

JUNE 1998

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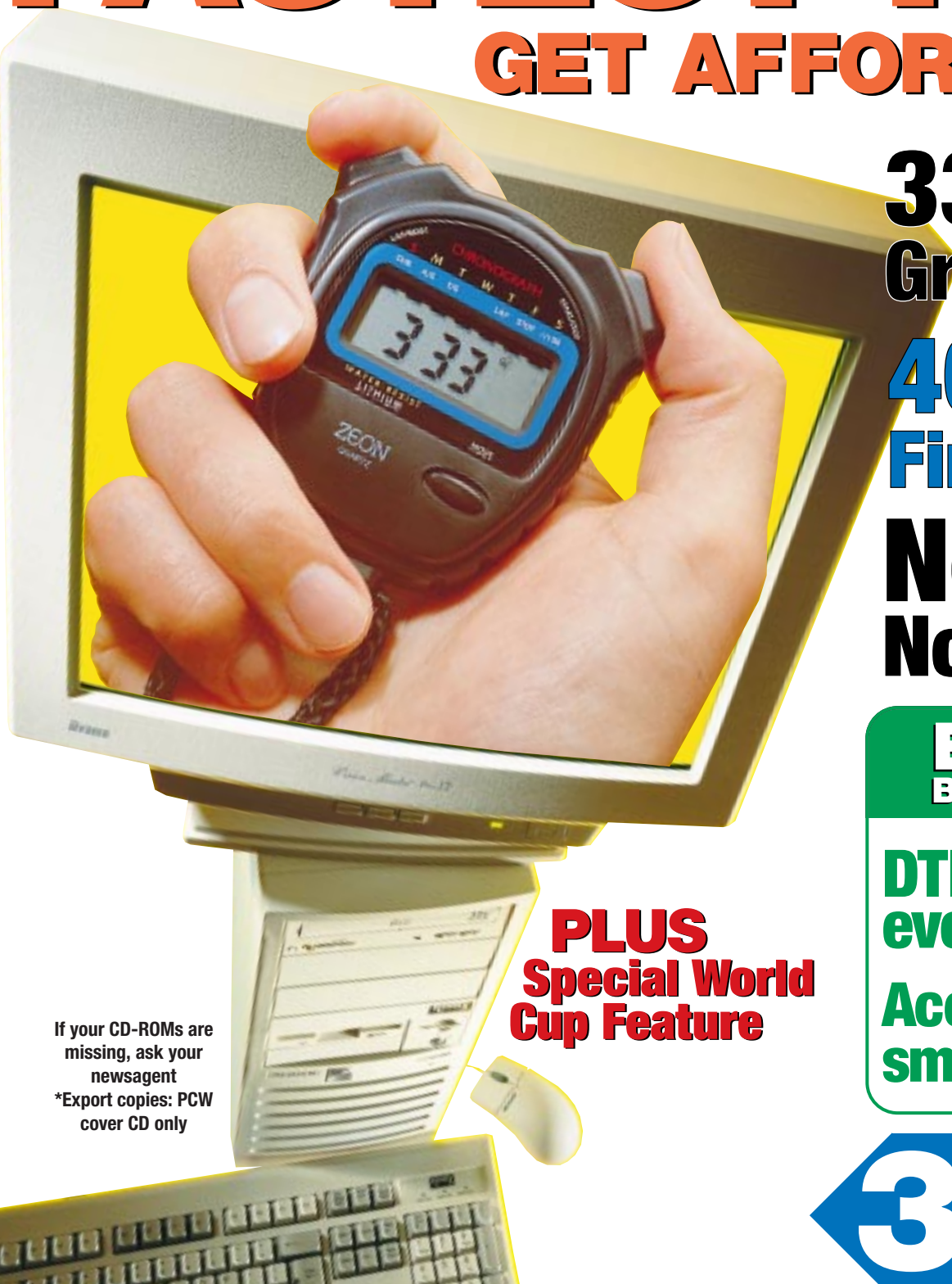


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## FASTEST PCs GET AFFORDABLE



**333MHz  
Group Test**  
**400MHz  
First Looks**  
**New PII  
Notebooks**

**EXPERT  
BUYERS GUIDE**

**DTP for  
every budget**  
**Accounting for  
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**PLUS  
Special World  
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CD-ROMS\***

# Contents



Ten affordable powerhouse PCs **p152**



Publishing for the novice and the pro **p118**



Souped-up notebooks **p186**

## Cover Feature: 333MHz group test

### 152 Fastest PCs become affordable

NT workstations were once the preserve of the big spenders, but now anyone can have a powerhouse on their desk. With the release of 350MHz and 400MHz processors from Intel, the price of the 333MHz has fallen, making them affordable for many pockets. Lynley Oram tests ten Windows NT systems, from as little as £1,349 (ex VAT).

