Then either right-click and choose Column Width and fill in the box, or drag the right-most column heading border. To use AutoFit, which makes each individual column fit its own widest entry, double-click on the right-most heading border.

Q Can't I set all of a worksheet's column widths at once?

A Sure. Click the SelectAll button, then drag any one column to the required width. It doesn't look like a button, but

that's what Excel calls the little grey square left of the A Column heading and above the Row 1 heading.

Q What is the unit which the column widths are measured in?

A It's the average number of digits 0-9 of the default text font for the sheets. This is the font used in the Normal style. Choose Format, Style, Normal to see what it is.

Q How can I quickly jump to cell AE100?

A Type AE100 in the Name Box (to the left of the equals sign in the Formula Bar) and press Enter. Or press Ctrl+G and enter the cell reference. The advantage of the second method is that the cell address is retained in a list and you can select it quickly again.

Q How can I repeat a search?

Well, in order to start the search, you have to use Ctrl+F (letter F). Enter the value to search for. Then close the dialog box. Now press Shift+F4 (function key F4). The search is continued or repeated, continuously, even if you make other entries between searches. Don't press Ctrl+F4 by mistake or you'll close the file.

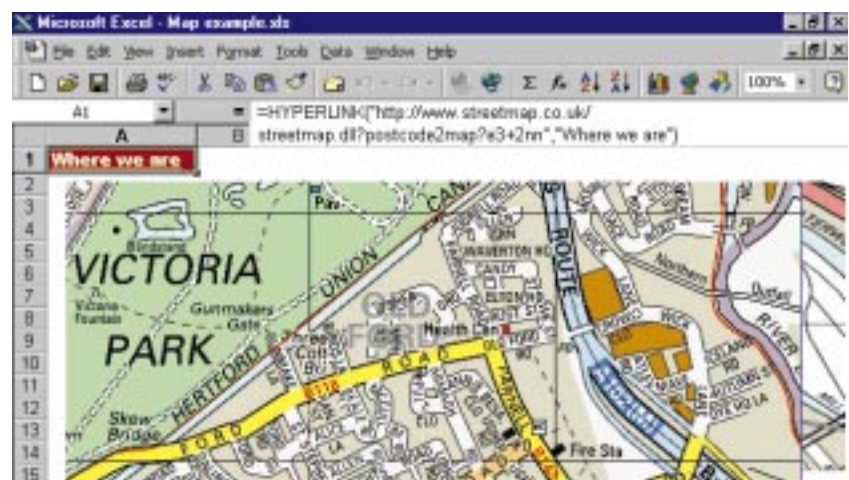


Fig 2 Thanks to BTex Co, you can offer a hyperlink on a worksheet to show your location by Postcode or Grid reference

straight line, where x represents the value on the x -axis, is $y = mx + b$. You can use the TREND function here.

When you have only one independent x -variable, you can calculate the slope with

the formula:

```
INDEX(LINEST(known y's, known x's), 1)
```

You can find the slope of a linear regression line with the SLOPE function.

Dates again

Dr Azuka Osakwe asks: "How do you stop Excel from changing your entries like 10-15 (age groupings) to Oct-15? I use age groupings as my x-axis in graphs."

Excel tries to guess the format you need and thinks that 10-15 or 10/15 looks like a date. Click on the column heading (A, B, C, or whatever) and choose Format, Cells and then choose what you want. You can use the Custom format to make Excel display practically anything. You might design a Custom format like ###-##. You would enter 1015 (without the hyphen) and Excel will put the hyphen in.

This format is a number, not text. If this were in A1, in another cell you could enter 1+A1 and it would read 10-16. In a chart, right-click on a label and change Properties.

Read all about it

Nick Jagers emails: "Could you tell me if it is possible to get code listings for the built-in functions of Excel 97, and if it is, how? I have been trying to find the mathematical

formula for the COMBIN function."

Click on the equals sign in the Formula Bar, Nick. This changes the Name Box to the Formula Palette which is a list of all the Excel functions. Click the down arrow and then select the COMBIN function and press F1. You'll see a comprehensive description of the function, including the formula you're after. You can, of course, similarly find all about any function this way.

Cell mate

A couple of readers have asked how to quickly display the value in the last cell of the current range on an Excel worksheet. Here's a small macro which will do this, using the Cells property.

Open the Visual Basic Editor by pressing Alt+F11. Choose Insert, Module and enter the procedure in Fig 3.

Save your work and close VBA. Back on your worksheet, press Alt+F8, choose LastCell, Options and pick a Shortcut key. This might be Ctrl+L.

To run the macro, select any cell in the

range, press Ctrl+L, and if all's well you should have the message as shown in Fig 4.

● This month's CD has this macro in a file called LastCell.xls. It can be opened in Excel 5 and above.

Fig 3 Last-cell macro

```
Sub LastCell()
    Dim rngRange As Range
    Dim theLastCell As Double
    Set rngRange = ActiveCell.CurrentRegion
    theLastCell = rngRange.Cells(rngRange.Cells.Count)
    MsgBox "The last cell in the current range reads " _
        & theLastCell
End Sub
```

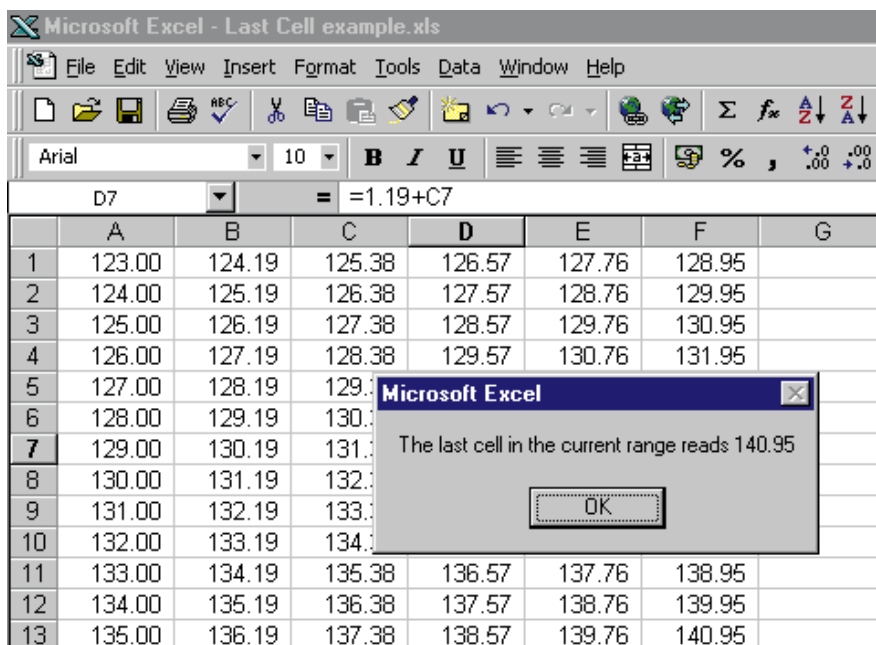


Fig 4 It's easy to create a macro which displays a message to tell you the value in the last cell of the current range

UK Map data supplied with Excel

In the directory C:\Program Files\Common Files\Microsoft Shared\Datamap\Data you should find the file MAPSTATS.XLS. Open this in Excel. Choose the World tab. Choose cell A4, then Window, Split. Scroll down to United Kingdom. Here is a lot of UK population data, broken down by sex, age, and rural versus urban.

Choose Window, Remove Split. Click the Name Box arrow, top left, and choose UK. This displays a list of counties. On a copy of the MAPSTATS file, or a new worksheet, you can add other columns of data to create your own custom maps. How to do it is all clearly explained in the Microsoft Map help file.

Tips

When using the MAPSTATS file, to display the Map toolbar, double-click on your map. To return to your normal Excel toolbars, click anywhere outside your map. To display the Map Control dialog box, click the button to the left of the zoom percentage box on the Map toolbar. To change the colour, or other formatting, of data in your map, double-click the appropriate column button within the Map Control dialog box. To see any county name, click the Map toolbar Map Labels button and hover the mouse over the county. To display any of the names permanently, double-click them. To deselect the Map Labels button, click the Select Objects button.

Be unattached

If there is one thing that is irritating when you pick up your email, it is to find that you are unwillingly connected for an endless length of time by a downloading message which has a large file attached. I use Outlook Express at the moment and have set the InBox Assistant so that messages with attachments are temporarily left on the server. So, if you must send an illustrative attachment, always send a brief warning message first.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him c/o the PCW editorial office (address, p10) or email spreadsheets@pcw.co.uk.
The Data Consultancy 0118 958 8181
www.mapinfo.com
Kingswood 0181 568 7000
www.kingswood.ltd.uk
ESRI(UK) 0192 3210450 www.esriuk.com
BTex Co streetfeedback@btex.co.uk



Shark practice

Just when you thought it was safe to dive back into the database column, Mark Whitehorn gets his teeth into a new problem. But you, too, can get hooked on querying from a form.

“ I am a student in South Africa reading for a PhD in Zoology. I am studying the morphology of shark-skin denticles to enable the identification of species from skin fragments (with a view to stopping the illegal shark finning industry). I have tried to build a form that could be used to enter the parameters, and then display the results of the parameter query. Could you help me out?

Dameon Wagner
zlbdaw@zoo.upe.ac.za

This is a good generic question. OK, so maybe the shark bit is a little weird but querying from a form will be useful to other readers in many far more tedious applications about orders and items and managers and stuff like that.

Shark-skin denticles have ridges and cusps. Given a skin fragment from an unknown shark, you can examine the denticles and count the bits. What Dameon wants to do is enter the numbers he finds on a fragment into a form and have the form display those shark species which have the matching numbers of ridges and cusps.

The form that does this is called Ridge and Cusp (Fig 1 on p257) and has two text boxes. You enter the numbers into the appropriate boxes and then press the button labelled Press Me Quick. The code behind the on-click event for this button is simple. To save you looking it up it reads:

```
Forms![Ridge And  
Cusp]![RC].Requery
```

This essentially says: “Go and requery the embedded subform within Ridge and Cusp, which happens to be called RC”.

The subform RC is based on a parameter query called R&C which draws data from the two text boxes on Ridge and Cusp. So, when you press the button, a query runs which pulls data from the text boxes and presents the results on the form.

Dameon’s sample database (complete with a working form, as requested) is on our cover-mounted CD-ROM as TRIAL3.MDB.

A date with friends

I really don’t know what it is about database people. Some of my best friends are database freaks and many of them can, on good days, hold perfectly sensible

conversations so that you really wouldn’t know there was anything wrong with them.

However, raise the subject of dates at a party full of database people and you’ll find that you’ve lost your kitchen, not only for the night but for the next six months. I really, really thought we had managed to draw the date discussion to a final conclusion, but then I received these three emails.

“I’ve just received the July issue of PCW in which you included my function for returning the tax year from a date. I’d missed the problem for 1999/00. I should have known by now to test anything involving dates against end of millennium dates. The

In years and months

“I have now figured out how to work out ages in years and months with some inspiration from having read your column. My solution uses two functions: one to work out the age, using your solution; the other, called monthage, works out the number of full months in the age. My function uses two dates; the date of birth and a now date from when I want to work out the age. Now check to see if it’s whole months.”

Adrian Porter Portercc@aol.com

```
Function agemonth (varBD, varNw As Variant)
    Dim varmnage As Variant
    'have they had a birthday?
        If varNw >= DateSerial(Year(varNw), Month(varBD), Day(varBD)) Then
            varmnage = Month(varNw) - Month(varBD)
        Else varmnage = 12 - Month(varBD) + Month(varNw)
        End If
    'now check to see if its whole months
        If Day(varBD) > Day(varNw) Then
            varmnage = varmnage - 1
        End If
    agemonth = varmnage
End Function
```

● I haven’t tried this function. Although I have every faith in Adrian’s coding, if anyone finds an error, please save it for the next database party to which you are invited. (MW)

Hands On Databases on CD

"I have been following your SQL Server tutorial in PCW [April-July issues] very closely and I have come across a problem. I have moved from London to Berlin and the removal company has lost all my copies of PCW. Is there any way I can get the tutorial online or a hardcopy posted to me? Your help would be appreciated."

Nitin.Parmar@ib.bhs.de

I get one or two requests like this every month and they always make me feel guilty. I would love to send the electronic copy of the column to anyone who asks, but the words I write become the property of VNU (the publishers of PCW) as soon as I write them, so I can't. However, our *Hands On* section is included in the archive CD-ROM which is produced every quarter. The CD-ROMs cost £9.95 and can be obtained by ringing 01795 414870 (or see our *Reader Offers* on page 286).

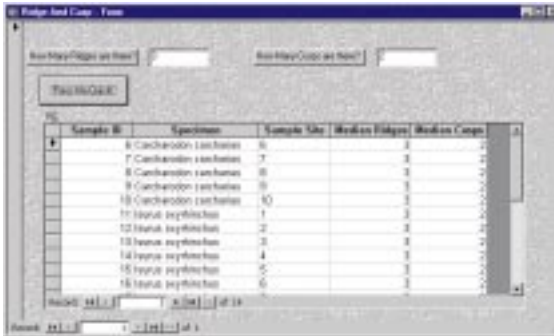


Fig 1 Enter information into the two text boxes and press the button to query the tables. Good numbers to try are 3, 2 and 5, 2

to force users to enter all four digits for the year. The input mask can be applied at either table (preferably) or form level and it forces the user to be explicit as to which year they

solution I'd go for would be to add an extra line immediately before the last one:

```
strEndYear = Right("0" &
strEndYear,2)
```

"This would also give 2000/01 which, I think, is probably the way it should be formatted rather than 2000/1 and so on."

Ken Sheridan

KenSheridan@compuserve.com

Bought the book...

"I have just received my copy of *Inside Relational Databases via the PCW Reader Offers page* (see p286 this month) and may I say what a good book it is, too. But on page 21 of the book you comment that Access users shouldn't have a problem come the Year 2000. I have to disagree with this quite strongly because despite Access' ability to store dates with a four-digit year, if a user enters a date with a two-digit year, it can be misinterpreted by Access."

Christopher Perry

christopher.perry@bae.co.uk

This depends to some extent on the version of Access used: v2.0 will always interpret two-digit year entry as 19##; later versions use a default windowing technique to establish what the input is meant to be.

The only sure-fire way to ensure that Access stores a date with its intended year is to apply an input mask in the form

```
99/99/0000; ;_
```

mean when they are entering dates.

OK, perhaps "shouldn't have a problem as long as they understand how their particular version of Access interprets dates" would have been more accurate. I agree wholeheartedly that you have to know exactly *how* your version of Access is going to handle dates but since there are a variety of strategies available, this is true for any package. The point I was trying to make was that Access *does* understand about four-digit dates, which other PC-type packages don't. In addition, any one particular version of Access handles the year 2000 consistently. Nevertheless, I support your suggestion that people should

Putting data on the web

"My site (www.hipstream.force9.co.uk) contains my final-year dissertation related to the interconnectivity of database and internet technologies (i.e. how to write an interface for any database to enable it to be accessed over the web/intranet). I have published it as an easy-to-follow tutorial with good examples of the following topics: HTML / CGI / ISAPI / ODBC32 and ActiveX."

Kevin Staunton-Lambert

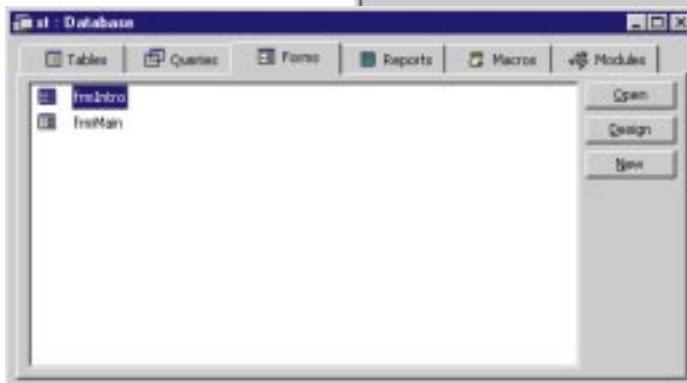
Kevin@hipstream.force9.co.uk

● I've had a look at the site and it seems well worth visiting if you are interested in publishing data to the web.



Fig 2 (left) Ken's MDB file shows this "startup" screen when it is opened. If you simply choose Close, then this form (**Fig 3, below**) opens up so the next time the MDB file is open the startup screen is again displayed. If you uncheck the box shown in **Fig 2**, that screen is not shown again...

Fig 4 (below) ...However, if you go to the database window and open the form called frmintro, the checkbox resets itself (and looks just like **Fig 2** again) and once more appears on startup



In a slightly similar vein, I needed to include in an application one of those intro forms which has a checkbox captioned something along the lines of: "Always

use an input mask in order to force users to enter four-digit dates.

A bigger splash

"I recently answered a posting by a rather puzzled Access user who couldn't understand why one of his bitmap images came up in place of the usual Access splash screen when he opened a particular database. In fact, he'd accidentally discovered a useful trick for substituting your own splash screen for the Access default image, which is simply to include a .bmp file in the same folder as the .mdb file and give them both the same name. To suppress the splash screen completely, just use a single-pixel bitmap image."

Ken Sheridan

KenSheridan@compuserve.com

This is really clever. I've just tried it, and it works! Do bear in mind though, that this won't work if you open the MDB file from within Access. You have to open it by, say, double clicking the MDB filename in Explorer.

show this form on opening". After a bit of digging around in the Help system I came across a useful general-purpose function for changing database properties, which does the job. By setting the intro form as the Startup form from the Tools\Startup menu (and including code to call the function and so change the Startup Form property in the form's Close event if the checkbox is unchecked), another form opens next time the database is opened (**Figs 2 & 3**). To enable users to reset it you could always add an item to a custom menu to open the form and check the box.

The same function can be used to change other properties, such as setting the application icon. This is useful if the database is moved to another machine where the the path to the icon file may be different, or just to enable users to choose their own icon without giving them access to the Startup sub-menu.

I've attached a demo .mdb file (v.7) on our PCW CD (as ST.MDB) with a couple of forms and a module containing the function.

Fig 5 — General purpose function for changing database properties

```

Dim dbs As DATABASE, prp As Property
Const conPropNotFoundError = 3270
Set dbs = CurrentDb
On Error GoTo Change_Err
dbs.Properties(strPropName) = varPropValue
ChangeProperty = True
Change_Exit:
Exit Function
Change_Err:
If Err = conPropNotFoundError Then 'property not found
Set prp = dbs.CreateProperty(strPropName, _
varPropType, varPropValue)
dbs.Properties.Append prp
Resume Next
Else
'unkown error
ChangeProperty = False
Resume Change_Exit
End If
End Function

```

For those without Version 7, who want to study the code, it is shown in [Fig 5](#).

DRI comment

I've split this letter up but each part is from Richard.WHITFIELD@sb.com.

"Regarding client servers, what is DRI (I can guess from the name but need some idea of its capabilities)? Is it equivalent to using key constraints?" — Is DRI (Declarative Referential Integrity) like key constraints? Yes and no (he wrote tactfully) but more no than yes. If you think of DRI as being like the referential integrity that can be set in Access, you have a good mental picture.