- |                          |                         |
|--------------------------|-------------------------|
| 154 Carrera Power Pro II | 158 KT Business Plus    |
| 154 Dell Dimension XPS   | 160 Lexon 702XL         |
| 157 Elonex PTX-G333/11   | 160 Linear Powerstation |
| 157 Evesham Platinum     | 161 NEC SP-333L         |
| 158 Gateway G6-333       | 161 Panrix Fusion 333   |

## Group Tests

### 118 DTP software

Whether you are preparing your sports club newsletter or a magazine the size of *PCW*, DTP software will be essential. Tim Nott looks at eight of the best packages, catering for both the professional and occasional user.

### 194 Accounting software

Every small business needs to balance the books and keep the tax man from the door. Profit from David Carter's experience as he rounds up nine packages designed to keep you in the black.

## Features

### 112 Interview: Neil Harrison

Sohonet rushes digital images around to post-production film companies faster than a speeding dispatch rider. Michael Hewitt networks with the man who set it up.

### 142 World Cup 98

Football, more football and virtual football. John Rennie looks at all aspects of the World Cup, from the best online sites, through the best games, to the logistics and on to checking up on the referees' decisions with virtual replays.

### 186 Mobile PII notebooks

Notebooks finally catch up with desktops and get their own version of the PII processor. But are they hot stuff or just overheated? Paul Trueman and Adele Dyer look at three notebooks and separate fact from fiction.

### 212 400MHz PCs

Intel processors take another leap forward, with the new lightning-fast 400MHz chips. Nik Rawlinson takes a sneaky peek at four 400MHz sprinters, all running on new BX chipset motherboards.



## First Impression Reviews

- 72 Big Red Galileo Internet Budget PC for surfing the net
- 74 Siemens Nixdorf Scenic 320CX Notebook with ADS screen technology
- 75 Sony MultiScan 400 PST The first 19in Trinitron monitor
- 78 Rolodex REX A PDA to fit in your wallet
- 78 Sharp HC-4100A Windows CE 2 with 8Mb RAM
- 80 QMS magicolor 2 DeskLaser and magicolor 2 CX MultiPACS Exclusive look at two colour laser printers
- 83 HP OfficeJet 635C and LaserJet 3100 An inkjet and a laser, all-in-one
- 85 Creative Labs 3D Blaster Voodoo 2 3D graphics for power games
- 85 Appian Graphics Jeronimo J3 Run two monitors from one card
- 86 Lotus SmartSuite Millennium The latest office suite adds intranet functionality
- 88 Adobe PhotoShop 5 Photo editing at its best
- 90 Microsoft Outlook 98 Contact manager and email manager combined
- 93 Illuminatus 4 Budget multimedia authoring
- 95 Autonomy Agentware Suite 2.1 Surf and search with ease
- 96 Caere OmniForm 3 OCR your office forms
- 99 AND Route 98 The shortcut to route planning
- 100 IMSI Family Heritage v2 Build the family tree
- 102 Net.Medic Pro A check-up for your network
- 102 ErgoSentry Ward off RSI

## CDs and Kids

- 103 IBM World Encyclopaedia
- 104 Disney's Maths Quest with Aladdin My Personal Tutor

## Long Term Tests

- 106 Fast Forms, Photoshop, Epson EPL-5500, Logitech MouseMan Sensa

## Regulars

- 10 Subscriptions
- 13 Editorial
- 13 Next Month
- 14 Cover Disc Notes
- 24 Newsprint and Analysis
- 38 Internet News
- 61 Letters
- 70 Gadgets
- 306 Beginners
- 310 **Reader Offers**
- 325 Direct Buyers' World
- 330 Buyer's Guide
- 609 Product Locator
- 616 Ad Index
- 619 ChipChat



## Leisure Lines

- 316 Screenplay
- 320 Retro
- 321 Brainteasers
- 321 Prize Crossword
- 322 Books
- 312 **WIN!** Geofox PDA, Iomega Jaz drive, Cybermedia Guard Dogs

## Columns

- 55 Sounding Off Is "New Man" surfing the net, or is it a lads' world? Michael Hewitt thinks the latter.
- 57 Straight Talking Barry Fox speaks out on software and hardware bugbears.
- 59 Business Matters Unsung heroes of the IT department, take heart: Brian Clegg becomes your champion.
- 60 From the Desktop Catch that bus! Tim Nott takes delight in all things USB.

## Futures

- 222 Metacomputing: your home PC could play its part in problem-solving on a big scale, writes Toby Howard.
- 223 Digital broadcasting: Adele Dyer tunes in to current developments.

## Hands On Advice

- 225 **Introduction**
- 229 **Workshop: Client-Server Databases** From Access to SQL Server, Mark Whitehorn has a way with wizards.
- 233 **Internet** Nigel Whitfield puts a database on the web using Perl.
- 242 **Windows 95** Tim Nott helps you through your bootlog problems.
- 246 **Windows 3.1** Panicos Georghiades and Gabriel Jacobs cover colour settings and graphics cards.
- 250 **Windows NT** Andrew Ward on user profiles and how to set them up.
- 255 **Unix** Chris Bidmead uses tar to assemble a simple shell script.
- 259 **OS/2** Would you like Fix Pack and JDK? Terence Green obliges.
- 262 **Word Processing** Tim Nott tots up the numbers with lists and paragraphs.
- 266 **Spreadsheets** Stephen Wells tells how to tool up for a worksheet list box.
- 270 **Databases** Mark Whitehorn helps you stamp out postcode problems.
- 276 **Hardware** Roger Gann knows where to get a FAT32 upgrade for a large hard disk.
- 278 **Sound** Steven Helstrip on how to hop across the channels with VST.
- 282 **Graphics & DTP** Create animations for the web, with Ken McMahon.
- 288 **3D Graphics** Benjamin Woolley has help for would-be games producers.
- 290 **Visual Programming** Tim Anderson explores the new Data Widgets.
- 298 **Networks** Bob Walder answers your network queries and talks Alpha.



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**VNU BUSINESS PUBLICATIONS**



# Editorial

Looking at the advertising with which we're bombarded, it seems that, in the world of computers, speed is king. One month you'll be talking about "the fastest-ever...",



only to find it superseded seemingly moments later by something quicker.

Our cover story is a perfect example. There we were, happily preparing our latest PC group test of systems housing Intel's fastest chip, when along came something faster still. The delivery of new 400MHz Pentium IIs

hot from Intel's factories made our 333MHz group test contenders seem almost modest in comparison.

It's easy to get carried away. But whether the 400 had arrived or not, a 333MHz PC can hardly be described as a slouch. Better still, when a new top-of-the-range processor arrives, the more-than-acceptable versions below it plummet in price. You'll always pay a premium for the current top-rate processor, and that price tag now belongs to the 400MHz Pentium II.

More importantly, don't become obsessed with processor speeds alone and neglect other essential components of a well-balanced PC system. At least the new 350s and 400s operate 50 percent faster externally than earlier PIIs, including the 333. That means faster memory, graphics and I/O, resulting in significantly faster overall performance.

But back to this month's group test. The 333MHz PII turned out to be a dark horse in many respects. Testing it alongside the 400s, and even the brand-new PII mobile chip for nifty notebooks, revealed plenty you'll want to know before buying.

With this much movement in the processor market, we thought it perfect timing to see what each major player was up to in the near future and beyond. You'll find this, and our discoveries of the latest crop of Intel PIIs, in our most comprehensive PC group tests so far.

Finally, with only a matter of weeks before the start of the World Cup, we've taken a look at the technology behind the event. From statistics management to the media, to the fans themselves, computers have become essential players in the beautiful game.

**Gordon Laing**  
Managing Editor

# Next Month

## PCW Awards

The votes have been cast and the counting is over. Who will walk off with the coveted awards? The best products and suppliers of the past year, as chosen by PCW and you, the readers.



## £999 Pentium II Group Test

Powerhouse Pentium II PCs for a bargain £999. If your budget is limited but your ambitions are high, you'll be amazed at how much power you get for your pound.

## Sound and a MIDI workshop

If you fancy making your own music, or just blasting the neighbours away with the best sound for games, we tell you all you need to know about sound hardware and software, and how to get it working.

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**July '98 issue**

■ On sale Thursday 28th May

\* Next month's contents may be subject to change.

# June cover disc

This month we are back to our regular-format CD. No nostalgia from the last twenty years, but we have a CD still filled to the 650Mb brim with demos, utilities and other software. Quake II is out and you can try the demo in Featured Software, plus an excellent trial of CorelDraw 8.

### Important notice

The publisher, VNU, has checked the *Personal Computer World* CD-ROM 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 either the disk or any software contained 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 any new software before

### 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](mailto:afshan_nasim@vnu.co.uk).

running it on your computer, and to make regular backup copies of all your important data.

Unless otherwise stated, all software contained on the CD is for demonstration only. This means it may be restricted in some way: for example, it may be time limited or have certain functions disabled.