"Which is better for enforcing table relationships, DRI or Triggers?" — This is a complex area and my quick opinion is that you should use DRI rather than triggers. But (and it is a big but) DRI in SQL Server version 6.5 cannot cope with cascade delete/update. So if you use those in your database then use triggers since these can cope with cascades.

"Is DRI more efficient than using triggers?" — Supposedly, and certainly DRI is a better way of "documenting" the database.

Special functions

"I've been writing an application using VB and I needed to create some special functions that would help me manipulate strings. The functions should work in VB5.0 and Access 97. I've included the following:

FindReplace. This will basically do the same as the find replace function that is in the edit title bar with the added bonus that it can be called from an access query and used on a recordset.

CountStringElements. This will count the number of words, letters etc in a string, delimited by whatever you enter.

Numericextract. This will basically extract numeric values from strings, so if you enter (test45324this43234string12) with your delimiter set to "_" the result should be = (45324_43234_12).

"All three functions can be used in either Access 97 (possibly access 2.0) and Visual Basic Version 5.0."

Roger Taylor

reaper2098@yahoo.com

I have included Roger's code as a text file on our cover CD as ROGER.TXT. This has the advantage of making it as widely available as possible. However, if you import it into Access or anywhere else watch out for hard returns in the code which may render it dysfunctional. The mail system helpfully inserted lots — I think I got them all, but you never know.

PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the *Hands On Databases* column. Write to him c/o the PCW editorial office (address, p10) or email him at database@pcw.co.uk.



Seconds out...

That's all the time it takes to keep your PC's BIOS up to date. Once a convoluted and time-consuming task, these days it takes no time at all. Roger Gann explains how, and why.

Just as it always makes good sense to keep on the lookout for the latest device drivers for your graphics and sound cards, by the same token it's also a good idea to keep your PC's BIOS up to date.

Upgrading the BIOS in older PCs used to be a less-than-straightforward task because the BIOS firmware was contained in EPROM chips. The only way to upgrade the BIOS in this case was to extract the EPROM chips (there used to be a pair) from their sockets on the motherboard and replace them with new ones.

You can still upgrade many older motherboards bought in this way but the cost of the chips is often not much different from the cost of a new motherboard, so the upgrade is not really economical for old clunkers. You also have another problem in tracking down suppliers of these chip upgrades. To the best of my knowledge, there are only a handful of suppliers, and all are to be found in the United States.

Times have changed, though, and BIOS upgrading is a much simpler task these days. More recent motherboards come equipped with a Flash BIOS, a special kind of chip which is electrically erasable. With appropriate software, BIOS upgrades can be accomplished from a floppy disk. It's a relatively simple task and, in most cases, takes no more than a couple of seconds to perform. And, if you have a motherboard that is less than a couple of years old, the chances are that a BIOS upgrade is available for it.

Reasons to upgrade, one...

There are a number of reasons why you might want to upgrade your BIOS. The first should come as no surprise — bug fixes.

Motherboard manufacturers buy BIOS code from outfits like Award and AMI and customise them for a particular motherboard. While it is rare for the BIOS authors to make mistakes, minor bugs introduced by the manufacturer are relatively common.

For example, my Asus TX-97 motherboard BIOS had a bug that prevented it from reliably recognising a GoldStar CD-ROM drive. And guess what sort of CD-ROM drive I'd fitted to that PC? Yup, got it in one! A BIOS upgrade fixed this and a host of minor buglets.

Reasons to upgrade, two...

A second reason is to introduce new-and-improved features. For instance, many older BIOSes lacked support for EIDE/LBA hard disks and only supported CHS-style disk sector addressing. This effectively prevented them from handling hard disks larger than 504Mb. True, these disks came with special translation software that permitted their easy installation but I always felt it was better that the system handled the hard disk directly in "native" mode.

I had trouble installing a large (850Mb) IDE drive in a Gateway 486. I downloaded the upgraded BIOS from the Gateway web site and my problems evaporated.

I recently upgraded the BIOS on an Intel Endeavour motherboard and noticed that the BIOS sign-on was more informative, identifying the hard disks and CD-ROM drives attached to the IDE interface. Not an earth-shattering improvement, but a nice touch. The other good thing is that, unlike the BIOS chip upgrades, these sorts of upgrades are gratis: you pay only for net connection and phone time. So there is no excuse for not keeping your BIOS refreshed.

How do I upgrade?

Your first step to upgrading is to identify the manufacturer of your motherboard. A seemingly simple task but one that can often be more difficult than it may at first appear. Sadly, many motherboards are poorly labelled — they're often fairly anonymous designs that give no clue as to their manufacturer. Worse still, the scanty documentation accompanying them rarely gives much away.

So how do you identify them? There are two methods I use. The first is to carry out a simple search on the internet using the motherboard's model number as the search string.

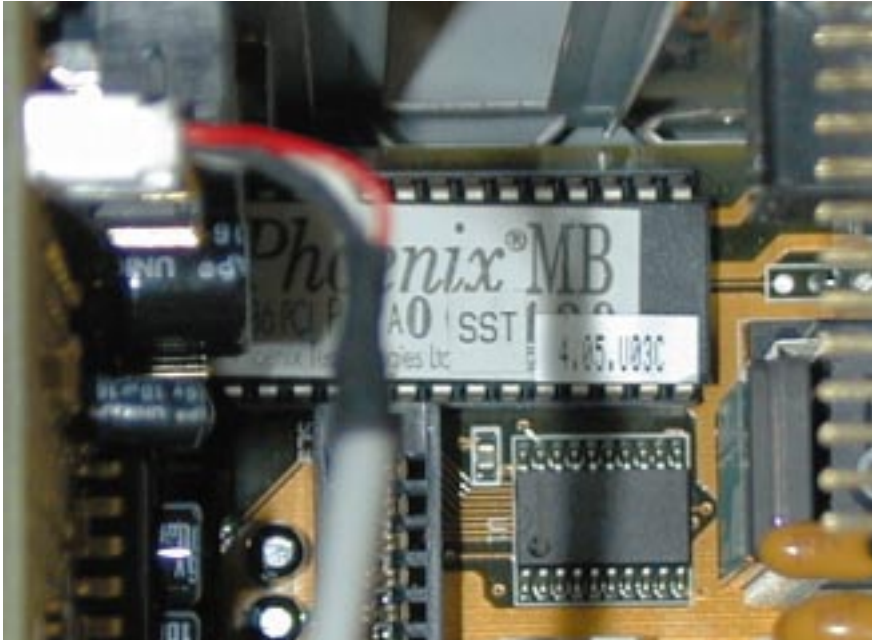
I found the usual search engines to be a clunky way of searching. Instead, I use a free utility, WebFerret (www.ferretsoft.com). This hits no less than ten search engines at once and then de-dupes the results. Using WebFerret, I was able to identify my otherwise unidentifiable UM8810P motherboard as having been made by the EliteGroup.

If you have an Award or AMI BIOS, there is a second way: examine the BIOS as it is

Useful web sites

Here's a shortlist of some fairly tasty web sites that have oodles of techie motherboard info.

- Pride of place goes to Tom's Hardware Guide at www.tomshardware.com/.
- Another site worthy of your attention is Motherboard HomeWorld at www.motherboards.org/.
- Megatrends can be found at www.sysopt.com/mboard.html>
- The PC Guide resides at www.pcguides.com/.



Flash upgrades mean inaccessible BIOS chips can be brought up to date from the keyboard

displayed at the foot of the screen during the boot sequence. A BIOS ID number appears at the bottom of your screen after power on, during the memory check. Use the PAUSE key at this point and write down the BIOS number, the date, and the version.

Thus, a seemingly random string of letters and numbers contains important information about the motherboard. For example, 2A59CQ1CC. This Award BIOS number breaks down as follows:

2A59C stands for the chipset used; here it's the Intel Triton FX chipset.

Q1 stands for the manufacturer; QDI.

CC stands for the motherboard model; P5I437/250A.

There are too many motherboard codes to list here but trek over to Wim's BIOS web page at (www.ping.be/bios) for a pretty thorough code listing, plus hot links to the manufacturers' web pages where the BIOS upgrades can be found. This page also includes a couple of useful utilities to help you identify the Award/AMI BIOS number and possible manufacturer.

Made in Taiwan — slowly

The BIOS files themselves are normally fairly small, around 128Kb in size, and often include the "flashing" utility required to perform the upgrade.

Note that many of these companies are located in Taiwan and internet connections to this part the world can be a little on the slow side. I found many web sites hosted here to be fairly unresponsive, typically

requiring several visits to successfully download these relatively small files. Very often the upgrade can be performed from a DOS prompt, but sometimes you have to create a special boot floppy containing the new firmware. For example, Compaq and AST upgrades are done in this way.

FAT is a confusing issue

Dr Alan Choo-Kang wrote in to say: *"I have read with interest your recent articles on adding large hard drives. It is an area that has always confused me. Alas, some things are still not clear. First, what is it that actually limits the size of a partition or logical drive to 2.1Gb? Is FAT16, isn't it? If I'm right, how is the 2.1Gb calculated? And what is the resultant cluster size if a partition is made 2.1Gb?"*

"Second, what actually determines the cluster size? Am I right in thinking it is the size of the primary partition? If so, am I wasting huge amounts of space by having a primary partition of 1.99Gb — rather than the 511Mb you had suggested — while still using FAT16 (the rest of my 6.4Gb disk is carved up into two 1.99Gb logical drives).

"My final question relates to a discrepancy in the various ways the size of my disk is reported. It is supposed to be 6.4Gb. FDISK reports total disk space as 6150Mb (=6,448,742,400 bytes according to their definition of a megabyte). Right-clicking the three drives C, D and E in 'My Computer' gives me three drives each of 2,146,467,840 bytes (reported as 1.99Gb).

This totals 6,439,403,520 bytes which is different to what FDISK reports. Why is there a difference and is my disk 6.0 or 6.4Gb?"

The 2.1Gb limit is part of FDISK under the FAT16 file system; it's an absolute ceiling on a primary partition size. You can create an Extended partition larger than this, but the logical drives cannot exceed this size.

The cluster size of a 2.1Gb partition is 32Kb. This size is determined by simple maths: the maximum number of entries in the File Allocation Table is 65,536 so you divide this number into the partition size to derive the cluster size.

For those new to this arcane subject, a cluster is a number of 512-byte disk sectors clumped together to form a single unit for DOS' administration purposes. So, a 32Mb partition would have one sector per cluster, 64Mb would have two or 1Kb sectors, and so on. As you double the partition size, you double the cluster size: 128Mb = 2Kb, 256Mb=4Kb, 512Mb=8Kb, 1,024Mb/1Gb=16Kb, 2Gb=32Kb.

If it's storage efficiency you're after, you should pick a smallish partition size. But with today's hard disks having such a low cost per megabyte, you might not care about wasting a few hundred megabytes.

This brings me on to the final part of your question. The answer depends on your definition of a megabyte. Call me old-fashioned but I like to think that a megabyte is 1,024 Kilobytes or 1,048,576 bytes (210) and that a gigabyte is the square of this. Hard-disk manufacturers take a more liberal view and when they refer to "megabyte" they really mean a million bytes and not the larger figure; they're rather relying on you equating their definition of a megabyte with a real megabyte, when in fact it's about five percent less. This explains how a 6.4Gb disk is, in reality, a 6Gb .

The missing space, about 9Mb, is something of a mystery. Some space is always lost to the FAT file system itself: your partitions are about 1Mb less than 65,536 x 32Kb, for example. It may also be that the discrepancy is simply unpartitioned space. Either way, it's such a small quantity of disk space, it's really not worth losing any sleep over.

PCW Contact

Roger Gann can be contacted c/o the PCW editorial office (address, p10) or via email at hardware@pcw.co.uk.



Break-out

You wouldn't notice, but inside every sound card is a sophisticated synth just waiting to escape: Steven Helstrip shows you how to use non-standard controls to unleash that power.

Onboard every sound card there's a sophisticated programmable synthesiser just waiting to be tweaked. But with no front panels nor sliders to speak of, much of what's on offer goes unnoticed. If your WaveTable card is GS or XG-compatible, the main parameters can be edited with standard CCs (Continuous Controllers) from your sequencer, or editing software. Although this provides some access, there's nothing like getting your hands on real knobs (*no smirking!*) to fine tune, say, the filter cutoff and resonance of a bass patch. Help is now at hand, though, in the form of Phat Boy so see the box, on page 264, for my mini-review of this product.

Meanwhile, I mentioned that it is possible to control GS and XG parameters with standard CCs (see Table 1). However, if you have an AWE-32 or 64, this is slightly trickier because the cards make use of an obscure set of NRPNs (Non-Registered Parameter Numbers) for basic editing.

What are NRPNs?

Non Registered Parameter Numbers are a

bunch of non-standard controls for editing MIDI parameters. Although these are effectively CC messages, a group of three or four events are needed to change a parameter value.

First, the required parameter number has to be written to CC98 and CC99 (NRPN LSB and NRPN MSB), followed by two

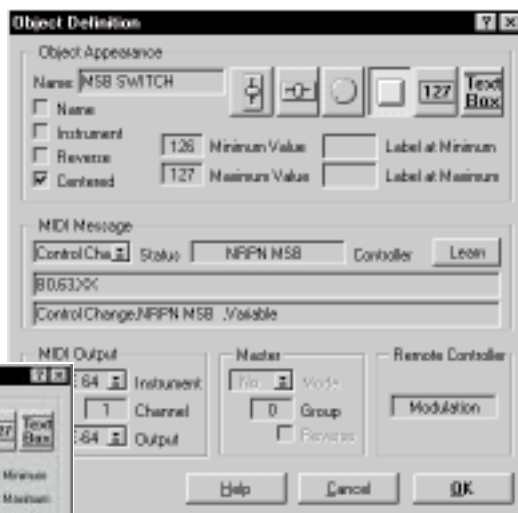


Fig 1 (above) Switch to set NRPN MSB

Fig 2 (left) Settings for the filter cut-off fader

with Cubase, to provide a usable front end for the AWE cards.

1. On a new track, set the class to Mix Track by clicking in the C column and create an empty part (Ctrl P).
2. To open the Mixer Map window, double-click on the newly-created part. The first object we're going to create is a switch to fix NRPN MSB to 127. By doing so, we can then select any control parameter by sending a single NRPN LSB.
3. To create the new object select the New tool and click on the desktop, which will open the Object Definition dialog.
4. Select the switch, or button object and set the minimum value to 126 and the maximum value to 127 (Fig 1).
5. On the Input Line, enter B0,63,XX.

If you're not up on programming in hexadecimal (*and who is?*), this translates to MIDI as follows: B0 is the status byte for selecting a continuous controller; 63 in hex selects controller 99 (NRPN MSB) and XX is

data entry values to CC38 and CC06 (Data Entry LSB and Data Entry MSB).

This system provides 14-bit resolution, as opposed to MIDI's standard seven bits, enabling up to 16,384 controllers to be set with a value of equal resolution. This is way over the top for standard programming requirements and makes programming itself more difficult than it needs to be.

Create a mixer map

You don't need to fully grasp NRPNs to put them to use, though. If you use Cubase or Cakewalk it is possible to create a mixer map to assign the controllers to single faders. And, over my next two columns, this is exactly what we're going to do, starting

Table 1 — Controllers

GS & XG Common Synth Parameter CCs

CC	Parameter
73	Envelope Attack
72	Envelope Release
65	Portamento On/Off (0=Off 127=On)
5	Portamento Time
71	Filter Cutoff
74	Resonance
91	Reverb Send Level
93	Chorus Send Level
7	Main Volume
11	Expression (secondary volume)
10	Pan Position

COMPETITION

Win a home studio for your PC!

Here's your chance to win a Terratec EWS64S sound card complete with a full-size, four-octave MIDI controller keyboard to get the most out of it. Together they're worth around £290, but they could be yours, free, if you enter our competition.

The EWS64 S walked off with the *Editor's Choice* award in our July issue sound card group test. It offers a winning combination of hardware features, software support and value for money.

- There's a massive 64-voice synth and sampler, hardware mixing for digital audio applications and a four-channel output for Direct3D games.
- Inside the flight case there's also a CD crammed with audio utilities and applications,

including Cubasis AV for combined audio and MIDI sequencing.

- No studio would be complete without a MIDI keyboard and this is no exception. The MIDI Master Pro provides a velocity-sensitive four-octave keyboard with aftertouch and a connector for a sustain pedal.
- The onboard LCD display enables you to configure the data slider to send a range of controllers, including reverb and chorus levels and there's full access to bank change parameters. There are also pitch bend and modulation wheels and buttons to transpose the keyboard range +/- three octaves.

• To enter, answer the following questions:
a) How many voices does the EWS 64 have?

b) Is it true that the EWS 64 has a built-in sampler?

c) How many octaves does the MIDI Master Pro have?

Send your entries on a postcard, or on the back of a sealed envelope to: Terratec Competition (HoS), PCW, 32-34 Broadwick Street, London, W1A 2HG.

Closing date for entries is 27th August, 1998. The first correct entry drawn will win the prize. Usual PCW competition rules apply (see p289).



the variable for setting the controller value. In this case, when the button is depressed, this will be fixed to 127.

Got it? Don't be put off, you'll only have to go through this once.

6. Set the MIDI output to the AWE driver.
7. Click OK to return to the Mixer window and resize the button object so that it's at least visible. You can create a text object if you wish to label the button as, say, Power.



Fig 3 A glimpse of what's to come next month

Create a fader

The next object we're going to create is a fader to control frequency cut-off.

1. In the Object Definition dialog select the vertical fader and give it a name like Cutoff.
2. The Input Line (see Fig 2) needs to read B0,62,15,B0,26,XX (also see Table 2).

We now have a fader set up to control frequency cutoff. To try it out, record a part on MIDI channel 1 on the AWE output. Leave the part running in cycle mode and open the mixer map. First click the "power" button to establish the NRPN MSB and try out the fader.

Table 2 — Hex

Hex	Meaning (Decimal)
B0	CC Status Byte
62	CC 98: NRPN LSB
15	Parameter 21: Filter Cut-off
B0	CC Status Byte
26	CC 38 Data Entry LSB
XX	Variable

Next month, we'll add 25 more controllers, which will look something like Fig 3. In the meantime, don't forget to save the mixer map before closing Cubase.

p264 >

Product update

Cakewalk models

Now in version 7, Cakewalk Pro Audio is fast catching up with Cubase VST and offers up to 64 tracks for audio playback in addition to 128 real-time digital effects.

The new Console view is designed to emulate a professional mixing desk and provides access to both MIDI and audio channels, rather than having to deal with separate windows. In fact, all your arrangements can be recorded and mixed from here.

Effects can be applied as inserts, or used as auxiliary and master processors. Bundled plug-ins include a two-band parametric EQ, stereo reverb, delay, chorus and pitch shift modules. There's also support for third-party DirectX plug-ins.

Automation has been introduced in the Console view and sub-mixes can be set up with colour-coded groups busses. Other high-end features include native support for Yamaha's DSP Factory and multi I/O cards.

The user interface has also been refined and the Track View now provides separate mute, solo and arming buttons per track, in addition to improved transport controls. Screen layouts can also be saved and there are new toolbars to provide quick access to the edit pages.