### 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 you'll still get better performance if few apps are running. Put the disk 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 autoloader, go to Start/Run and type in <CD Drive>:\pcw.exe

**Windows 3.1** From Windows Program Manager choose File/Run, then type in <CD Drive>:\pcw.exe and press Enter.

### System requirements

You will need a PC 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 CD-ROM 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:", please return the disk with a covering note detailing your name and address and clearly marked "PCW CD JUNE 98", to:

TIB plc  
TIB House  
11 Edward Street  
Bradford  
BD4 7BH

A replacement disk will be sent to you by post.

# Quake II

The sequel to Quake has arrived, riding the media wave and boasting a much-improved graphics engine to let you enjoy the id trademark bloodfest even more. And this month's CD brings you a taste of that action by pitching you against the Strogg, in a three-level, action-packed demo.

The goals of Quake II are divided into complex missions or objectives which are updated as the game continues, so your strategy and the effectiveness of your armoury changes the whole time.

The game contains eight large units, each with a number of levels to complete in order to proceed to the next unit. You may find you have to go between levels several times to accomplish a particular goal. It is possible to play a particular unit without working your way through all the levels preceding it,

although the creators do not recommend jumping into the middle of the game or skipping levels, as the game is designed to proceed in a progressive manner and each level is important to the unfolding of the game. But if you do want to play through a particular unit, you can launch the level with the appropriate weapons and ammo for the start of that unit.

Skill settings range from really easy (meant for kids and grandmas) to nearly unbeatable (which id programmers recommend as occasional if not compulsory exercise!). Each skill setting adjusts reaction, health, power and the number of the monsters you'll face. Quake II can also be played with other people either across a LAN or on a TCP/IP internet connection.

If you want to get a feel for Quake II before taking part, you can run a demo sequence when



you start the game. At any time, press the Escape key to pull up the Main menu.

### PCW Details

**Operating system** Windows 95

**Limitations** Limited demo — first few levels.

**Sales contact** 01895 456700

**Technical support** 0990 143525

## CD-ROM Helpline 01274 736990

# Special Ops Last Bronx

**S**pecial Ops is the first in a series of realistic, action-orientated, real-time, 3D, third-person games based on elite warfare units, with the emphasis on action and realism. You control a team of Rangers who have to eliminate opponent targets and complete mission sub-tasks in



limited time. You choose between stealth or all-out war modes and your environment is one of 3D action, time pressure and realistic combat. Sub-tasks include reprisal attacks, seize-and-destroy missions, hostage rescue and counter-

terrorist attacks. Each environment plays differently and is unique in look-and-feel. There are three levels of difficulty per environment.

Characters were created using human movement from motion-capture technology. The game is driven by Artificial Intelligence. Special effects are impressive: each effect is true to the weapon and object hit. Ambient and weapon sounds make this a spectacular game.

## PCW Details

**Operating system** Windows 95 with 3DFX  
**Limitations** Limited number of missions.  
**Sales contact** 0171 384 8027  
**Technical support** 01429 855046

**L**ast Bronx is the PC version of the Sega Saturn

hardcore street-fighting game. Features found in the full version include eight street fighters with personal weapons, eight different fighting locations with actual scenery from Tokyo, and head-to-head

network play over LAN, modem and serial link. The game is optimised for MMX. Choose from three modes: Arcade, Survival and Team Battle. The number of players can range from one to six in network play.

The demo on the CD is limited to two characters. The game requires DirectX to be installed. This can be found in the Software Library Utilities.

The first fighter to win two rounds is the winner and moves on to the next stage. To win a round you must reduce your opponent's Life Gauge to zero or have more Life left when time expires. The winner takes all.



## PCW Details

**Operating system** Windows 95  
**Limitations** Limited to two characters.  
**Sales contact** None provided  
**Technical support** None provided

# Evolution Audio Lite

**T**his full working version of Evolution Audio Lite is a MIDI sequencer with an audio track, allowing you play along to "real world" sounds or to enhance your MIDI instrument. Most tunes today rely heavily on rhythms and beats, so start your song by loading one of the included rhythm samples into the Audio Track.

Evolution Audio Lite has a built-in on-screen keyboard which can be played using the middle two rows of your PC keyboard, so you don't need a proper MIDI keyboard. Just click the Record button and you're away.

This version has only one editor screen, the Piano Roll editor. More editors, including Drum, are available in the meatier versions of Evolution Audio Lite.

You can make sure your playing is in time by using Quantize to correct any notes played off the beat. Create a bar or two of music on one track and then copy the patterns to repeat for a few bars until the track is finished. Create the next track in the same way, and then arrange the different tracks into your first complete song.