Cakewalk's new and improved user interface

■ Cakewalk Pro Audio Deluxe

Price £369 (£314.04 ex VAT)

Contact Et Cetera Distribution 01706 228039 www.cakewalk.com

Oil... Phat Boy

KeyFax (the same guys that developed the Twiddly Bits MIDI samples range) has come up with a solution that's so simple I'm surprised it has never been thought of before. It's an external MIDI device, called the Phat Boy, that provides 13 controllers pre-assigned to common synth parameters. It operates in three basic modes to provide compatibility with GS and XG instruments, Creative's AWE sound cards and software that has a "learn" function, such as ReBirth.

Along the top row there are controllers for filter (cut-off and resonance), vibrato (rate, depth and delay), reverb and chorus levels. From left to right along the second row there are ADSR envelope controllers (Attack, Decay, Sustain and Release), pan and volume settings. Sustain is not supported in the GS/XG specifications, so this control doubles as portamento rate instead.

As well as being able to record performance data to your sequencer in real time, the Phat Boy can also be used to generate new sounds based on preset patches. Once you have the knobs set up for the sound you're after, the snapshot button can transmit all the controllers to your sequencer so that it may be played back at a later stage. Holding the snapshot button down for three seconds performs a MIDI reset, returning the instrument patch to its default settings. A quick glance around the back reveals MIDI in and out ports, the mode select switch and the power connector. The MIDI out also doubles up as a thru, which enables you to sit the Phat Boy between your keyboard and PC without the need for a MIDI merge box. There's no on/off switch, which is really irritating, but that's the only real criticism I have. The knobs are high quality and the overall build quality is solid.

You may find it difficult to justify £160 for a box that does not itself make any sound but once you hook it up to your sound card you'll find it's worth every penny.

■ Price £159 (£135.32 ex VAT)

Contact KeyFax 01491 413939,

www.keyfax.com

★★★★☆



Questions & Answers

Q I am looking for a PC, mainly for musical purposes. I would like to record my vinyl LPs and singles onto CD and create my own mix CDs. I have seen a PII 266MHz with 64Mb RAM and a 6.4Gb hard disk. The system comes with a 32X CD and a SoundBlaster AWE-64 card. What hardware and software will I need to undertake these tasks? I would be interested in any recommendations you could make with regards to makes and models of equipment.

David.Millis@scbrew.co.uk

A First, it's important to get hold of an audio card with a high-quality ADC (Analogue to Digital Converter). The AWE-64 is a good card but falls short in this department. The good news is that Orchid's NuSound 3D, which has an excellent ADC and high signal-to-noise ratio, comes in at £49. Secondly, invest in a high-quality cable to connect your mixer to the sound card's line input.

The best software option is Steinberg's Wavelab, which integrates audio recording and CD burning in one package. Version 2 has just hit the streets and now provides 13 audio plug-ins, including compression and high-quality EQs. There's also full PQ coding which will let you create track indexes to separate your mix CDs. For cleaning up vinyl scratches and surface noise levels, Sonic Foundry's Vinyl Restoration goes to work and provides excellent results with virtually no loss of dynamic range.

Wavelab uses CeQuadrat's CD-writer drivers. To check for supported devices go to www.cequadrat.com.

SCSI drives give the best performance and support audio extraction, which enables you to digitally import audio tracks from CD. Sadly I can't recommend a drive because I only know one and I understand that it has been discontinued.

PCW Contacts

Steven Helstrip can be contacted at the usual PCW address (p10) or via email at sound@pcw.co.uk

Orchid 01256 479898

Sonic Foundry plug-ins from SVC London 0171 923 1892

Steinberg Wavelab from Harman Audio 0181 207 5050



A touch of **class**

Why wallow in mono when you can delight in duo? Duotones can be any colour you like and bring an air of sophistication to those dull two-colour documents. Ken MacMahon explains.

Duotones have emerged as something of an artform. The depth, quality and subtle colouring of duotones, tritones and quadtones conveys a quality that is impossible to achieve with either monochrome or full-colour reproduction.

Duotones can be any colour you like and are an inexpensive way to add some class to a two-colour document. You can print duotones on an inkjet or colour laser printer with excellent results. The only problem is that you'll need a PostScript printer, and PostScript colour printers can be expensive.

One option is to convert your duotone image to CMYK prior to printing, although it has to be said that this doesn't do an awful lot for the quality. A better option is to buy a software PostScript RIP (raster image processor) which will enhance your printer's capabilities considerably.

Choosing your subject

Producing good-quality duotones isn't difficult; it just takes a little care. The first thing to understand is that colouring a greyscale tif in an image editor or DTP program does not a duotone make. This just substitutes another colour for black which, technically, is a monotone and will, more likely than not, reduce rather than increase the tonal range of your pictures.

First, open the picture you want to use in Photoshop. It can be a colour or greyscale, but if it's colour, first convert it to greyscale by choosing Greyscale from the Mode menu. Pictures with subtle gradations of tone (misty landscapes, lots of fabric, sand, snow) make good subjects for duotones.

Next, select Duotone from the Mode menu and the duotone dialog will appear. This shows a pull-down menu and four



Subtle gradations of shade can be captured with duotoning, as demonstrated with this sundial

swatches. For duotones you use only the first two, the remainder are for tri- and quadtones. Next, click the Load button and find the Pantone duotones directory within the Photoshop directory on your C drive. In here you will find a broad selection of Pantone spot-colour duotone curves. Each colour has four associated curves; the first produces the strongest tint of the second colour, and the fourth the weakest, with two stages in-between.

Notice that the black ink is at the top and the lighter Pantone underneath. If you

specify your own colours, make sure you descend from darkest to lightest as this is the order in which the inks print if outputting the image directly from Photoshop.

Curves and colours

You can either edit the curves or select your own duotone colours. I find the best approach is to select a Pantone curve close to the colour I want from the Photoshop presets, and then double-click the colour swatch to select the precise Pantone for which I am looking.

If you edit the curves, you are not making pixel adjustments but editing a transfer function determining the distribution of inks on the two plates. Boxes to the right of the curve indicate the percentage of ink present at that point of the tonal range for that ink. The trick is to remove black and substitute the second colour in those mid-tones, to highlight parts of the curve that would benefit from enhanced tonal range.

In the shadows

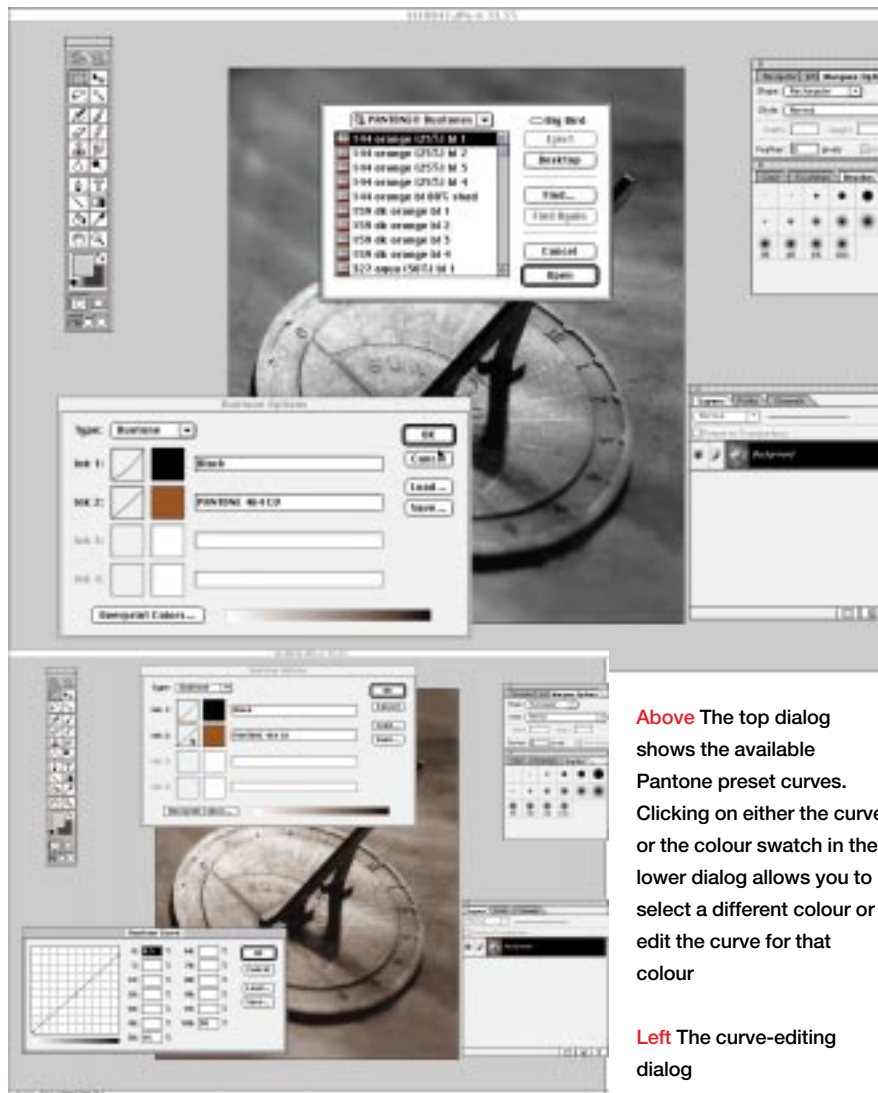
Generally speaking, greyscale images which have been converted to duotone tend to look dark and muddy, particularly with warm second colours, so you often need to adjust the black plate curve to remove ink, particularly in the shadows. What you do with the second colour will depend very much on the kind of end result you're looking for.

If you want make a visual check on the ink distribution on the two plates, convert to a multi-channel image, again from the Mode menu, but don't forget to undo before making any other edits because the separate channels cannot be recombined into a duotone image.

If you want to import your duotone into another application, you'll need to save it as an eps file as only this format can retain the separate plate information. It's essential to use identical names for the spot colour, both in Photoshop and the package you intend to import into. Quark XPress, Adobe Illustrator or Macromedia Freehand will add spot colour to the palette and give it the same name. But if you're importing the image into a document you're already working on, make sure you haven't already defined your spot colour with a different name or you'll end up with three plates instead of two.

Angle on spot colour

You also need to make sure that the spot colour is set up to print with a suitable screen angle. Using Quark XPress I've had good results assigning any of the remaining three process colour default screen angles. According to the Photoshop manual different screen angles produce different results, but it doesn't say how or why and I, for one, would be interested to know. Crucially, make sure you do not select black (assuming that black is the other colour in your duotone) because this will result in the colours overprinting. This is particularly important for XPress users: the default for spot-colour screen angles is black, so ignore it at your peril.



Above The top dialog shows the available Pantone preset curves. Clicking on either the curve or the colour swatch in the lower dialog allows you to select a different colour or edit the curve for that colour

Left The curve-editing dialog

Book review

Title Illustrator Type Magic

Author Greg Simsic

Publisher Hayden Books

Price £37.49

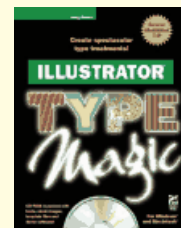
ISBN 1-56830-334-3

This is a very hands-on kind of book. Following a brief Basics section for Illustrator novices, it gets straight into the business of creating all kinds of type effects, alphabetically arranged from Accordion to Transparent.

Each section is around half a dozen pages long and, after a short explanation of what can and will be done, it gets straight down to business with a step-by-step explanation of exactly how to reproduce the effect. Accordion produces type that looks as if it's printed onto a concertina-folded piece of paper. At 17 steps it's one of the more complicated effects, though the first eight are to do with creating the folded paper. Then, it's really just a question of creating the type, converting it to paths, using it to crop a copy of the concertina, shearing all the bits and changing the colour. After Accordion you can try out, among others, antiquing, bevelled, fake 3D, filters, paths, patterns, scribble and shadows. There's also a section on taking paths into Photoshop to create raster effects. Some of the sections give advice on how to adapt the technique just described to produce variations on the theme.

There's a companion CD with examples from the book as well as a selection of free fonts from 16 type foundries, a few stock photos, plug-in demos including KPT vectors, Extensis Vector Tools and Alien Skin Stylist. Also included are demos of PhotoShop 3.05, Illustrator 6, Streamline 3.1 and Fontographer. It's a disappointment, though, that they are not more recent versions, particularly as the book covers Illustrator 7 and you'd assume anyone interested in buying it would be using at least version 6.

I very much like the direct approach of Illustrator Type Magic. Whenever I need to create type effects in future, this is the first place I'll be looking for ideas.



Questions & Answers

Q As an experienced user of CorelDraw 6 I am used to being able to import a scanned logo (two or more colours) into a publication and then make the background (usually white) invisible using "bitmap mask". So far I have been unable to achieve the same in PageMaker 6.52. Any clues as to how I might achieve this?

Kelvin Yue

A PageMaker doesn't have anything like CorelDraw's bitmap colour masks. You will first have to create a clipping path around the logo in a bitmap editing package such as Adobe Photoshop or Corel Photopaint, then save the graphic as an eps file with the clipping path and place it in PageMaker.

This is a much more accurate way of doing it than with a bitmap mask, because you don't have to rely on all the background pixels having the same value (often they don't, even if they all look the same). You can also choose exactly where you want the path to be. In a scanned photograph, for example, you might want to exclude distracting background detail like trees or lampposts.

Q I want to include a gif on a page in other applications. The gif in question came from the internet. IE will load it but no other applications will, giving me an error message.

Alex Pounds

A The easiest thing is to resave the gif in a format supported by the application you are using to import it. There are any number of free and shareware graphics file converters available on the internet. Paintshop Pro 5 will carry out this simple task and much more besides, and is available from www.jasc.com or on our PCW covermounted CD.

Q I have recently created a web site and have been scanning photos and posting them to my site. What is the best combination of scan resolution and jpg compression to display 5 x 4in prints at a similar size on-screen, without the filesize going through the roof? The pics online have a fine checkerboard pattern on them: is this the result of jpg compression? They have been scanned at 200dpi and have

a compression of two (the "small file" end of the 1-10 scale in Photoshop.)

Jon May

A Screen resolution is 72dpi so you should scan for same-size reproduction at 72dpi. Most flatbed scanners these days don't go below 100dpi, so scan same-size at 100dpi then resample the images to 72dpi before saving them in jpeg format.

The halftone screen, or dot pattern, is causing an interference pattern, sometimes called a moiré pattern, when you scan them. Your scanner may have a de-screen option which will reduce this. Alternatively, you can remove the pattern by either blurring the image slightly or, better still, by using the median filter to reduce or eliminate it. Often the pattern is more pronounced on one or two channels of the image because one of the four original CMYK screens was at the crucial angle which caused the interference pattern in the first place. Selecting only the affected channels before applying the filter will increase your chances of a good result without adversely affecting the overall image quality.

One last thing. If you are scanning images from published sources, be sure to check the copyright position before publishing anything on your web site.

Q An extremely annoying feature of Paint Shop Pro 3.0 is its habit of generating upper-case filenames for new files I create, even though I enter these names in lower-case type. Since I am generating components for a web site which runs on a Unix system, these names must be in lower case to work. I have to edit them by hand, which is tedious. How do I tell PSP not to do this upper-case translation?

Chris

A At the risk of sounding like an advertisement, why not upgrade to Paintshop Pro 5, which most certainly does *not* do this? Look at www.jasc.com.

PCW Details

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Let there be light

Benjamin Woolley explains how to create a well-lit 3D scene which looks realistic and is a joy to behold. Film directors would kill to enjoy the total control offered by virtual lighting!

The Creator's most memorable instruction was: Let There Be Light. When carrying out 3D modelling work, many forget this command, or rather the intricacies of executing it.

One of the great advantages, and challenges, of visualising a virtual scene is that you have total control over the lighting. Television and film directors, and directors of photography, would kill to have that luxury. They have something approaching it in a studio, which is why so much that you would think was shot on location (a simple house interior, for example) is, in fact, laboriously recreated within the studio. But even there, the skills needed to get the right effect can take years to acquire.

In a computer-generated scene, lighting is both simpler and more complicated. It is simple because most 3D packages will now apply a default lighting, which will do a perfectly adequate job of illuminating the scene. However, this should be treated only as a starting point, as a way of seeing what

you are doing before the serious business of lighting design begins.

The lights are on....

The first step towards good lighting is an understanding of "colour temperature", the colour that different light sources possess, which has a powerful effect on the overall colouration of a scene. The brightest light with the hottest temperature would be pure white, whilst the coolest would be total black. Fig 1 shows the colour temperature of more familiar lighting conditions: overcast daylight, full sunlight at noon, tungsten lighting and candlelight.

In all cases, the saturation for each colour has been turned up so as to make it more clearly distinguishable. If you wanted to bathe your scene in any of these lighting conditions, you would just tinge the main light source with the appropriate colour to achieve the correct temperature.

In nearly all packages, light of any temperature will come from one of three

types of source: ambient, omni and spot:

- Ambient light is everywhere, bathing the entire scene. It casts no shadows, comes from no particular direction and it doesn't fade into the distance. Most packages have a default setting for ambient light, which in my opinion should always be zero. If you have any ambient light at all, even at a level that appears to be more or less black when you select its colour, it will do serious damage to the shadows and light contours that are so essential to giving an image a sense of depth and texture.
- Omnis cast their light in all directions, and are often compared to a bare lightbulb (in Ray Dream Studio they are called bulbs). They are often used for what is called fill light, which means they illuminate areas left dark by the main light source (the key-light). Unlike ambient light, an omni can cast shadows (this is usually an option). If you choose not to have shadow casting, the light starts to behave in a very unnatural way. For example, light passes through objects and illuminates those that would otherwise be hidden in shadow.
- Spotlights cast focused light in a particular direction. In some packages they can also be used as projectors, beaming a static or animated bitmap (it would be called a "gobo" in theatrical or film lighting circles) into the scene. You might use a projector light to create the effect of the light of a flickering fire being cast across the furniture in a room.

The beam of a spotlight is like a cone which spreads out as the light gets further from the source. You usually have two cones, one inside the other. The narrower one is the "hotspot", which is the area of maximum light intensity. This is surrounded by the wider fall-off cone, where the level of



Fig 1 The spots produced by the beams of four spotlights pointing downwards, each coloured to show the temperature of different light sources. From left to right: candlelight, tungsten light, full sunlight at noon and overcast daylight. These colours are saturated, so if you were using them to set the colour temperature of lights you would reduce the saturation level to about half of this. So, the hue/saturation/value (HSV) levels for overcast daylight might be set at 130, 40, 255 (or 215, 253, 255 in RGB terms)



Fig 2 (above) & Fig 3 (right) The model and texturing used in these two figures is identical; all that separates them is the lighting scheme. In Fig 2 the light source is a distant omni. The result is flat and featureless. In Fig 3 the light comes from two spots, the most powerful (the "key") is an upright tinged orange, designed to emphasise the sinister features of the mask, the other (the "fill") is a very faint, grey-coloured sidelight designed to fill in a few details lost in the shadows

illumination gradually decreases to darkness. If the hotspot is as wide as the fall-off, you have a beam like a follow spot in a theatre. If the hotspot is much smaller, the beam has a softer edge.