## Special upgrade offer

Evolution Audio Lite has an RRP of £39.99 but you can upgrade to Evolution Audio for £30 and get these extra features: 256 MIDI tracks, four editor screens, event list, score editor with single stave printing, single-singered chords, chord track, playright mode and snapshot mixer settings.

Upgrade to Evolution Audio Pro for £60 and get all the features of Evolution Audio, plus: multiple stave printing with lyrics, multiple patch lists, chord wizard, grouping of mixer faders,

multi-track MIDI recording, lyric insert/editing, multiple editing windows, karaoke screen, punch in/out recording for MIDI, multiple port mixer/recordable controls, XG controllers named in mixer settings, MIDI clock, and SMPTE/MTC Sync Support.

Upgrade to Evolution Sound Studio Gold for £110 and get all the features of EVAP, plus: 16 stereo audio tracks, real-time delay/echo/reverb audio effects, full control over volume, effects and panning levels for audio, record while playback of audio, audio track-bouncing, VU display for audio tracks, AVI (video) support, and loads more.

Also available: the Evolution MK-149 MIDI keyboard and upgrade to Sound Studio Gold, for only £200.

## PCW Details

**Operating system** Windows 3.1 / Windows 95  
**Limitations** Full working version  
**Sales contact** 01525 372621  
**Technical support** 01525 372621

**CD-ROM Helpline 01274 736990**



# Image Pals 1.2

YOU WILL NEED THIS SERIAL NUMBER TO INSTALL IMAGE PALS: 12543-20609-00013

**T**he ImagePals suite includes three programs for processing images and organising files:

**Enhancer** An image creator and editor.



**Album**  
Organise files of all types into collections.

**Capture**  
A screen-capture program with viewing, editing,

saving, and extensive conversion functions.

ImagePals' components look and feel similar, and share features including black and white, greyscale, 16- and 256-colour and RGB image support, common image and graphics file compatibility, and conversion between file formats.

## Special reader upgrade offer

Upgrade from ImagePals to PhotolImpact 4.0 for

£59 (inc VAT and delivery).

ImagePals was originally designed to run on Windows 3.1, but PhotolImpact is a Windows 95 application which offers excellent all-round benefits over earlier versions of Ulead products. Added benefits include rectangle, square, ellipse, circle, lasso, magic wand, mask brush, bezier curve tools, retouch with dodge, burn, blur, sharpen, tonal adjustment, smudge, saturate, warping and bristle smear, creation of attractive 3D text and objects, and the import of Photoshop, QuickTime and AVI data as images.

PhotolImpact could be yours for £59, including VAT and delivery, if you upgrade from ImagePals. For further information contact BIT (UK) Ltd Sales on 01420 83811.

## PCW Details

**Operating system** Windows 3.1

**Limitations** Fully working version.

**Sales contact** 01420 83811

**Technical support** 01420 83811

# Screen Cam 97

**S**creenCam is used to capture PC screen activity, cursor movements and sound into files that can be distributed across the internet and corporate intranets. Internet/Intranet sites can be made more interesting by incorporating ScreenCam movies to show demonstrations, tutorials and information. ScreenCam 97 incorporates several new features that make creating and distributing ScreenCam movies easier than ever.



## PCW Details

**Operating system** Windows 95

**Limitations** Saving of movies, captions, object linking and embedding disabled.

**Sales contact** [www.downloadshop.co.uk](http://www.downloadshop.co.uk) or local retailer.

**Technical support** None.

# CorelDraw 8

**T**his update of CorelDraw 8 has new, interactive tools that let the user apply effects and adjustments directly to an image. On-screen controls provide immediate feedback on changes as they are made. Basic node editing or object transformations can be carried out using any selected creation tool, and placement and display is smoother and more precise. Keyboard shortcuts have been added to CorelDraw 8 and Corel PhotoPaint 8 for quicker tool selection, effects and other commands.



The facility to customise certain areas in CorelDraw 8 speeds up the work process. For example, you can save magnification levels in the Zoom Property Bar or set custom page sizes in the page type list. Hidden objects are easier to locate by clicking the image and holding the Alt key until the image is selected. CorelDraw 8 and Corel PhotoPaint 8 now also make full use of the features of the Microsoft IntelliMouse.

Here are some of the features:

1. Customise toolbars, hotkeys, menus, the status bar, colour palettes and application defaults.
2. Add effects to objects using the Interactive Distortion tool.
3. Interactive extrusion can be applied to any object by clicking and dragging, setting the vanishing point and adjusting the depth of the extrusion.

4. Set on-screen colour by pressing Ctrl while clicking on a colour in the on-screen colour palette.
5. Flow text from a paragraph to any number of objects or paths and back to another paragraph text frame.
6. Lock objects on the drawing screen to prevent inadvertent changes or moves.
7. "Undo" works across File Saves to return to a previous version after saving your work.
8. Apply 3D effects to text using lighting, bevel options and textures: rotate and zoom text while in editing mode.
9. Preserve layout on a page when publishing to HTML. A Wizard walks users through the publishing process.
10. Java applets, radio buttons, options lists and text fields can be applied to web documents.

## PCW Details

**Operating system** Windows 95

**Limitations** 30-day fully working trial.

**Sales contact** 0800 581028

**Technical support** Not supported.

**CD-ROM Helpline 01274 736990**

# Software Library

## ● Essential Utilities

### 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.)

### 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.)

### DirectX 5.0 (Win 95)

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

### 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.)

### Graphics Workshop Patch (Win 3.1/95)

Patch file to update Graphics Workshop to the latest 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.)

### 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.)

### Paint Shop Pro 3.11/4.14 (Win 3.1/95)

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.)

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

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

### 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 This Month

### Avery Wizard 1.0 (Win 3.1/95)

Makes printing onto labels, cards and indexes easier than ever before. It takes you through a series of simple on-screen steps and templates for formatting and printing 64 different Avery

products. (Full version.)

### BugCollector Pro 2.0 (Win 95)

BugCollector is ideal for software development teams, helpdesk staff, quality assurance, and anyone who needs to know the status of your software's error reports and feature requests. (30-day trial version.)

### Cribator 2 (Win 3.1/95)

Cribator allows you to create, edit and store texts and programs on a PC and to send them to an HP 48G calculator. (Evaluation version.)

### CriSP 5.1 (Win 95)

A powerful yet easy-to-use cross-platform file editor. Suitable for programming, writing HTML for web pages, or to manipulate very large data files. (45-day trial version.)

### Eraser 1.0 beta (Win 95)

Enables you to erase a file by wiping its contents beyond recovery, scrambling its name and dates and finally deleting it. Fast, secure and very flexible. (Shareware.)

### HotSlots 1 (Win 95)

3D HotSlots is a multi-featured slot machine game with real-time 3D animation and colour graphics. (Function-limited demo: reduced features.)



### ibase 1.5 (Win 3.1/95)

Unlike text-based databases, which are ineffective at dealing with objects like images or moving images, the iBase Image Database has been designed to deal with objects and not just text. (Function-limited demo: number of records and document viewers.)

### Illuminatus 4.0 (Win 95)

From power presentations to picture portfolios, from simple slideshows to sophisticated software samplers, from web pages to educational materials, Illuminatus allows you to create effective multimedia without the hassle of complex scripts and programming knowledge. (Function-limited demo: reduced file format and import/export options.)

### Microfile 2.1 (Win 3.1/95)

Allows you to scan and store documents in your PC, avoiding the clutter of paper storage thus improving the efficiency of your home or office. (Limited demo: maximum of 25 documents.)

### Net.Medic 1.2 (Win 95)

A desktop solution which works with your internet browser to monitor, isolate, diagnose and correct internet performance problems. It is suitable for the business desktop at all levels as well as the home or office user. (30-day trial version.)

### Personal Finance Organiser 1.0 (Win 3.1/95)

Personal Finance Organiser is designed to let you keep track of your bank or building society accounts. (Limited-time shareware.)

### Real Golf 1.0f (Win 95)

Real Golf is a totally new approach to the game of computer golf. As well as being a course editor, it lets you play other people's courses over the internet at your own pace! (Fully functioning for two days, runs with reduced features thereafter.)

### Slicks 'n' Slide 1.30d (DOS)

Slicks 'n' Slide is a simple car-driving game for up to four players, with many options. The idea of the game is to drive vehicles around a track as fast as possible, and that's it, really. (Shareware.)

### Space Empires III 1.13 (DOS)

Space Empires III is a massive space strategy game for Windows 95. You control your empire in an ever-changing and hostile galaxy. Design your starships and use them to explore new solar systems throughout the galaxy. (Shareware.)

### Summons 1.2 (Win 3.1/95)

This program is intended to help people use the small claims procedure in the English courts. The program enables you to enter all the details

that go on a small claims summons form. (Time-limited demo.)

### Visual Personnel 2.04 (Win 3.1/95)

A powerful tool offering first-class organisation for your company. Based around a database holding up to 500 separate pieces of information on each member of staff, this package lets a standard of organisation only previously available by paying thousands of pounds. (Evaluation version: limited to ten employee records.)