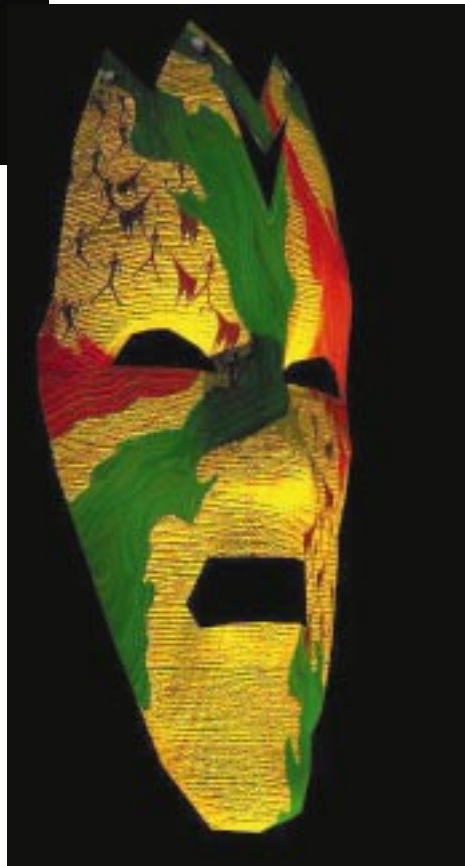
Lighten up

The starting point for creating a successful lighting scheme obviously depends on the scene being lit, but in nearly all circumstances it begins with ambient light being switched off (there may be exceptions to this, such as when the scene you are creating is extensive and you have

not got the time to properly light each part of it). Many packages now support what is called "directional" light. It is rather like ambient light in that it covers the whole scene but comes from a certain direction, with parallel rays of light. A directional light can cast shadows, and is ideal for simulating sunlight.

Omnis are tricky. They provide a lazy way of putting light into a scene but are very difficult to control and should be deployed sparingly. They are best used either in the distance as fill lights, or very close to objects to create artificial highlights. Bear in mind that omnis add light to a scene which can be hard to control, and may ultimately wash out details that you would prefer to be kept.

Spots are the most important lighting tool, so concentrate your efforts on using these to create the structure of your scheme. Use them sparingly and keep the colour temperatures to a minimum. They should pick out the most important features in the scene towards which you



want the viewer's eye to be drawn.

Unless you want to illuminate a flat pattern (a picture, say), the light should not fall in a perpendicular direction onto the object it is illuminating. This will make the

object and its texture look flatter. Instead, place the spot to one side. This is especially important if the object's texture uses bump mapping (see Figs 2 & 3).

If you want to see the very best use of lighting in a computer-generated scene, visit sites like Pixar's at www.pixar.com and examine their images. Ask yourself these questions: from which direction is the main light source coming, and what sort of light is it supposed to provide?; how many light sources are in the scene?; how much of the image is in shadow, and how dark are the shadows?

Getting three dimensional

When it was first launched, Fractal Design's Detailer was one of those products that seemed a little ahead of its time. It offered the ability to paint 3D objects on a PC platform, and most PCs simply weren't up to such a demanding task. Now, after both the company and the package have been given new names, I thought I would see if the software's time had yet come.

Running on a 300MHz Pentium II system with 64Mb RAM, I can confidently announce that it has. The mask featured in Figs 2 & 3 was created using the Painter 3D tutorial (available only on the CD in the form of a PDF document) and, as Fig 3 shows, you can create some very rich textures. These can be painted directly on the model using a variety of tools from fine drawing pens to "hoses" (the same tools you find on MetaCreation's Painter 2D paint package).

You can also paint onto the mesh, which appears in a separate window flattened out (think of the relationship between a bearskin rug and a bear). Having the ability to do both provides great flexibility without demanding the processing power of an SGI workstation.

Unlike Detailer, Painter 3D will allow you to export models and all their maps (texture, bump, shininess, the lot) to a range of other 3D file formats, such as 3DS (useful for TrueSpace as well as 3D Studio).

The interface is a bit messy but once you get to grips with it, this package trounces the materials editors you find bundled into most 3D authoring packages.

PCW Contact

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Decline and fall

With the world moving to a web model, Windows development will inevitably decline, argues Tim Anderson. Plus, VideoSoft ActiveX controls and some advice for programming novices.

There is a new version of Microsoft Office waiting in the wings and I recently attended a preview. Office is interesting to developers, partly because it is a development platform for Visual Basic and partly because Office applications form a de-facto standard for other Windows software.

Judging by the preview, most of the new features in Office are web related (Fig 1). For example, HTML and its more sophisticated cousin, XML (Extensible Mark-up Language) are to be companion file formats making the web browser a universal viewer for Office documents. It goes beyond that, in that Microsoft envisages documents as having their primary existence in online form, published not to print but to a web server. Tables and charts can be linked to live data and dynamically updated. You can embed threaded discussions into a document.

The web concept extends to deployment, too. Installing Office will no longer involve layers of setup options, where you decide whether or not you really need the equation editor or the Obscura Specialismo font. Instead, you will just install core components, and extras like grammar checkers or data access features will be downloaded from a corporate server on demand. We are also promised a unified Visual Basic Environment, with Visual Basic for Applications 6.0 and forms built from Dynamic HTML. The browser, originally a viewer for web pages, is evolving into a runtime platform for documents and apps.

In taking Office in this direction, Microsoft is walking a tightrope. Office has more or less won the market as the standard corporate word processor and spreadsheet but the web-authoring market is altogether different territory. To get full

value from the new-style Office will require Microsoft's Internet Information Server as the web server and installation of the core Office components on the clients.

Local issues

The reason is that to host Office documents with all the clever new features will require proprietary server extensions similar to those required by FrontPage. On the client side, full interaction with something like an Excel chart embedded in a web document will need Excel installed locally.

If a company decides to adopt the web model for both document distribution and application deployment, it may also decide to use Unix web servers and to insist that all web pages work equally well in Internet Explorer or Netscape, on Windows and on other platforms. In this scenario the new Office looks much weaker, having to fall back on its ability to generate standard HTML.

Caught in the web

The point is, as the nineties has belonged to Windows so the next decade belongs to the web. Microsoft realises this, hence the strenuous efforts to establish Internet Explorer and Internet Information Server. It is also the reason for its increasing focus on BackOffice server products such as Exchange and SQL Server, as these fit well into the web model, whereas the importance of Windows as a client can only decline.

You can find a further sign of the times in the new Delphi 4.0. This is still a fantastic

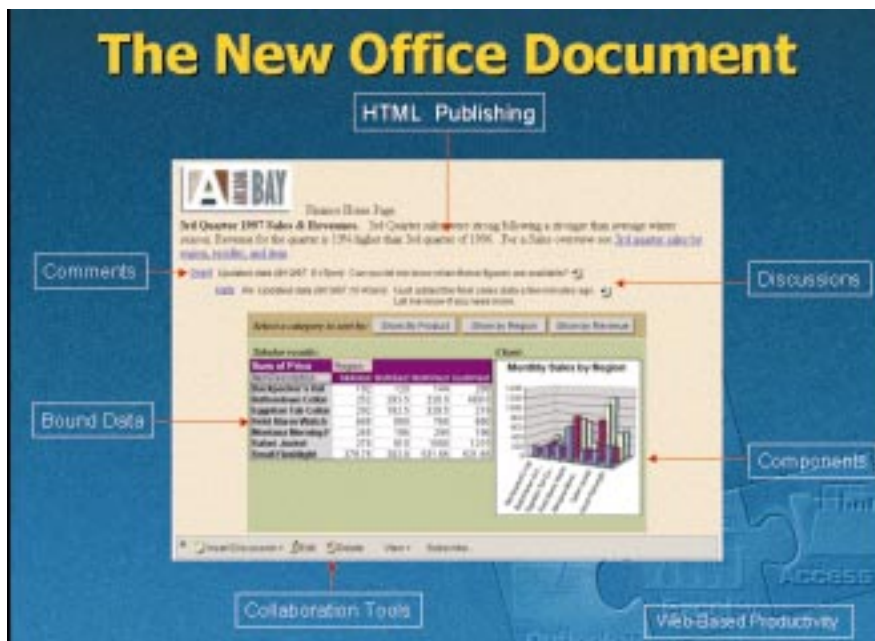


Fig 1 This mockup of an Office web document shows the direction in which Microsoft is going: online documents with embedded discussions, subscription options and dynamic database links

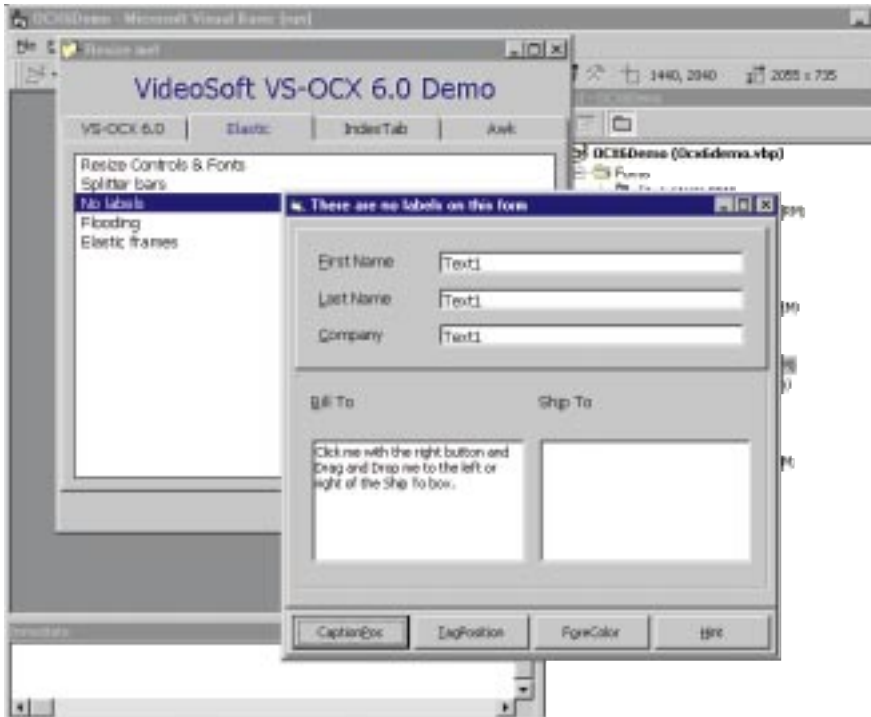


Fig 2 The elastic control at work. This form resizes its controls automatically and the labels are generated from tag values at runtime

Windows development tool but Inprise is moving away from the Windows-specific COM standard and towards cross-platform CORBA. On the Inprise web site you will find a white paper by Rick LeFaivre, a senior vice president, with the following comment: "The enterprise is a heterogeneous place... a proprietary distributed object computing infrastructure is not acceptable to enterprise customers."

Delphi 4.0 still has good COM support but Inprise has clearly signalled its desire to migrate customers towards other standards. A notable omission from Delphi 4.0 is support for OLE DB, the up-and-coming COM database interface.

There are a couple of immediate conclusions. One is that for pure Windows development, Visual Studio (which includes Visual Basic) is likely to become even more dominant. This is not as important a win for Microsoft as it first appears because the future lies not with Windows but with web development, distributed applications that use the browser as a client.

Strong competition

Microsoft has plenty to offer in this arena, as a glance at Visual Studio shows, but it also faces an array of strong new competitors. Even standalone PCs will be influenced by this trend and, with faster web connections, few PCs are now truly standalone. Developers take note.

ActiveX with VideoSoft

VideoSoft made its reputation with a VBX called an elastic control. This was a container that solved a problem inherent in any graphical interface. It automatically resized its child controls when its own size or resolution changed (Fig 2). VideoSoft now has other controls to offer as well. The VSFlex control is bundled with Visual Basic 5 as the FlexGrid control. VSReports lets you view Access reports without the Access runtime DLLs.

Elastic fantastic

The elastic control is still going strong, in the form of VS-OCX and VS ElasticLight. ElasticLight is an entry-level resizing control and is also included in the full VS-OCX package. For some reason, VS-OCX also includes a tab control called vsIndexTab and a file-parsing component called vsAwk. It's an odd bundle, but each component is very useful.

Getting started with vsElastic is a matter of putting it on a VB form and setting its Align property to vsFill, which asks it to fill the client area of the form whatever its size. Other controls such as buttons and list boxes can then be placed on the elastic container. Finally, set the AutoSizeChildren property to a value such as azProportional. Now the controls will resize dynamically at runtime.

This is useful but you are likely to want more control, available through other

properties. For example, you can set FontResize to off and have controls resized while the font size remains fixed. You can set the Splitter property at "on" to have a splitter area appear automatically between controls, so users can determine the relative size themselves.

Another neat option is a set of Tag properties. The idea is that instead of placing labels next to controls, for example in a data entry form, you put label text in the Tag property of each control. The Elastic control can then be set to display these as labels, with a variety of alignment options.

A new option is GridMode, which imitates the GridBagLayout in Java. Auto-resizing has been in Java's graphics library from the beginning and GridBagLayout is its most sophisticated form.

Unearthing a gem

The third control bundled with VS-OCX is vsAwk, named after the awk utility (actually a mini-programming language) familiar to Unix users. It's an invisible whose purpose is to parse text files, and it's a gem. Simply set the filename property to the file you want to parse and vsAwk lets you do sensible things like search for a string, treat the file as a database with each line being a record, or go to a specified line and read it.

A great additional feature is that vsAwk can evaluate expressions. This means you can have a text box on a form, for example, in which the user types expressions like "45*1.175" or "Sin(45)". Feed this into vsAwk and you can then read back the result in the Val property. If you have ever needed to implement this feature, you will know that it is tricky to do it properly without an add-on like this.

The VideoSoft flyer is headed "Components you will actually use", and for once this is a fair comment. VS-OCX is an unusual bundle but one that has the potential to save you from a lot of fiddly code. I will be looking at some of the other VideoSoft controls in the future, but in the meantime I can gladly recommend this one.

Registry entries

I've had a letter from reader Stephen Anderson asks: "I want to be able to write a program that can read, write and delete information from the system registry in Windows 95. I have found the save and get settings useful, but they will neither let me put the information in a particular area of the registry nor read certain data such as which

Fig 3: Code to read a registry value

```

Option Explicit
' Normally API functions are declared as public in a separate
' module, but they are private here for convenience
Private Declare Function RegQueryValueEx Lib "advapi32.dll" _
Alias "RegQueryValueExA" (ByVal hKey As Long, _
ByVal lpValueName As String, ByVal lpReserved As Long, _
lpType As Long, lpData As Any, lpcbData As Long) As Long

Private Declare Function RegOpenKeyEx Lib "advapi32.dll" _
Alias "RegOpenKeyExA" (ByVal hKey As Long, _
ByVal lpSubKey As String, ByVal ulOptions As Long, _
ByVal samDesired As Long, phkResult As Long) As Long

Private Declare Function RegCloseKey Lib "advapi32.dll" _
(ByVal hKey As Long) As Long

Const HKEY_CLASSES_ROOT = &H80000000
Const REG_SZ = 1
Const ERROR_SUCCESS = 0&
Const KEY_QUERY_VALUE = &H1

Private Sub Command1_Click()
Dim sVal As String
Dim lRetVal As Long
Dim lLen As Long
Dim hKey As Long

sVal = String(256, 32)
lLen = Len(sVal) - 1

' open the key
If RegOpenKeyEx(HKEY_CLASSES_ROOT, ".exe", 0, KEY_QUERY_VALUE, hKey) = ERROR_SUCCESS Then
If RegQueryValueEx(hKey, "", 0, REG_SZ, ByVal sVal, lLen) = ERROR_SUCCESS Then
MsgBox Left(sVal, lLen)
End If
RegCloseKey (hKey)
End If

```

version of Windows the user has and to whom it is licensed."

Deepu Chandy Thomas has a similar query: "I want to read a value from the Windows registry using VB5. I opened the key with RegOpenEx and I'm not sure how to use RegQueryEx to read the default subkey. I want to read the value HKEY_CLASSES_ROOT\.exe\ (Default) having a value "exefile". What value do I give to subkey in the RegQueryEx API call?"

It is true that VB's built-in registry functions are very limited. They are intended to duplicate the functionality of application-specific INI files, rather than give you full access to the registry.

Part of the reason is for safety. Changing

registry values can scramble Windows, so it is better to use another approach where possible. GetVersion and GetVersionEx are API functions to find the current version of Windows, and GetUserName will find the name of the current user.

For advanced use of the registry, there is a set of API registry functions. Like all API functions, these need to be used with care and doubly so in the case of the registry.

Fig 3 shows how to read the value mentioned by Stephen and you should note especially the use of ByVal directives and the checking of return values.

This will get you started, but there are other registry functions, and you should check an API reference for full use.

Beginner's corner: where do I start?

Ian Smith writes: "As a novice computer fanatic with a profound interest in learning to program, I have followed your Hands On column for several months. I have just one wish: how about a feature that introduces new programmers? I am utterly confused by all the different languages such as VB, C++, Java and Delphi. What are the differences between them and their applications? Which is the best programming tool for novices like me to start with?"

The easiest way to learn programming is to set yourself a small, manageable project and then get on and do it. A classic example is an address book, which will teach you about managing data as well as

Book reviews

■ The Java Programming Language

Author Ken Arnold and James Gosling

The bookshops are laden with titles such as "Learn Java in your Lunch Break" but if you have a little programming knowledge this one is a better choice. James Gosling created the original Java (then called Oak), so this is the authoritative guide.

In just 400 pages, and with a clear, accessible style, the authors explain the Java fundamentals: classes, interfaces, operators, threads, packages, and more. The book focuses on the core language and does not attempt to cover development tools nor specialised topics like JDBC data access, nor the Swing graphical components. This makes it useful whatever tool you happen to be using, by providing you with an understanding of how and why Java works as it does. This second edition is based on JDK 1.1. For anyone serious about learning Java, this is a great read.



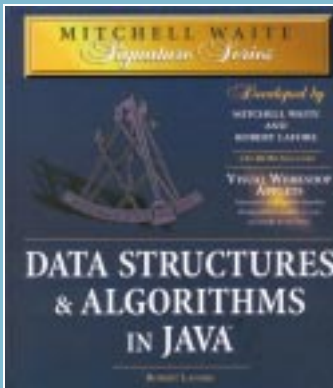
■ Data Structures and Algorithms in Java

Author Robert LaFore

Whether or not you think Java represents the future of computing, of one thing there is no doubt: it is the ideal teaching language, being elegant, modern, object-orientated, safe, and better still, cheap, since the official Java Development Kit is still a free download.

Robert LaFore's book is about the nuts and bolts of programming: sorting, searching and storing data. You learn about sort algorithms, linked lists, recursion, binary trees, hash tables and graphs, all implemented in Java. But do you need a book like this when anyone can snap together an application from pre-built components? In my opinion, yes, you do. These are exactly the topics that many tutorials on tools like Visual Basic and Delphi ignore but if you develop software of any complexity you will inevitably have to devise algorithms to solve the problems you encounter.

If you have any interest in efficient, fast, code then this title is for you. It is also the kind of stuff you need to know for computer science qualifications. The style is clear, the pace is good and the examples are easy to follow. If you want to be a real programmer, look no further.



constructing a user interface. In his classic book, *Programming Windows*, Charles Petzold remarked that he learned new languages by building a file viewer.

It is very hard to learn programming without some project in mind. If you have time, a great idea is to do the same project in several languages, so that you get a feel for how they compare.