### Java 1.1.4 for OS/2 Warp

This is an update of Java for OS/2 Warp that provides Java 1.1.4 on OS/2 Warp 4, OS/2 Warp Server SMP, and Workspace on Demand. This version replaces Java 1.1.1 and coexists with Java 1.02. It contains the runtime environment, the Java Development Kit (JDK).

### OS/2 Feature Install Version 1.2.1

IBM OS/2 Feature Install Version 1.2.1 is a browser-based installation utility that is used to install some IBM Software Choice features. Feature Install Version 1.2.1 contains enhancements for installation reliability and serviceability.

### Netscape Navigator for OS/2

New release of Netscape Navigator for OS/2 now supports IBM's Java 1.1.

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# ClaraNET

**C**laraNET offers full internet access including email, the web and newsgroups. All the programs you need are included as part of the Atlantis software. 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 supports both K56 Flex and US Robotics X2 technologies, and you get 5Mb 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.



**PCW Details**

**Operating system** Windows 3.1 or higher  
**Limitations** One month free, billed if use of service is continued.  
**Contact** 0171 903 3000

# CompuServe

**C**ompuServe is the UK's leading Online Internet Service, offering fast and easy access to the internet and its own 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.



All prices are set in US dollars but you will be charged in your local currency based on the prevailing exchange rate. Membership is \$9.95 per month. Prices exclude VAT where applicable.

Free online time is subject to our Fair Use Policy. For more information, GO UKFAIRUSE. \*650 hours may only be used within the first month.

**PCW Details**

**Operating system** Windows 95 and Windows 3.1  
**Limitations** One month free trial, 650 free hours to be used within one month.  
**Contact** 0990 000200

# AOL

**E**asy-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. Internet access is easy: go directly to web pages from your AOL menu bar. AOL offers 33.6K access speeds nationwide and has MS Internet Explorer 3.0 integrated as its main 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 of web space!
- 100 percent local call access.



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

**PCW Details**

**Operating system** Windows 95 and Windows 3.1  
**Limitations** One month free membership, 50 free only hours.  
**Contact** 0800 279 1234

# Virgin

**V**irgin NET is the award-winning unique online service from the Virgin Group of companies. Easy to use, with help always available and, best of all, your first month absolutely free.



For the price of a local rate phone call for the time you are online, Virgin NET's content and resources will help you get the most out of the internet. After your free trial Virgin NET costs just £11.99 per month, including VAT.

## What you get with Virgin NET

You get high-quality, fast and reliable access to the internet for both Mac and PC users: email address; 24-hour support; unique channels; 10Mb of free web space.

**PCW Details**

**Operating system** Windows 95 and Windows 3.1  
**Limitations** One month free, billed if use of service is continued.  
**Contact** 0845 650 00 00 (24 hours)

# Web access

**I**f you have an internet connection, you can access the *Personal Computer World* web site direct from the CD. Just ensure your connection is open, and click on the bar on the opening screen of the CD.

## vnunet at www.vnunet.com

Europe's largest IT and business publisher. The site contains minute-by-minute news updates via the Newswire Service, and some of the best editorial features from VNU's fifteen print titles.

## Jobworld at www.jobworld.co.uk

Jobworld is the fastest, most convenient internet recruitment site, displaying contract and permanent vacancies in real time.

Absolutely free to UK and international job-seekers, Jobworld carries thousands of IT



contract and permanent vacancies, and permanent vacancies in accountancy and management consultancy. It already satisfies 30,000 registered contractors and posts up to 500 new jobs a day.

Find the right job today and apply online, there and then. Or, register for the email alert service, which brings you the jobs you want, direct to your mailbox.



**CD-ROM Helpline 01274 736990**



# Kick off to the World Cup

**W**ith the World Cup only a few short weeks away, we thought we'd get you in the mood with a fantastic football game, exclusively customised for *Personal Computer World* readers. Installation and game control instructions are below. For a detailed look at the technology behind the scenes of the big event, check out our feature on page 142.

## Installation

Kickoff is a DOS-based game and will run fastest under DOS mode. In Windows 3.x, exit Windows and follow the instructions below. In Windows

95, select the "Restart the computer in MS DOS mode" option when shutting down. If you aren't getting any sound or access to your CD-ROM drive from DOS, then either install DOS drivers or run Kickoff from a DOS session within Windows 95. The latter option will not be as fast, but will ensure any Windows sound and CD-ROM drivers are loaded.