All the tools and languages mentioned in Ian Smith's letter have their good points and I have summarised the main factors below. The best foundation for learning to program is Java but Visual Basic or Delphi is likely to be more useful to you in the short term. You do not need to spend much to get started, either.

Versions of all these languages are either freely available or offered in introductory "learning" editions for a modest cost.

Which language?

● **Java** If you want to learn the art of programming, Java is ideal. It will teach you object orientation, it is unlikely to crash your PC when you make a mistake, it runs on most computer platforms and it has a great future. Visit www.javasoft.com to download the latest Java development kit and to find the online Java tutorial.

The snag with Java is that for pure Windows development it is limited in both features and performance. It is more challenging for beginners than VB or Delphi, partly because it is loosely based on C++ and partly because the development tools are less mature.

● **C++** This is the worst choice for learning to program. It is complicated, it mixes procedural and object-orientated programming. Mistakes often cause crashes and its use is likely to gradually

decline. Having said that, Visual C++ is Microsoft's premier development tool for Windows. The main benefits are the most complete access to the features of Windows, and good performance.

There are C++ compilers for other platforms such as Unix and the Mac but typical Windows applications are full of functions which only exist in Windows, making it hard to transfer your code.

● **Visual Basic (VB)** The original Basic was designed for beginners and is the easiest language to learn. It is the macro language of Microsoft Office, and a scripting version is included with Internet Explorer, so most Windows machines end up with it installed somewhere. If you want to use pre-built components, VB is the best choice, and there are hundreds of add-ons available.

VB has become a powerful programming tool, but the ease of use disappears in large, complex projects and performance is usually worse than C++ or Delphi. It is not cross-platform, although IBM has a version of sorts for OS/2, and Microsoft Office runs on the Mac.

● **Delphi** Delphi is based on a language called Pascal, much modified by Borland (now known as Inprise). I recommend Delphi as the best Windows development tool because it combines the power of C++ with the ease of VB.

Having said that, VB is more useful in that the same language can be used for application development, Excel macros and internet scripting. Like C++, Delphi combines object-orientated and procedural techniques. Delphi applications only run on Windows. It is a little harder to learn than VB, although the tables are turned once you get beyond the beginner level.

PCW Contacts

Tim Anderson welcomes your Visual Programming tips and queries. He can be contacted c/o the PCW editorial office (address, p10) or at visual@pcw.co.uk.

VideoSoft Active controls
ElasticLight £41.12 (£35 ex VAT)
VS-OCX £116.33 (£99 ex VAT)
From Contemporary Software 01344 873434
www.contemporary.co.uk

Books
The Java Programming Language
by Ken Arnold and James Gosling
£27.95. Addison-Wesley. ISBN 0-201-31006-6
Data Structures and Algorithms in Java
by Robert Lafore
£46.95 (book and CD). Waite Group.
ISBN 1-57169-095-6.



A new flame

Bob Walder reports on his visit to the Networld+Interop show in Las Vegas where security products were all the rage, with network security do-it-alls and new versions of firewalls.

I have just returned from the Networld+Interop show in Las Vegas, where one of the most common recurring themes was security. Every other stand at the show seemed to sport some kind of security product, aimed either at keeping intruders out, or telling you all about what an intruder is up to once he has got in to your system.

Today, even the smallest company is connecting one or more PCs to the internet for browsing and email, and so needs to be aware of the implications of opening up its sensitive business data to the unwelcome attentions of strangers. So, the abundance of security-related products is hardly surprising, given the popularity of the net, and security is a subject which I intend to cover in more detail in future columns.

Flame throwers

A number of companies announced new versions of their firewall products, including the likes of Checkpoint and WatchGuard. Other vendors more renowned for their hardware expertise, such as Matrox and Bay ,were extolling the security features in their latest products.

Some companies, like Abirnet, are already saying that firewalls are redundant. Abirnet produces SessionWall, a network monitoring and blocking tool providing the ability to monitor your TCP/IP traffic across the full range of protocols: HTTP, FTP, SMTP, POP3, UDP etc. You can selectively ignore, report, log, alert or even block traffic, depending on combinations of the source and destination addresses, protocol and contents of the data packet.

According to Abirnet's Kurt Ziegler, firewalls only provide a defence at your "front door", doing nothing to protect you



from internal attacks (which make up 80 percent of all hacking incidents). Tools like SessionWall, though, provide a constant vigil against internal *and* external attacks, and thus a more effective overall defence.

Although I take Kurt's point to a certain extent, I do not foresee the end of the firewall just yet. After all, take house security: it is one thing having security

cameras at home so you can identify a burglar; but surely it is a wise precaution to lock the front door, too? In effect, I think most companies will want to use firewalls *in conjunction* with security monitoring tools such as SessionWall and ISS RealSecure to provide a true belt-and-braces approach to network security.

As firewalls move from the category of

“propeller-head” to “commodity”, the smart vendors are already recognising the need to further differentiate their products. This is achieved by layering additional services on top of the firewall, so that critical processes which are best performed at the corporate gateway to the internet, such as virus scanning or bandwidth control, can be executed by the firewall box. According to Checkpoint, the customer wants tight integration of all security and traffic control components, together with policy-based management for all business.

Two of the most crucial services being developed by savvy firewall vendors include directory services support and bandwidth control. Checkpoint's FireWall-1 is one of the first firewalls to offer integrated LDAP support with the release of version 4.0, announced at the show. This simplifies user management within security policies, as it allows FireWall-1 to share user and group repositories already established within an organisation.

General management and ease of configuration is also improved by virtue of the new Java-based GUI for defining and managing user-level security information and flashy new Security Wizards to guide the inexperienced administrator through the process of defining a security policy which does not incorporate glaring holes.

Checkpoint Charlie

Taking a step towards the day when we can use a single console to manage all our security devices, Checkpoint's Open Security Manager now allows the administrator to define, manage and distribute security policies for a range of third-party security devices such as Cisco PIX, Microsoft Steelhead, and routers from Bay Networks, Cisco and 3Com.

For those wanting to move beyond simply connecting their network to the internet and into the realms of providing secure inter-site links across an otherwise insecure network, then FireWall-1 4.0 also provides some smart new VPN (Virtual Private Network) facilities. Both the firewall itself and the standalone remote client (SecuRemote 4.0) support a Public Key Infrastructure (PKI) as part of an overall enterprise security implementation. This makes use of X.509 digital certificates and Certificate Authority (CA) technology from



Abirnet claims that firewalls are redundant and that SessionWall provides a constant vigil against internal and external attacks



Entrust to simplify and automate critical VPN functions like adding and deleting users, managing encryption keys and providing encryption key backup/recovery.

Rising from the Chrysalis

That other great bugbear of encryption applications, performance (or lack thereof) has been addressed through a partnership with Chrysalis-ITS. The Chrysalis plug-and-play PCI card offers hardware-based DES and Triple-DES encryption, allowing firms to deploy VPNs at Fast Ethernet speeds without performance degradation. These cards generate and store private encryption keys on the card itself, guaranteeing the privacy of all communications to and from the FireWall-1 gateway.

Be on your WatchGuard

WatchGuard Technologies launched its new baby at the show. Called Firebox II, this is a complete turnkey hardware and software solution which WatchGuard has christened a “network security appliance”. It is an attempt to place the Firebox alongside the fridge or microwave in terms of plug-and-play and in truth it is not far off that ideal, at least in terms of installation.

As ever, defining an effective security policy is anything but trivial in terms of the amount of thought required, but at least the



WatchGuard Technologies' new baby, Firebox II, is an attempt to place the Firebox alongside the fridge or microwave in terms of plug-and-play

internally, and Network Address Translation (NAT) to hide your internal network structure from prying eyes. The beauty of the

means of getting that security policy into the Firebox is made as straightforward as possible. And once it is there, WatchGuard provides an excellent range of graphical tools to monitor and report on activity through the firewall.

For those organisations which have multiple sites, or which provide managed services across the internet (such as ISPs), the Firebox provides a Global Security Manager through which an administrator can initialise, configure, manage and update multiple Fireboxes. Dual-image flash memory allows an administrator to download a new policy, monitor it to test its effectiveness and immediately revert to the former policy should anything prove unsatisfactory. For those wanting to provide secure links between sites, Firebox also includes IPSec VPN as standard.

Hitting the iSwitch

On the hardware front, both Matrox and Bay had something new to offer. Matrox was announcing its Fast iSwitch product, designed to provide high-performance switching, internet access, firewall, DMZ (De-Militarised Zone) and management software in a single, diminutive unit ideal for the smaller office environment.

This device features two, four or eight 10/100 auto-negotiated ethernet ports allowing it to be connected to the internal network, either directly to power users or servers, or to existing hubs or switches. External communications are provided by two enhanced serial ports for modems or ISDN terminal adapters, which are then available to all network devices attached to the iSwitch. The Fast iSwitch also performs bandwidth augmentation between the two serial devices, providing double the bandwidth when required.

Firewall is pretty basic, but provides a DMZ facility to host web and FTP servers

iSwitch is that it allows a low-cost means of connecting an existing LAN, or group of standalone PCs, to the internet without the need for a dedicated server or router.

The Bay area

Bay's Extranet Switch takes a slightly different tack but is still aimed at small to medium-sized enterprises wanting to create secure extranets and personal VPNs (Virtual Private Networks) across the net. The model launched at the show was the Extranet Switch 1000, aimed at businesses with up to 50 simultaneous remote users and priced at \$7,000 (UK price to follow).

Since Bay considers that the traditional remote access infrastructure is fraught with problems (long-distance phone calls for users, managing high fan-out of WAN connections at head office, etc.) the Extranet is designed to provide secure remote access across the net for up to 50 roving employees (up to 2,000 users with the Extranet Switch 4000) using a single box.

Directory enquiries

Directory Enabled Networking facilities allow authentication, performance levels, type of access and level of security to be defined on a per-user basis, with user information gleaned from existing corporate directories such as LDAP, RADIUS or NDS. The 1000 is designed to process VPN tunnels and perform encryption, and puts a filter on all 50 users simultaneously. Internal and external bandwidth management mechanisms ensure that the highest-priority users receive the best performance.

Tunnelling standards supported include IPSEC, PPTP, L2F and the new L2TP standard, while authentication can be performed against a variety of external servers including LDAP, RADIUS, Windows NT (with Active Directory to come), NetWare NDS, Security Dynamics or AXENT.

Encryption support includes RC4, DES and Triple-DES.

The Network+Interop show attracted around 60,000 visitors over three days, so while it is not in the same league as Comdex or Cebit it is well worth attending if you want to get an indication of how the networking market is moving a few months before it all starts to happen here.

More answers than questions: readers write about splitter cards

This month's Q&A section is all answers! I have had several responses from readers about the splitter cards mentioned by Dr Evans (PCW June). He was asking if a splitter card would be a viable option to purchasing and networking an additional PC to provide access to programs and data for two employees.

David Waller writes: "I have used such a device, called Sharedware. It consists of an ISA card and a module which allows a second keyboard, mouse and monitor to be connected to a computer running Windows 95. It makes use of 95's multitasking capabilities to allow both employees to use the computer independently, and the user profiles allow the various people to have individual desktops, as if using a network.

"I first tested it on an older and slower 100MHz Pentium with a dial-up modem connection to our internet provider, as I felt that this would be one of the main uses of Sharedware in a school situation. With one account, one modem but two independent users, the cost of purchasing Sharedware was recouped with just one application!

"It worked perfectly. The users of the host and client machines could independently surf the net. It was difficult to make any quantitative conclusions on the speed deterioration because of the many variables involved, but the users did not seem to be waiting much longer than usual.

"I then tested it on a networked computer with an AMD K6 processor and 32Mb of RAM. The two users could independently log in to our Novell 3.12 network and access the software on the local machine, and the files in their home directories on the file server.

"The speed deterioration of the processing was as you would expect with any multitasking operations in Windows 95. If both users were using Word or Excel, there was no noticeable difference; but with graphics applications and DTP, there was

Idiot proof: NetWare Connect

How big an idiot am I (answers on a postcard, please...)? In the July column, I published a request for information about modem-sharing products for NetWare. I was racking my brains so hard trying to think of third-party products that would do the job, that I completely overlooked Novell's own offering, NetWare Connect.

Karl Dyson, among others, wrote in to point out the error of my ways: "There is a product available from Novell, called NetWare Connect, which allows you to share modems via a 'client' that effectively redirects any of your local COM ports to server-shared modems. It uses the NetWare security to allow different users different access times and levels, and can support both dial-in and dial-out. There are 32-bit clients for Windows 95, and 16-bit clients available for both DOS and Windows 3.1x, so this should answer Peter's [Peter Williams] problem.

"NetWare Connect also supports as many modems as you can fit in the server, within reason. You can plug modems into the server's standard COM ports, or purchase something like a DigiBoard — supporting four or eight modems per card, and taking the COM-port processing away from the server CPU. It runs as an NLM and is therefore configurable from a remote console as well.

"There should be something about it on the Novell site. Try www.novell.com/catalog, there is an entry for NetWare Connect 2."

(as expected). This is again a subjective conclusion, as no timings were taken.

"The price of the package is £200 but a workstation bundle is now available for £300 which includes Sharedware, monitor, keyboard and mouse, with a 30-day money-back guarantee. In conclusion, I can only say that Sharedware delivers what it promises, allowing two users to access the same computer with minimum hassle."

A slightly different viewpoint came from Andrew Pickup: "I am head of IT in a preparatory school and we recently became connected, via a modem, to the internet. By chance I was sent a brochure about one of these splitters and so we bought it: £300 for card, mouse, keyboard and monitor.

"I believe the idea behind it is that a computer is only usually called on to use a fraction of its processing power. Theoretically, then, this power can be shared effectively to run two different 'computers' from one machine.

"There were some problems at first: the keyboard and mouse were poor quality, so both were replaced. The card kept trashing the computer and one day the hard disk was reformatted three times in an attempt to provide a 'clean' installation. Eventually one of the card's designers visited and declared that it was incompatible with the sound-card driver. Since then, with no sound card, it has worked fine.

"We are glad we bought it. It has provided double the internet use for the same phone charge, with no perceptible loss of speed, although there have been a few little quirks

regarding the order of connection, the sending of emails, etc. It certainly runs the database effectively and two concurrent searches are just as quick as when only one person is using the database. A pupil using CorelDraw on one monitor happily co-exists with another who is browsing the net, and there is no problem with printing. There are crashes, perhaps once a day, but the machines are used

intensively so it's not surprising. By the way, the computer is a K6 with 64Mb memory, but it did run with 32Mb.

"My advice to Dr Evans, though, would be similar to yours: buy another PC. If Access works OK on the machine he has at present, he could easily network the two using a crossover cable. A new computer and network cards would only cost twice as much as a splitter and monitor.

"Bearing in mind the importance of the information, I would not risk a splitter. After all, it doesn't really matter if my machine crashes, but we would not use one for our office administration. Dr Evans could get a nice setup for another £800."

So, anyone looking for a definitive answer will be disappointed yet again (isn't that just like a consultant?). However, as you can see, the splitter device is clearly suitable in certain circumstances, while for business-critical situations I would still recommend purchasing and networking a second PC if the budget will stretch to it.

My thanks to both David and Andrew for taking the trouble to write in about this.

PCW Contacts

Bob Walder can be contacted via the PCW editorial office (address, p10) or by email at networks@pcw.co.uk.

Abirnet www.abirnet.com

Bay Networks www.baynetworks.com

Checkpoint www.checkpoint.com

Matrox www.matrox.com

Sharedware www.sharedware.com

WatchGuard Technologies www.watchguard.com

Win a Visioneer PaperPort scanner!

With a fantastic Visioneer scanner, the PaperPort could be your paper mate. Or put some pep into your pics with Deluxe 5.1 or ProOCR 100 image editing software for Windows and Mac.

Visioneer has just launched its new PaperPort 6000A scanner. To celebrate, Visioneer would like to give two of them away, along with two copies of PaperPort Deluxe 5.1 software and two copies of ProOCR 100.

Two readers can win the first-prize PaperPort 6000A, worth £149. This scanner offers high image quality of 30-bit for colour and 10-bit for greyscale, resulting in over 1 billion colours and 1,024 shades of grey. For easy installation to the Windows 95/NT environment, the PaperPort 6000A features a pass-through parallel port. This ensures connections directly to the parallel port with other parallel devices, such as external storage drives and printers.

● Four runners-up will win either a copy of PaperPort Deluxe 5.1 or Pro OCR 100 software. PaperPort Deluxe 5.1, worth £79, offers the user a new, more complete solution for Windows and Mac platforms. The new Windows software is optimised




for colour images with new colour enhancement tools to improve images and colour photos, and

supports almost every scanner, multi-function device and digital camera on the market.

Visioneer ProOCR 100, worth £59, allows the user to scan formatted documents such as multi-column magazine and newspaper articles, dot matrix, faxed copies and spreadsheet tables, and convert them accurately into editable text.

For a chance to win in this competition, mark a postcard "PCW/Visioneer Comp" and send it to the address above below.



Rules of entry

This competition is open to readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications and Visioneer. 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.

How to enter the competition

1. Via our 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. Mark your card "PCW/Visioneer Comp" and send it to: P.O. Box 191, Woking, Surrey GU21 1FT. Entries must arrive by Friday 28th August 1998.

• Please state clearly on your entry if you do not wish to receive promotional material from other companies.

Incoming



The steadily increasing sightings of UFOs at the beginning of the 21st century were of little interest to Earth's governments. But when they attacked the international moonbase in 2008, it was clear the aliens had intentions other than observation.

Incoming's action takes place over ten locations, from Kenya to California, including stop-offs at the moonbase and the alien home planet in the Crab Nebula.

Allied defence forces consist of helicopters, bombers and fighters, along with ground cannons, tanks and captured alien craft. You take control of one craft per mission and

combine basic strategy with plenty of mindless blasting. Instant playability and



fabulous graphics are vital in a game like this and Incoming delivers both, in spades. The detailed 3D landscapes look superb, as do the battling craft and military installations. But it's the explosions that

really impress: digitised fireballs are combined with ILM-style concentric ring

shockwaves that drive you to destroy more aliens. The guided missiles with convincing smoke trails are particularly satisfying.

Incoming requires a 3D hardware accelerator and is designed to support AGP and PII, but it ran beautifully on a Pentium 200MMX with a PCI ATi Xpert@Play, under DirectX 5. It sounds great, looks superb, plays well and is extremely addictive.

Gordon Laing

PCW Details

Price £39.99

Contact Rage Software 0151 933 2688

www.rage.co.uk

System Requirements Windows 95, DirectX 5, 4Mb 3D accelerator, Pentium 133MHz, 16Mb RAM, 50Mb disk, 2X CD-ROM drive

★★★★★

Titanic: Adventure out of time

Who is Georgia? And why must you tell nobody that you are going to meet her on deck? Why does PP need to meet you beside the electric camel immediately? Come to that, what exactly is an electric camel?

So many questions and so few answers; but then, if you knew it all to start with, it wouldn't be much of a game. Using beautifully rendered backgrounds, so faithful to the original that you could believe you were on the set of the recent film, this mystery game opens in the middle of WWII before



you find yourself flung back 30 years in time, into a cabin of the doomed liner. Smethells, your steward, is banging furiously on your door, and with little to go on, it is your task to work out what is happening.

The truth of the matter is that the

Rubaiyat of Oman Khryan has been stolen. Bought only two months ago in Paris, the Bureau Secret Service believes it to have been taken by Zeitel, a German colonel travelling under the premise that he is on his way to inspect his country's embassies overseas. Your director, of course, knows better. It's your job — and you have little choice whether you accept it or not — to find the book. Success could save millions of lives. Failure could throw the whole world into more turmoil than your fellow passengers could ever imagine.

Nik Rawlinson

PCW Details

Price £19.99

Contact Europress 01625 855000

www.europress.co.uk

System Requirements 486/66 PC or faster (Pentium recommended), Win95 or 3.1, 8Mb RAM (16Mb recommended), SVGA video card, Windows-compatible sound card, 2X CD-ROM.

★★★★☆

Motorhead

If you think the lighting in Ikea is futuristic, then you haven't played Motorhead. With a car far better than anything I (or probably you, too, come to that) have ever had the chance to drive, you'll find yourself touching 285km/h or more, smashing into your opponents and screaming around corners.

At the start of the game you are a nobody; an anonymous competitor. The teams do not yet know your abilities so



your choice of cars is limited. Prove yourself, though, and demonstrate your skill, and you'll soon find yourself gaining respect, ranking, and a better choice of vehicles.

With all six tracks of the Transatlantic Speed League to race, this is one game that will keep you

hooked for weeks. Set the controls for automated braking and gear-changing and you'll have to think of nothing but the road ahead. The screech of hot tyres on the tarmac, the sulphurous glow of the overhead lighting on your windscreen, and the ultimate need for complete concentration make this one of the most realistic and satisfying driving simulations around.

Nik Rawlinson

PCW Details

Price £29.99

Contact Gremlin Interactive 0114 279 9020
www.gremlin.co.uk

System Requirements Windows 95, P90, 16Mb RAM, 100Mb hard-drive space, 4X CD-ROM.

★★★★☆

Plane Crazy

For most PC gamers, the idea of a Mario Kart-style 3D racer, full of wacky opponents and absurd power-ups, is something only their console cousins have had the pleasure of experiencing. With the release of Plane Crazy: Uncivil Aviation, that is about to change. The player takes control of a pint-sized aeroplane and has to race through five different courses in either quick race, ghost

race or championship mode. The action throughout is based as much on the use of power-ups (including speed-ups) and shortcuts as it is on flying abilities. This is not a flight simulator! There may be only five



courses from which to choose, but they are all markedly different and feature numerous checkpoints. The raceways themselves follow the current trend of including

multiple routes and shortcuts, some of which can only be accessed using your plane's firepower. The other planes provide tough yet competitive opposition.

Championship mode allows you to win money to upgrade your plane's flight capabilities, although network play perhaps provides the most fun. You really do need a fast PC to appreciate some of the game's finer graphical points. Still, it's great fun and makes a change from the typical PC game.

Andrew Robertson

PCW Details

Price £29.99

Contact Europress 01625 855000
www.europress.co.uk

System Requirements P166 (P200 MMX rec), Windows 95, 16Mb RAM (32Mb rec), 35Mb hard-drive space (85Mb rec), 4X CD-ROM, DirectSound-compatible sound card, 2Mb SVGA graphics card (4Mb or better Direct3D-compatible 3D accelerator rec).

★★★★☆

Hercules



Never mind what you *think* is your favourite game. Buy this one, play it, and be safe in the knowledge that Hercules will be the one. This is, quite simply, a stunningly good game. It goes right back to the early days of platform games and gives you a linear course on which to play. You are the great man himself, and as the hugely entertaining opening sequence (that had us captivated for a full 15 minutes) will explain, it is your



Park look like kiwis. The trademark Disney humour is present throughout, while the 3D animation and spectacular soundtrack will put you right inside the game, living it — not just on the outside, controlling it. If you have always believed that the PC is for work and not for games, you may find yourself having to re-evaluate your position after just an hour in control of Hercules.

Nik Rawlinson



task to stop the universe and everything in it from falling under the spell of the evil Hades when the planets align in 18 years' time. To help you in your quest, your vertically-challenged guide, Phil, will train you with the aid of stuffed damsels, feisty leaping fish, and birds so fierce they could make the raptors of Jurassic

PCW Details

Price £39.99

Contact Disney Interactive 0181 222 1571
www.disney.co.uk

System Requirements P90, Windows 95, 16Mb RAM, 57Mb free HD space, 4X CD-ROM drive, Windows-compatible sound and graphics cards (joystick or gamepad recommended).

★★★★★

Hocus Pocus Pink

You play the Pink Panther, a travelling book salesman who tries to flog his wares at the spooky-looking Periowinkle mansion. The mansion happens to be home to the Strange-blood Academy, a teaching school for wannabe warlocks and wizards.

As the cartoon sequence that starts the game shows, you arrive at the mansion to see one rather over-zealous and under-talented warlock transform a little girl into a wombat. It's up to you to scour the world for the potion that can save her from a hairy fate. You find your way around by clicking on objects and people,



asking questions and begging favours where you can, solving puzzles a-plenty, and learning magic tricks.

The Book of Knowledge is one of the best things about the game. It is an interactive



encyclopaedia about the five countries you must visit, with information, pictures and history on religions, geography and

cultures, all perfect for curious nine year-olds. And while it may be aimed at young minds, the game nevertheless offers something to everyone.

Paul Trueman

● We are giving away a copy of Hocus Pocus to the senders of the first five postcards to reach us here at Screenplay (PCW address, p10).

PCW Details

Price (£19.99)

Contact Anglia Multimedia 0500 600191
www.anglia.co.uk

System Requirements Win95, P100, 4X CD-ROM, SVGA card, DirectX-compatible graphics card

★★★★☆

Brainteasers

Quickie

The number four is the only number which contains as many letters as the number itself. Can you find a different but unique property about the number 40?

This Month's Prize Puzzle

This month's puzzle, we suspect, is one of the most difficult we have ever set. But don't worry, it will be no easier for a first-class mathematician than for anyone else. It just needs a good programmer!

Using 18 digits (two 1s, two 2s, two 3s etc. up to two 9s) generate a 3 x 3 grid with the cells containing nine different 2-digit numbers, eight of which are primes, and the other a perfect square. In addition:

- Each of the three rows and first two columns contain six different digits. One digit appears twice in the rightmost column.
- The three row totals have the same values as the three column totals, but not necessarily in the same order.
- The total of the SW to NE diagonal values is the same as one of the row totals. The other diagonal total (NW to SE) differs from this by two.

Write your 3 x 3 grid on a postcard or the back of an empty, sealed envelope and send it to: PCW Prize Puzzle - September '98, P.O. Box 99, Harrogate HG2 0XJ, to arrive no later than 20th September, 1998. *Do not send solutions on floppy disks, emails, or in envelopes.*

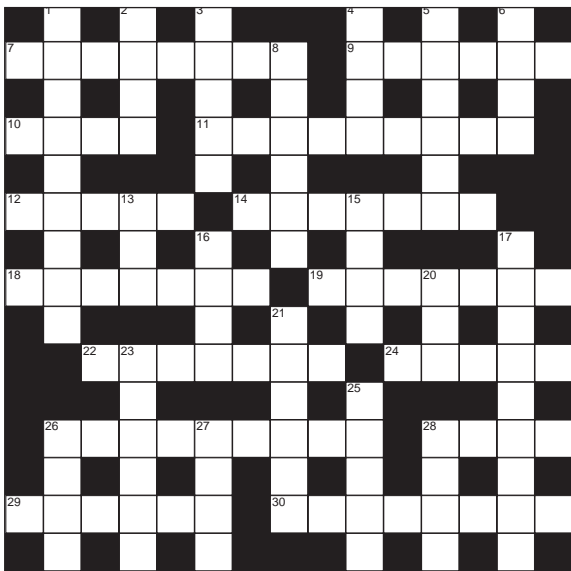
Winner of June's Prize Puzzle

Several entrants sent multiple solutions to our number base problem, which usually means that the puzzle was loosely worded. So, we checked the wording and it did say that each letter represents a different numerical digit (not *digits*), so unless we're missing something, only one solution is possible: **16503 base 8 = 30561 base 7**

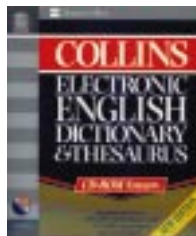
In case the senders of multiple solutions are worried, as long as you sent in the above solution your entry was deemed correct. The winner is John Stockton, of New Malden. Congratulations, John, your prize is on its way. As for all the also-rans, keep trying — it could be your turn next.

JJ Clessa

Prize Crossword No. 11



Are you crossword crazy? Would you like a copy of the



Collins Electronic Dictionary & Thesaurus? Each month, one lucky PCW crossword entrant wins one — this time, it could be you. Send your completed crossword to "PCW August Prize Crossword", VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive not later than 28th August, 1998. *Please state clearly on your entry if you do not wish to receive promotional material from other companies.*

- Sluggish (4)
- Rabbit burrows (6)
- Minus (4)
- Islamic place of worship (6)
- Big-headedness (3)
- Impartial (4)
- Celebrity (4)
- Jurassic beasts (9)
- Trophy (3)
- Flashes (6)
- Serviette (6)
- Fossil resin (5)
- Stagger (4)
- Possesses (4)
- Rice wine (4)

ACROSS

- Place at the station for a computer's basic system? (8)
- Put it on your machine when very wealthy! (6)
- Microbes and digital glitches (4)
- Personally coded entry protectors (9)
- Moving picture facility (5)
- Riding the breakers, digitally (7)
- Starts the computer up again (7)
- One of billions printed on boards (7)

- Put into indecipherable code (7)
- Process files sequentially (5)
- Do all the codes again (9)
- Capture the image digitally (4)
- The D of CAD (6)
- Sound output devices (8)

DOWN

- Lights up (9)
- _____ Redding, 1960s pop star (4)
- Red flower (5)

August Solutions ACROSS

- 7 Rewritable 8 Dump 9 Local bus
10 Screen 11 Eudora 13 Entered
15 Systems 17 Central 19 Optical
21 Neural 24 Savers 26 Resident
28 Boot 29 Fuzzy logic

DOWN

- 1 Remotely 2 Errand 3 Stub 4 Abuse
5 Less 6 Ampere 8 Darkest 12 Rumba
14 Niece 16 Trident 18 Atlantic 20 Pianos
22 Rodeos 23 Graze 25 Safe 27 Says

Going the distance

Borland Sprint is a fast DOS word processor that has done the ten-year dash with Simon Collin. Here, he tracks its history.

One of the oddities of growing old is that you don't always realise the speed at which familiar things are getting just as old. For example, I've been using a wonderful word-processing program for years and had never really noticed that it was old enough for a Retro column treatment until someone pointed out that perhaps I should upgrade my editor.

The truth is out: I still use a product that was developed back in 1989 — Borland Sprint. This MS-DOS word processor is still one of the fastest editors around with a great macro language and, thanks to some inspired thinking, a user interface that can be totally customised.

Sprint limps in

Sprint was launched with less of a whim than a whimper back in 1989. Borland was, at the time, a major independent developer that produced ground-breaking products including Sidekick and Turbo Pascal. It also developed a range of slightly odder products that did not make a naturally perfect fit with its mainstream offerings. These included the Sprint word processor and various keyboard macro and accelerator utilities.

Borland [now called Inprise] moved on to take on the dBase range of products and a wider range of programming languages. The company's founder, Philippe Kahn, left to set up Starfish, which bundles its Sidekick software with the nifty little PCMCIA-size Rolodex organiser and with the PalmPilot. This all makes good corporate sense, since Borland is now focused on programming and high-level database products and has left its other products behind.

Word play

Even if Sprint did not fit the product range it was a great word processor for the time, but launched just a year or two too late to get it into the main game. The market was dominated by WordStar and WordPerfect. The former provided a nice user interface with standard shortcut keystrokes. The latter provided good support for foreign

characters and a minimalist user interface. Both included simple macro functions that could let you record keystrokes and carry out basic text processing.

Sprint rushed into this market with a mass of novel features. If you were a lover of the minimalist WordPerfect screen, you could modify Sprint so that it looked just like WordPerfect. If you preferred to have an on-screen menu at the expense of screen real-estate, you could adapt Sprint to look the part. In addition to this



chameleon screen display, the keyboard and keystrokes could all be modified. Sprint included predefined keyboard mappings to mimic, you guessed it, WordPerfect and WordStar keystrokes (such as Ctrl-B and Ctrl-K to define a block of text).

For users who needed to work with program source code, which was a major proportion of the Borland customer base, Sprint also cleverly emulated the hugely popular Brief programmer's editor. Brief was, and still is, totally flexible and extensible. In fact, if Sprint had been promoted more as an editor rather than a word processor it might still be around today; like Brief, that is now available in a splendid Windows version.

But rather than compare Sprint to programming editors, we should stick to its intended market of word processors. Sprint had all the usual trappings of spell-check, fonts, timesteps and page preview. It scored highly with its ability to manage vast files. Where the WordStar version of the time gave up on files larger than 64Kb, only Sprint and WordPerfect could load and manipulate 200Kb text files. However, if you wanted to try this with WordPerfect you would need a convenient tea-break mid-load to while away the time it took.

Sprint used a virtual temporary file and loaded pages as required, so your 200Kb file would load in a flash. In fact, even on long documents, Sprint is faster than, say, Word 97 when opening files.

Following the script

The reason I still use Sprint is because of its powerful programming script. This is really a cut-down version of Pascal (not too surprising from the house that made Pascal popular) and allowed an intelligent user to turn Sprint into a full text-processing tool. In fact, I would say that the Sprint language has only recently been bettered for text processing by Word 97's VBA implementation.

At the time of Sprint, the only real rival for complex processing was either Perl or AWK; the latter has died quietly and Perl is rather complex for a simple macro. The entire package was rounded off with a neat file recovery feature that detected if Sprint or your computer (the former was the most likely) had crashed mid-session.

What is rather odd about Sprint is that although it was launched some time ago, I still see its distinctive white box crop up in the corners of dealer stores. If you want it, you can probably still get hold of a copy. I use Sprint for its range of macros that I have developed over the years to help pre-process manuscripts. I could move to Word, but why switch when I have a faster, customised word processor that runs on any computer that supports DOS? ■

Software

Fit or Twit?

A rap from the heart, three educational games and a breezily-named dog help kids keep healthy.

Fit or twit, produced by the British Heart Foundation, strikes the balance between a standard-issue educational video and an interactive game. The game only lasts for 15 minutes and is aimed at 10- to 13-year-olds.

The product has a Pythonesque feel to it, mixing video, animation and line drawing. At the outset, a beating heart kicks off a rap performed by children. This opening rap is a bit grisly for anyone older than the targeted audience and the lyrics pull no punches: "If the beat should stop, Your lips go blue, Then you drop, It's hospital for you" — it's enough to make even the most slothful among us reach for the exercise bike.



What is *really* good for your heart? Fit or Twit? has a quiz, some games and a dog called Faht

The CD is introduced and conducted by a dog called Faht. The quiz starts by asking you how many hairs or muscles there are in the human body. In fact, there are five million hairs and 650 muscles, but the point it wants to make is that you only have one heart.

There are three games: one where you have to guide Faht around town in search of healthy activities; another where you have to find hot-spots on a girl's body by guessing what harm smoking does; and a third that educates viewers about the importance of maintaining fat, fibre, salt and energy at the correct levels. Overall, a great educational source — and free at that.

Rachel Spooner



PCW Details

Price Free to schools.

Contact British Heart Foundation 0171 935 0185

System Requirements Windows 95, 120MHz processor or faster, 16Mb RAM, 8X CD-ROM drive.

★★★★★

The Really Wild Show

Learn natural history the fun way by playing games based on BBC Natural History Unit material.

"Remember," says Michaela Strachan "a legless beetle is a dead beetle!" Our testers needed no more persuasion from the presenter of the popular TV series to start playing Bombardier Beetle Bash, one of four games on the Really Wild Show CD-ROM. Your job is to aim deadly chemicals at passing ants, preventing them from pulling your "beetle" legs off. It's hardly new, but our testers were amused for hours.

As well as games, the program has reference material from the BBC's Natural History Unit.

It is not an animal encyclopaedia. The BBC has avoided search engines and alphabetical lists in favour of presenting everything in the context of a game.

The Nature Section has eight scenes that span the four climates. Contained within these are 50 hidden animals. Using a



magnifying glass to find them, you can read the accompanying fact file or watch a video clip on the species you've uncovered. There's a quiz, too: give the right answer and you can add the species to your ark. Once you have collected several animals, you can play Beast Blender. This muddles up your animal parts to create *really* wild-looking animals.

There is enough variety in this program for it to survive well beyond the novelty period. It requires fairly good navigation skills to find your way around, so is best suited to seven-year-olds and over.

Debbie Davis



Find the hidden animals, learn about them and then relax by making some imaginary wild beasts of your own

PCW Details

Price £24.99

Contact BBC Multimedia 0181 576 2945

System Requirements Windows 95, 120MHz processor or faster, 16Mb RAM, 8X CD-ROM drive.

★★★★★

The Human Body

Everything you ever wanted to know about your body, including how it works and general health.

The TV series, *The Human Body*, has not been long on our screens and already we have the CD-ROM. The memorable part about the series is its nifty camera work. But has this transferred successfully to CD?

The *Human Body* CD is divided into three sections. "Life-stages" is clearly based on the TV programme and follows the six stages of life, using narration and film footage from the series. Each life-stage is divided into several topics that you choose by clicking on a floating icon.

"Body Labs" is devoted to serious explanation of how the body works and is ideal for GCSE biology students. Information on the body's systems and processes is given in stages, each step supported by summary text on-screen, with animation and video with a voiceover. This mix of media does help to make it much easier to understand and retain complex information.



you've entered your lifestyle and personal details, it draws up a health plan for you. How useful it is, depends on how truthful you are. Our teenage testers, all computer enthusiasts, denied smoking and drinking. They claimed that they took daily exercise and avoided fatty or sugar-rich foods. Obviously, then, our stereotype must be wrong!

Debbie Davis



Above The beginning of life

Left Balance your diet the healthy way

The "You Watcher" section is the fun bit. It resembles a quiz from a teenage magazine. Once

PCW Details

Price £29.99

Contact BBC Multimedia 0181 576 2945

System Requirements P75 processor, 16Mb RAM, 16-bit SoundBlaster, Windows 95.

★★★★☆

Do3D

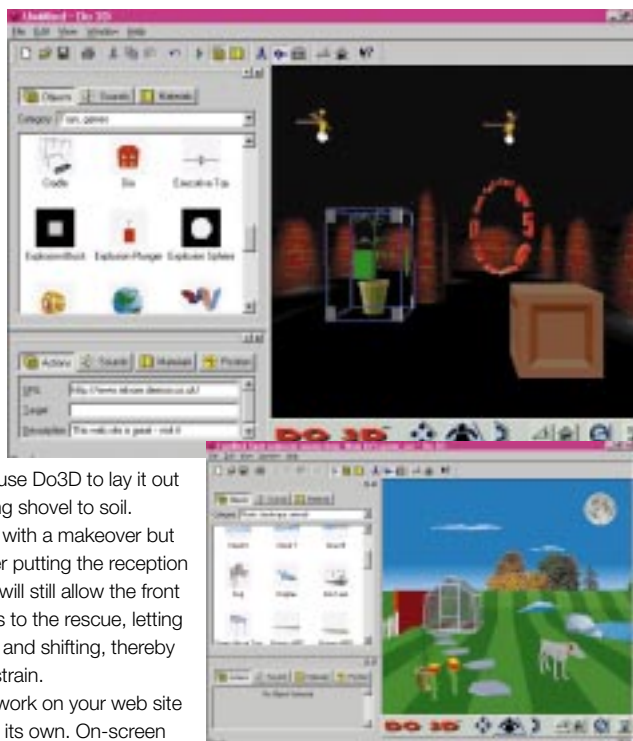
This 3D drag-and-drop design CD helps you decide what goes where in the worlds you create.

Does your web site have less depth than Flat Stanley? Do you want your users to be able to get into and around your creation? In the past, this meant complex programming and hours of trial-and-error tedium. Now, though, you can cut through the hard work with Do3D. It's a drag-and-drop 3D world-creation package.

Perhaps you want to design a new garden?

Mistakes can be costly, so use Do3D to lay it out on-screen before committing shovel to soil. Maybe your office could do with a makeover but you just don't know whether putting the reception desk over in that far corner will still allow the front door to open? Do3D comes to the rescue, letting your mouse do all the lifting and shifting, thereby saving you needless back-strain.

Putting the package to work on your web site is where it really comes into its own. On-screen



Inside or out, Do3D can design your new garden or jazz up your web site

objects can be linked to pages of your choice, or other sites altogether, so clicking on a swimming dolphin might take users to the webcam at Lincoln Park Zoo, while selecting a rotating ceiling fan might throw them in the direction of your inevitable "About Me" page.

Created worlds can be exported in the VRML 2.0 format for maximum compatibility with current web access software. For a demo version, look back to our July issue cover-mounted CD-ROM.

Nik Rawlinson

PCW Details

Price £39.9

Contact Anglia Multimedia 0500 600191
www.anglia.co.uk

System Requirements Windows 95, Pentium processor (PII rec.), 16Mb RAM (32Mb rec.), 30Mb free hard-disk space (1Gb rec.). Supports 3D graphics cards through DirectX 5.0.

★★★★☆

Thank you for the music

These music composition kits should (hopefully) bring out the artiste in you. Take it away!...

Following my previous (un)successful outing as a chart-topping digital musician, the editor has seen fit to let me loose on a whole range of mouse-based composition kits, a fairly decent set of speakers and an office full of writers to annoy with my less-than-tuneful efforts.

■ Rave eJay

The logical first step was Rave eJay, successor to Dance eJay (reviewed in *PCW*, July) and based around the same simple principle of dragging and dropping pre-recorded sound clips onto a virtual eight-track mixing score. All Rave eJay samples, and there are over a thousand from which to choose, are recorded at a speed of 180bpm in C-minor, which makes them easier to fit together than a one-piece jigsaw.

All samples are colour coded to make them easy to identify in a way that will separate, for instance, your bass samples from the effects and the sequences from your drums. Six of the eight tracks are mono, sending their output to both speakers simultaneously, while the remaining two serve just the left and right channels, allowing for some interesting special effects. Once your creative juices have run dry from working on the bundled samples, three add-on CDs will provide you with a host of new ambient, hard-core, and drum and bass snippets to add to your collection.

The Recording Box allows users to record their own samples in time to an electronic metronome inhabiting your PC's internal speaker. The newly created sample can then be dropped into your composition at the appropriate place.

Hyper active

The Hyper Generator, meanwhile, is a combined synthesiser and sequencer which makes it easy to create original samples and sounds electronically, without the use of a mike.

After two days of fiddling with the eight tracks of Rave eJay and still having produced nothing you are ever likely to hear on Radio 1 or Top of the Pops, I felt it was time to stretch my talents to the limit and tackle the joys of 16 tracks. Yes, it was time to move on to Mixman Studio...

■ Mixman Studio

Arriving in rather scary black packaging, this stylish software is based around a turntable interface and has one of the best instruction manuals ever to grace the *PCW* offices.



With a song in your heart: true-to-life graphics make Mixman Studio second nature

Grand finale

Despite the eJay web site detailing one user who received a 12in-single contract on the strength of his efforts, and considering that Mixman Studio is simple to use, great fun and capable of producing outstanding results, neither of these packages is likely to turn you into the next Gary Barlow. If, however, what you're after is a lot of fun and a great way to spend a rainy afternoon, then either one should suit you down to the ground.

Nik Rawlinson

Split into two sections, the first stop was the recording studio. Using the mike or the "line in" channel of your sound card, this is where you can create your own samples to include in the mixes you will make in the Mixing Studio.

Looking like a double turntable deck, this deceptively simple interface actually hides a wealth of functions enabling you to mix your creation with other samples, including those royalty-free clips from the likes of George Clinton, K-Klass and Skinny Puppy (available separately) and fine-tune the resulting mix. Each of the sample CDs contains a cut-down version of the mixing software.

Towards the end of the manual a series of well written, clearly illustrated and easy-to-follow tutorials guide you through the most common functions of the package to ensure that your creation is a success.

Alternatively, you could just load one of the 25 sample mixes included with the package to see how the experts did it themselves.

PCW Details

Rave eJay

Price £29.99 (£14.99 for add-on sample packs)

Contact Fasttrack Software
0800 056 1799 www.fasttrack.co.uk

System Requirements 486DX2 66 or better processor, Windows 95/NT 4.0, 16Mb RAM, 2X CD-ROM drive, 16-bit sound card.

★★★★★

Mixman Studio

Price £39.95 (£29.95 for add-on sound discs)

Contact Time and Space 01837 841100
www.mixman.com

System Requirements Windows 95, Pentium processor (MMX for optimal performance), 16Mb RAM (32Mb rec.), DirectX-compatible sound card, CD-ROM drive, 7Mb hard-drive space.

★★★★☆



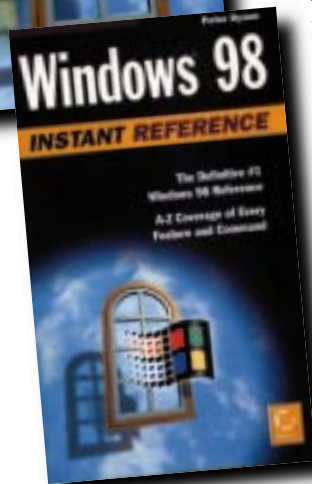
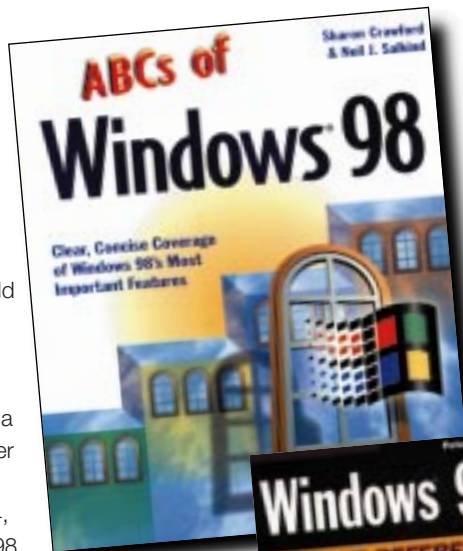
Books

Two timely tomes on Windows 98 hit and miss, the theory of multimedia, and a mind-blowing mystery tour of the human mind.

■ ABCs of Windows 98 Instant Reference

For those people still running Windows 95, whether you should upgrade to Windows 98 is a moot point. But anyone who buys a new computer after 25th June and doesn't fancy NT4, will get Windows 98 anyway. If you are looking for a simple guide to Windows 98, then *ABCs of Windows 98* is probably a good place to start. As the name suggests, it is a complete primer, with big print and lots of pictures — in other words, a book to baby you. It is well written, and if you are quite new to computing, or even if you are making the leap from 3.1 to 98, it will be a help. There are even a few useful hints in here for the more experienced user, although there will be insufficient substance to satisfy this group.

More unsatisfactory is *Windows 98 Instant Reference* book. If you want step-by-step help on how the dialog boxes work, then this is the one for you. But if, as I suspect, you're a bit beyond this kind of



hand-holding, or even if you know how to find the "Help" command on the Start menu, then this book is a sad waste of paper. It does not simplify matters for the first-time user, as it seems to presume a certain knowledge of Windows 95; neither does it carry sufficient detail to satisfy the power user.

A section at the front of the book on the new features and newly-supported hardware in 98, deals with multiple monitor support. But try to find out

what cards you can use, how to install multiple cards and monitors and then how to set it all up, and you will be disappointed. There is no help on this at all. However, I am sure you will be relieved to hear that there is half a page on minimising and maximising windows.

If you want the best book on Windows 98, grab a copy of the *Windows 98 Resource Kit*. It's not cheap (around £65) and it's not exactly light reading, but it does tell you all you need to know.

Adele Dyer

■ Theoretical Foundations of Multimedia

The preface of this book sets out its aims... "[It] is intended for anyone who has entered the exciting world of developing multimedia presentations or expects to do so in the future."

"Exciting" was not the first word that sprang to mind having first read it. The preface goes on to explain, though, that it "provides a theoretical foundation for the human communication and computer science principles that underline successful multimedia."

The key word here is "theoretical", for this book is not a how-to guide. It will not show you how to use PowerPoint or MacroMedia Flash.

When first flicking through the pages you may be impressed by the production; this is an attractive publication. Its contents deal, in a well thought out and illustrated way, with concepts such as applications of multimedia, roles of the computer, speakers and the "producer/director role". It even brings us right up to date with discussion of DVD technology and video on demand.

We were disappointed that some of the most potentially useful chapters of the book are far too US-centric. Snatching graphics, video and sound from the net is a common way of beefing up your presentation; but do you know where you stand legally? If you were expecting this volume to enlighten you, you will be disappointed, because the cases it cites and the laws it quotes are drawn from the far side of the Atlantic.

We also felt that even though the preface allowed for a wide brief, the actual scope of the book exceeded even that. Encompassing everything from dance and theatre to the noise pain threshold for humans, and Computer Science Fundamentals, data integrity, error

Top Ten Books

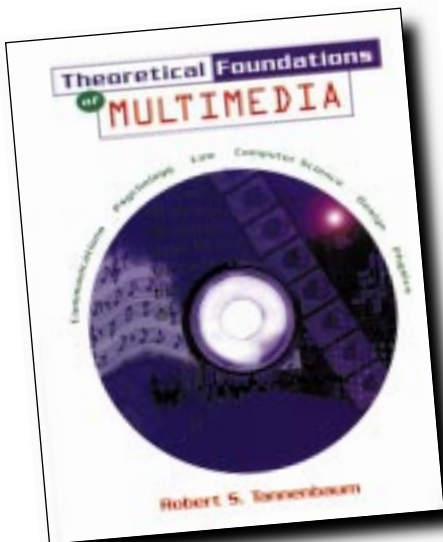
1. Internet and the World Wide Web: The Rough Guide	Rough Guides	£5.00
2. Using the Internet: 101 Essential Tips	Dorling-Kindersley	£3.99
3. MCSE NT Server 4 Exam Cram	Coriolis	£22.00
4. Being Digital	Coronet	£6.99
5. PCs for Dummies	Transworld	£18.99
6. Microsoft Office 97 for Windows for Dummies	IDG	£18.99
7. Internet for Dummies 4th Edition	IDG	£18.99
8. Webonomics	Penguin	£14.95
9. Excel for Dummies	Transworld	£14.99
10. Photoshop 4 for Macs	Peachpit	£17.99

■ List supplied by Waterstones

detection and correction, we had the distinct impression that the publishers had adopted a "cover all" approach in the hope that it might attract a wide audience.

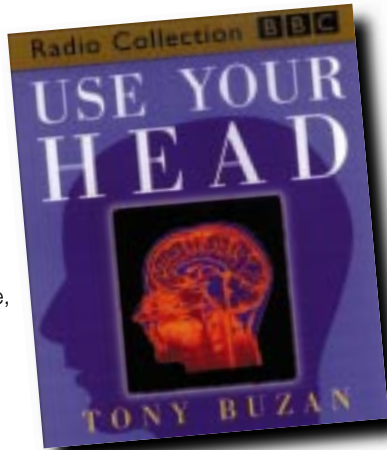
Overall, this is a well written and obviously thoroughly researched work, but it seems poorly targeted. Part physics, part computer science, part general knowledge, it could be applied to numerous university courses. Yet even though it is competitively priced and includes a CD-ROM (some of the contents of which we could not get to function), you would be well advised to borrow it from a library rather than buy a copy for yourself.

Nik Rawlinson



■ Use Your Head

This is the latest in a line of expand your mind-type self-help books and was originally written in the early seventies. The updated version, due out in August,



is presented essentially as a magical mystery tour of the human mind.

The author, Tony Buzan, tells the story of how at

school he could never achieve high marks in exams. One day, to his astonishment, the marks for a test on nature were given out and he was awarded a prize for being top student. He realised that the test had been about a subject in which he was interested and so, to his subconscious mind, it had not seemed like an exam. Thereafter, he delved further into the puzzling secrets of the mind.

The information in this book is extensive and if you stick with it I guarantee you will learn more than you bargained for. The author explains perplexing facts about the brain, the nature of perception, memory techniques, your IQ and a method of "mind-mapping".

This book, also available in cassette-tape format, is perfect either for students who might find it hard to revise for exams and assimilate a lot of information, or for those who would like to expand their mind.

The author's message throughout is that anyone can learn anything if they want to. It is all down to interest and motivation rather than knowledge and IQ. Apparently, the average brain contains a billion brain cells and each cell is far more powerful than a standard, modern PC. So why do we bother spending money on what we think is

sophisticated equipment when we have something far better between our ears?

Additionally, Buzan recommends many exercises for you to perform. These will help you understand how complex the mind is and also make you aware of the important role played by your eyes. He also stresses that exercise is good for the brain: "Healthy body, healthy mind". If you put Buzan's theories to the test, you could find yourself memorising pages from a phone book or becoming the brainiest person in the world. Well, okay, not quite. But it could encourage you to use your head more.

Etelka Clark

PCW Details

ABCs of Windows 98

Authors Sharon Crawford and Neil J Salkind

Publisher Sybex

ISBN 0-7821-1953-0

Price £18.99

★★★★★

Windows 98 Instant Reference

Author Peter Dyson

Publisher Sybex

ISBN 0-7821-2191-8

Price £13.99

★★★★★

Theoretical Foundations of Multimedia

Author Robert S Tannenbaum

Publisher WH Freeman

ISBN 0-7167-8321-5

Price £29.95

★★★★★

Use Your Head

Author Tony Buzan

Publisher BBC Radio Collection/Books

ISBN 0-5635-5743-5

Price Audio cassette £8.99. Book £6.99

★★★★★

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Entry-level PC: Watford Electronics Aries Perfecta K6 98

When we compared PCs using the AMD K6, the Cyrix 6x86MX and Intel's mew budget Celeron processor, systems fitted with the latter just didn't cut the mustard. If you must go Celeron, we recommend Watford's Aries Perfecta 6120, but otherwise, entry level PC shoppers should choose Watford's K6 machine.

PCW August 1998 p176.

Price £797.83
Contact Watford Electronics
01582 487777

Also

Recommended:
■ **Watford Electronics Aries Perfecta 6120** PCW August 1998 p176.

Price £821.33
Contact As above
■ **Panrix Lynx** PCW August 1998. **Price** £938.83. **Contact** Panrix 01132 444958



High-end notebook: Gateway Solo 9100

If you're looking for a notebook with all the features of your desktop, then the Solo 9100 from Gateway is your best bet. It has the latest 266MHz Mobile Pentium II chip, but also has 3D graphics, an optional DVD drive and a 14.1in screen, and comes complete with a 56K PC Card modem and MS Office SBE. We liked it so much, we gave it our Editor's Choice award.

PCW June 1998 p187.

Price £3,876.33
Contact Gateway 2000; 0800 282000



Also Recommended:
■ **Choice UltraLite Rodeo 5000** PCW May 1998 p144.
Price £3,876.33
Contact Choice Systems 0181 993 9003

Mid-range PC: Dan Dantium IIW5

This issue's £999 Pentium II group test showed that decent PCs had become extremely affordable. Take our Editor's Choice, the Dan Dantium II, featuring a Pentium II 266MHz processor, 6.4Gb disk, 64Mb RAM, AWE-64 sound, ATI Xpert@Work 3D graphics, 56K modem, decent monitor and good software bundle. A bargain mid-range PC.

PCW July 1998 p145

Price £1,175
Contact Dan 0181 830 1100
www.dan.co.uk

Also Recommended:
■ **Mesh Elite Professional PII** PCW July 1998 p157
Price £1,145
Contact Mesh 0181 452 1111
www.mesh.co.uk

■ **Viglen Contender II** (PCW July 1998 p159)
Price £1,175
Contact Viglen 0181 758 7000
www.viglen.co.uk



Mid-range notebook: Viglen Dossier M

This notebook has everything you need at a very reasonable price. It features the latest 266 Mobile Pentium II chip, a 4Gb hard disk and a 13.1in TFT LCD screen. It is also fitted with a whopping 149Mb RAM! We were particularly impressed by the high build quality.

PCW August 1998 p79.

Price £2,466.33
Contact Viglen 0181 758 7000

Also Recommended:
■ **Toshiba Satellite Pro 440CDT.** PCW March 1998.
Price £2,226.63.
Contact Toshiba 01932 828828



High-end PC: Viglen C2 Plus 400

PCs built around Intel's latest 400MHz Pentium II processor can certainly be described as "high-end". In September, we rounded up ten of them, and Viglen's C2 Plus 400 shone through, boasting great performance, superb configuration and impressive storage facilities. Following closely behind were Roldec and Elonex.

PCW September 1998 p155.

Price £2,349
Contact Viglen 0181 758 7000
www.viglen.co.uk

Also Recommended:
■ **Roldec Predator XL** PCW September 1998 p150.
Price £2,349
Contact Roldec 01902 456464
www.roldec.co.uk
■ **Elonex PTX-6400/i** PCW September 1998, p143
Price £2,203
Contact Elonex 0181 452 4444 www.elonex.co.uk



PDA HP 620LX

For cutting-edge technology in your pocket, Hewlett-Packard's 620LX has to be the only choice. It's based on the latest Windows CE2 operating system and is the first PDA we've seen with a colour screen. It's utterly gorgeous and, at

£799, a serious threat to many notebooks. PDA fans should also check out the Psion Series 5 and the 3Com PalmPilot. PCW May 1998 p262.

Price £799
Contact HP 0990 474747
www.hp.com



Colour inkjet: Hewlett-Packard DeskJet 890C

As all-round colour inkjet printers go, Hewlett-Packard's DeskJet 890C is hard to fault. Equally happy with photos or business graphics, it's our choice for the home or small office. Meanwhile, those on a budget should look no further than Canon's BJC-250, but those wanting the bigger picture will not be disappointed with HP's DeskJet 1120C A3. *PCW September 1998 p186.*

Price £317.25

Contact Hewlett-Packard
0990 474747 www.hp.com

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**Also Recommended**

■ Canon BJC-250
PCW September 1998, p185.

Price £116.33
Contact Canon 0121 680 8062
www.canon.co.uk

■ Hewlett-Packard DeskJet 1120C

PCW September 1998, p189
Price £446.50 Contact HP 0990 474747 www.hp.com

Budget laser printer: Panasonic KX-P6300

A decent laser printer at under £200 excluding VAT? That's Panasonic's KX-P6300, which not only turns out great results in fast time, but also boasts one of the smallest footprints of any printer. Its unusual vertical design, along with being a great-value all-rounder, earned it Editor's Choice in our last entry-level laser group test. *PCW February 1998 p194.*

Price £217.38

Contact Panasonic
0500 404041



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Also Recommended

■ Kyocera FS-600 *PCW February 1998 p189.* Price £280.83

Contact Kyocera 01734 311500

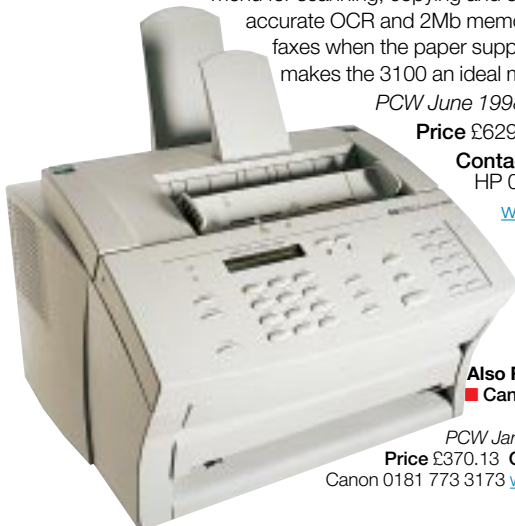
■ Minolta PagePro 6 *PCW February 1998 p192.*
Price £351.33 Contact Minolta 01908 200400

Multifunction device: HP LaserJet 3100

Good laser-print quality from this quiet machine. Intelligent enough to detect a document dropped into its feeder, 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, makes the 3100 an ideal multifunction device. *PCW June 1998 p83.*

Price £629

Contact
HP 0990 474747
www.hp.com

**Also Recommended**

■ Canon MultiPASS
MPC20

PCW January 1998 p78.

Price £370.13 Contact
Canon 0181 773 3173 www.canon.co.uk

Colour photo printer: Epson Stylus Photo 700

Colour inkjets have split into two categories, with this type clearly designed to reproduce the most realistic colour photographic prints. Epson has for a long time been the undisputed leader and its Stylus Photo 700 is our choice for inkjet photo printing. However, Lexmark comes very close behind with its 5700. *PCW September 1998, p188.*

Price £273

Contact Epson 01442 261144
www.epson.co.uk

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**Also Recommended**

■ Lexmark 5700
PCW September 1998, p188.

Price £229

Contact
Lexmark 01628
481500
www.lexmark.co.uk

Business laser printer: HP LaserJet 4000TN

King of the laser printers, Hewlett-Packard has impressed us yet again with its latest office machine. Being 25 percent faster than the LaserJet 5, with 10,000-page toner cartridge, two 250-sheet input trays, network interfaces as standard and boasting superb output, the 4000TN should be the first choice as an office workhorse. *PCW February 1998 p77.*

Price £1662.63

Contact HP 0990 474747

**Also Recommended**

■ QMS DeskLaser 1400P
PCW March 1998 p82.

Price £938.83

Contact QMS 01784 442255

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 older systems, or users wanting top performance, should stick to SCSI. *PCW September 1998, p229.*

Price £69.33

Contact
Umax 01344 871329
www.umax.co.uk

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**Also Recommended**

■ Agfa SnapScan 310P
PCW September 1998, p196.
Price £116.50

Contact Agfa 0181 231 4200
www.agfahome.com

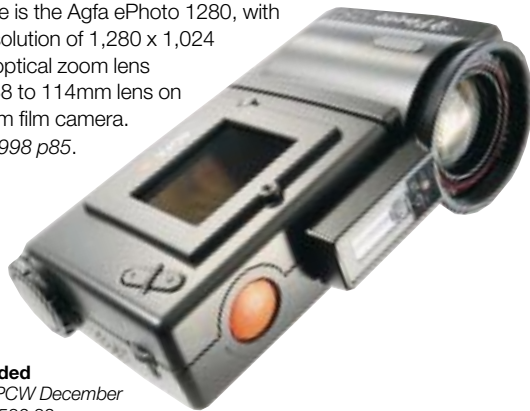
■ Microtek Phantom 330CX
PCW September 1998, p229.

Price £75.95
Contact Microtek 01908 317797
www.microtek.com

Digital camera: Agfa ePhoto 1280

Digital cameras have improved vastly over the last year and probably the greatest leap forward is in the introduction of mega-pixel cameras. The best of these is the Agfa ePhoto 1280, with its maximum resolution of 1,280 x 1,024 pixels and a 3x optical zoom lens equivalent to a 38 to 114mm lens on a standard 35mm film camera.
PCW February 1998 p85.

Price £650
Contact Agfa
0181 231 4906



Also Recommended

- **Kodak DC210** PCW December 1997 p82. **Price** £586.32
Contact Kodak 0800 281487
- **Sony DSC-F1** PCW January 1998 p221.
Price £457.07 **Contact** Sony 0990 424424

Monitor: Nokia Multigraph 447Za

No matter what you do, it's vital to get a good monitor with a clean, flicker-free display. In April 1998's group test we looked at 17in models and found Nokia's Multigraph 447Za to be the best in our entry-level category. Those with more to spend should check out the Mitsubishi, below, which won Editor's Choice in the high-end section.
PCW April 1998 p204.

Price £440.63
Contact Nokia
01793 512809



Also Recommended

- **Mitsubishi DiamondPro 700**
PCW April 1998 p208. **Price** £569.88
Contact Mitsubishi 01707 276100

Modem: BT Prologue K56EV Plus Modem

This smart little K56Flex modem features a headset, allowing it to be used as a hands-free telephone. Add a pair of speakers and you've got a full duplex speakerphone. The K56EV also supports AudioSpan Simultaneous Voice and Data (SVD) operation, allowing voice and data to be transmitted at the same time.
PCW July 1998 p80

Price £119.95
Contact Direct Source
0118 981 9960
www.btwebworld.com/tmd/



Also Recommended:
■ **Pace 56 Voice**
(PCW November 1997 p219)
Price £139
Contact PMC 0990 561001

Removable storage: SyQuest SparQ

With such differing capacities, interfaces and prices, there's no one removable storage device to satisfy all needs. As an overflow for your existing hard disk, the SyQuest SparQ is a clear winner, boasting excellent performance and low price. The external Iomega Zip Plus offers a good combination of ease of use and portability.
PCW August 1998 p116.

Price £169.99
Contact SyQuest
01189 880207



Also Recommended:

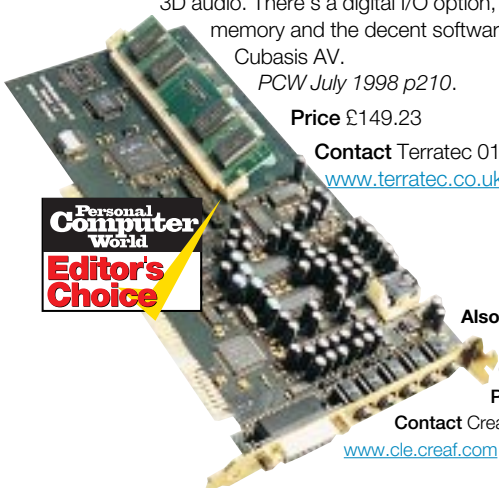
- **Iomega Zip Plus**
PCW August 1998 p116.
Price £143.83
Contact Iomega
07000 466342
Iomega Jaz 2Gb PCW August 1998 p116.
Price £441.71 **Contact** Iomega 07000 466342

Sound card: Terratec EWS64 S

A cut-down version of the heavyweight EWS64XL, Terratec's S model still boasts much of the same sampling and processing capabilities and is also a great games card with accelerated DirectSound and positional 3D audio. There's a digital I/O option, upgradeable sample memory and the decent software bundle includes Cubasis AV.
PCW July 1998 p210.

Price £149.23
Contact Terratec 01600 772111
www.terratec.co.uk

Also Recommended:
■ **Creative Labs AWE 64 Gold** (PCW July 1998)
Price £129.25
Contact Creative Labs 01245 265265,
www.cle.creaf.com

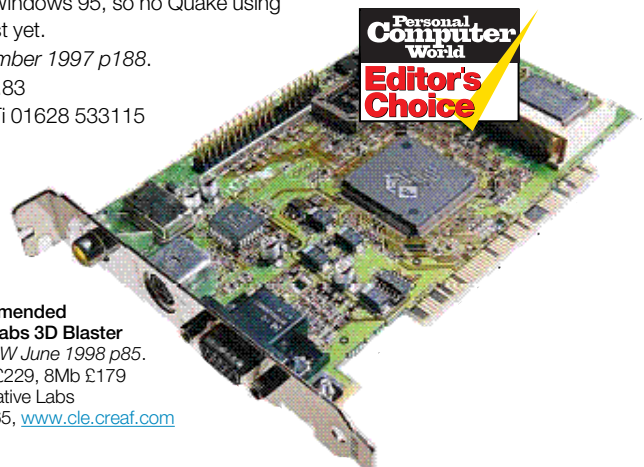


Graphics card: ATI Xpert@Play

For the best games performance you absolutely need a 3D graphics card. While the new 3DFX Voodoo 2 cards (see below) offer the best high-end performance, ATI's Xpert@Play card is a great entry-level choice. Note that at the time of writing, ATI only supplies Direct 3D drivers for Windows 95, so no Quake using OpenGL just yet.
PCW December 1997 p188.

Price £139.83
Contact ATI 01628 533115

Also Recommended
■ **Creative Labs 3D Blaster Voodoo2** PCW June 1998 p85.
Price 12Mb £229, 8Mb £179
Contact Creative Labs
01245 265265, www.cle.creaf.com



Accounting: MYOB

Ideal for the owner-manager and good for bookkeepers too, Mind Your Own Business (MYOB) is our choice for accountancy software. We also recommend TAS Books which offers good bookkeeping and very powerful analysis. *PCW June 1998 p198. Price* £229.13 **Contact** Bestware 01752 201901

Also Recommended ■ **TAS Books** *PCW June 1998 p203. Price* £116.33 **Contact** Megatech 01372 727274

**Personal Finance:**

Microsoft Money Financial Suite 98

Microsoft Money Financial Suite 98 is our choice for personal finance. It offers online banking and updating facilities, and Sage compatibility, at a bargain price. *PCW January 1998 p91. Price* £49.99

Contact Microsoft 0345 002000

Also Recommended ■ **Quicken 98**

PCW June 1998 p209 Price £39.99

Contact Intuit 0181 990 5500

**Database:** Borland Visual dBase 7

The first 32-bit version of Borland's classic database manager is a significant upgrade from version 5.5, and a must-have for dBase

developers so long as 16-bit compatibility is not required. Access is particularly good value when bought with Office 97 Pro. *PCW March 1998 p92 Price* £292.58

Contact Borland 01734 320022

Also Recommended ■ **Microsoft Access 97**

PCW October 1997 p196. Price £276.13

Contact Microsoft 0345 002000

**DTP:** Serif PagePlus 5

Inexpensive, easy to use and surprisingly well equipped.

PagePlus 5 offers extremely capable desktop publishing. Those wanting the choice of professional publishers will have to fork out more for Quark XPress 4.0. *PCW June 1998 p132. Price* £99.95 **Contact** Serif 0800 376 7070

Also Recommended

■ **Quark XPress 4** *PCW June 1998 p125.*

Price £1169 **Contact** Quark 01483 454397

**Image Editing:** Adobe Photoshop 5

With version 5, Photoshop is better than ever, although some web designers will want a little more. The legendary Paintshop Pro and fun PhotoDeluxe cater at entry level.

PCW June 1998 p88. Price £763.75.

Contact Adobe 0181 606 4001

Also Recommended ■ **Adobe PhotoDeluxe 2**, *PCW December 1997 p87. Price* £57.58

Contact Adobe 0181 606 4001 **Paintshop Pro 4** *PCW December 1997 p212. Price* £58.69

Contact Digital Workshop 01295 258335

**Drawing:** CorelDraw 8

Not one of Corel's classic years, but still the Windows drawing package to own. Version 8 of the giant suite boasts better drawing and new interactive tools.

Budget drawers should check out the Micrografx Windows Draw 6.

PCW January 1998 p88. Price £464.13

Contact Corel 0800 973189

Also Recommended ■ **Windows Draw 6** *PCW December 1997 p89.*

Price £49.95 **Contact** Micrografx 01483 747526

**Information managers:** Starfish Sidekick 98

The best personal information manager boasts wide customisability as its greatest strength.

For heavyweight contact management, look no further than Goldmine 4 (*details below*).

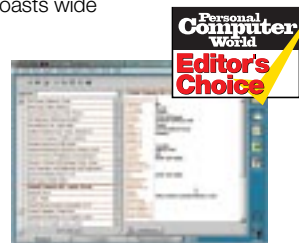
PCW August 1998 p204. Price £39.99

Contact Starfish 0181 875 4455

Also Recommended

■ **Goldmine 4** *PCW August 98 p173.*

Price £229.13 **Contact** AVG 0171 335 2222

**Presentation graphics:** Lotus Freelance 97

Our choice for electronic presentations. It may also come down to which office suite you own or are considering. As part of Microsoft Office 97, PowerPoint won't let you down. *PCW March 1998 p200.*

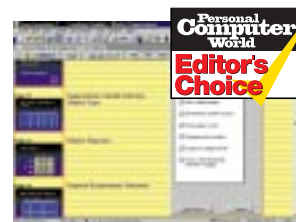
Price £49.35 **Contact** Lotus 01784

445808

Also Recommended ■ **MS PowerPoint**

97, *PCW March 1998 p202. Price*

£325.47 **Contact** Microsoft 0345 002000

**Programming tool:** Symantec Visual Café 2

Visual Café 2 is the most productive visual Java tool and has the option of native-code compilation for Windows. Windows

developers should go for Borland Delphi 3 which, although more complex, comes into its own on larger applications.

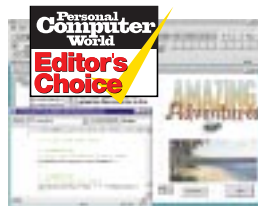
PCW April 1998 p177. Price from £79

Contact Symantec 0171 616 5600

Also Recommended ■ **Borland Delphi 3**

PCW April 1998 p183. Price from £95.18

Contact Borland 01734 320022

**Remote Access:** Symantec pcAnywhere 8.0

Takes the lead in remote access software. Remote controllers should also consider the legendary LapLink, now on version 7.5. *PCW January 1998*

p104. Price £166.33 **Contact**

Symantec 0171 616 5600

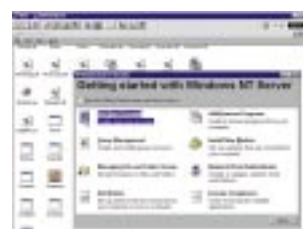
Also Recommended ■ **LapLink 7.5**

PCW November 1997 p126.

Price £176.25

Contact Traveling Software

01753 818282

**Web design:** SoftQuad HotMetal Pro 4.0

An excellent all-rounder, HotMetal Pro 4 gets our thumbs up for web design. For a slick interface and Office 97 integration, Microsoft's

FrontPage 98 is worth a look. *PCW*

January 1998 p196. Price £123.38

Contact SoftQuad 0181 387 4110.

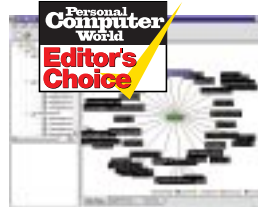
Also Recommended

■ **FrontPage 98** *PCW January 1998 p195.*

Price £116.30 **Contact** Microsoft 0345 002000

■ **Adobe PageMill 3.0** *PCW May 1998 p158.*

Price £92.83 **Contact** Adobe 0181 606 4001

**Anti-Virus:** Norton AntiVirus 4.0

AntiVirus 4.0 is our choice for protecting your PC. It offers

the best combination of features and

performance. *PCW April 1998 p124. Price*

£49 **Contact** Symantec 0171 616 5600

Also Recommended ■ **Dr Solomon's**

HomeGuard *PCW April 1998 p122. Price* £29

Contact Dr Solomons 01296 318700

■ **F-Secure 4.0 AntiVirus** *PCW April 1998 p122.*

Price £109.27 **Contact** Portcullis 0181 868 0098



ChipChat

■ “We apologise for the late arrival of your brain...”

A copy of Rail Planner (0181 315 6888, www.railplanner.co.uk) arrived on the ChipChat desk this month. Claiming to be “the AutoRoute equivalent for BR trains, ferries, Eurostar and the London Underground” it costs between £45 and £1,100 depending on the configuration, and offers users little more than they can get for free on various web sites, including Railtrack’s online timetable at www.railtrack.co.uk/travel/.

Its one selling point may be the route maps it draws, but looking at the example it produced (*below*) of one PCW staff member’s route to work in the mornings, we’re not so sure.



As you can see, the route to Liverpool Street station from Chelmsford is quite straightforward. You go south west for quite a long while and then, er, sort of veer off to the right a bit and, er, that’s it. Hmm...

■ Basically, a buzzword no-brainer

The latest craze sweeping the ranks of PC journalists consigned to endless rounds of press briefings, is Business Buzzword Bingo. Try it for yourself at www-ucs.usc.edu/~karl/Bingo/ where you’ll be able to print a card of random business buzzwords to take to your next strategy meeting.

Including such favourites as “backwards-compatible” and “team dynamics”, the idea is to cross out each one as you hear it. The first to eliminate five in a row leaps from their seat, emitting hysterical cries of “bingo!”.

■ Late entry *par excellence*

Odd late entries continue to arrive for our 1998 “PCW Reader Awards” but this

Caption competition



“Ooooh, look, it’s got a ‘stun’ setting, too! Ooops...”

Think you can do better? Then email captions@vnu.co.uk or enter via our web site, or write to the usual PCW address (*p10*) with your own captions on a postcard marked “September Caption Compo” before 28th August. We’ll print the funniest entry and the winner will receive a £20 book token.



Congratulations to Reed Howey, who won July’s caption competition with “...and with this cellphone, the keypad doubles as a riot shield”.

month saw the arrival of a *really* oddball contribution: a voting slip for the 1996 ceremony!

Having taken no less than 30 months to arrive, Mrs Randall’s entry was, unfortunately, too late to be considered for that year’s prize draw to win a 133MHz Pentium PC!

Never mind. We contacted a somewhat surprised Mrs Randall forthwith and awarded her a copy of our latest PCW archive CD-ROM which contains two years’ worth of back issues... starting with the Awards issue for which she voted.



Oops!

■ The images for this month’s inkjet group test (*starting on p180*) were supplied by those nice people at Photodisc who deserve a credit for their work. Photodisc’s online catalogue can be found at www.photodisc.com.

■ Our July ’98 issue featured Paperlite Live (*News, p29*) but the price stated should have been £89 (ex VAT) for the software alone. This does not include the C200 flatbed scanner, optional document feeder, nor the D100 electronic notepad.