**Pretend you're there:  
live out the football  
action at home**



**This fully-working football game will have your ball control and positional skills up to scratch by the time the World Cup kicks off**

Insert the CD in the first CD-ROM drive. From Windows 95, click RUN from the Start menu and type d:\KICKOFF, where d is the drive letter

of your CD-ROM drive. Alternatively, you could start a DOS session by selecting DOS prompt from the Programs branch on your Start menu, then follow the DOS instructions below.

From DOS, change to your CD-ROM drive (i.e. d:<ENTER>). Type KICKOFF at the d:\ Prompt. Then follow the on-screen menu.

## PCW Details

**Operating system** Windows 95

**Limitations** 30-day fully working trial.

**Sales contact** 0800 581028

**Technical support** Not supported.

## GAME CONTROLS

### Keyboard controls

	PLAYER 1	PLAYER 2
UP	F	V
DOWN	C	J
LEFT	Z	K
RIGHT	X	L
SHOOT	\	Y
PASS	G	;

### Joystick controls

You can use two- or four-button controls if you are playing a one-player game. If two players are using joysticks, the players can use *only two buttons each*. (NOTE: MAKE SURE AUTO FIRE IS OFF.) The buttons are referred to as A and B for two-button joysticks and A,B,C,D for four-button joysticks.

Use calibrate joystick (see "Calibrate joystick") to identify swap buttons if required.

### Direction = Joystick Direction

	2 BUTTONS	4 BUTTONS
Pass the ball	B+DIR	B+DIR
Shoot the ball	A+DIR	A+DIR
Chip the ball	N/A	D+DIR
Push the ball	A+B+DIR	C+DIR
Cross the ball	A	D
(If the player is in the crossing area near the byeline of the opposition goal.)		
Volley the ball	A	A
(If the ball is between ankle and knee high.)		
Head the ball	A	A
(If the ball is in the air.)		
Over Head Kick	A	C+D
Tackle to get the ball	A	A
(Player tackling is close to the ball.)		
Sliding tackle	A	A
(Player tackling is distant from the ball.)		
Dirty tackle	A+B	A+B
Throw in	A	A

(The longer you hold, the further it moves.)

Corners	A	A
Substitution	F1/F12	F1/F12

### Keeper controls

The keeper is automatically controlled during the game, except for the goal kicks and penalties. Goal kicks: move the marker to indicate where you want the ball to land. If a cross appears, you have moved the marker too far.

Low dive	A+DIR	A+DIR
High drive	B+DIR	B+DIR

### Calibrate joystick

If you are using an analogue joystick, you are advised to calibrate your joystick regularly. Joystick plugged in port 1 is joystick 1.

Move your joystick round. Each arrow will change colour to indicate that the joystick is registering in that direction.

**CD-ROM Helpline 01274 736990**

# Newsprint

## BUK scoops awards

British companies stole most of the honours at the international British Interactive Multimedia Association Awards. The Beeb ([www.news.bbc.co.uk](http://www.news.bbc.co.uk)) won the Consumer Information Services prize. Advertising and promotions awards went to Guinness's The New Local ([www.guinness.ie/local](http://www.guinness.ie/local)) and Perfect World's Elton John - The Bigger Picture. The British Library seized the Interactive Displays award for its digital book display (*detail above*), Turning the Pages. Riven, Red Orb's sequel to Myst, won the Entertainment Award.



## Giants target TV

Intel and Microsoft are getting together to produce an integrated system for broadcasting interactive television content to PCs and set-top boxes. But what other opportunities are there for cable providers and their subscribers? Cable TV analysis, page 36

## Rival to Windows

The Be operating system has been ported from the Mac to the PC. Full story, page 27

# 'PC on a chip' threat to Intel speed merchants

New chips launched by Intel and rival clone makers presage major changes in the PC and the market into which it is sold.

Intel has announced its fastest-*yet* PII chips, clocking 350MHz and 400MHz. They are the first to use the new 100MHz system bus and compatible 440 BX chipset. It also

launched 233MHz and 266MHz mobile chips. But for the first time in two decades, interest has shifted from increasing processing power to price-performance issues. The impetus for this has come from the clone makers, who are undercutting Intel

with cheap processors powerful enough for most desktop tasks.

As Intel launched the new PIIs, Cyrix announced a new MII chip it rates at 300MHz (i.e. it claims a performance equivalent to a 300MHz Intel). This stacks up against AMD's 300MHz K6 and Intel's new low-

end 266MHz Celeron. The new Cyrix will cost \$180, slightly more than the Celeron; but the Celeron suffers from a lack of on-chip cache. Cyrix has also launched a 333MHz-rated version of its highly-integrated Media GX chip.

But potentially the most far-reaching announcement was that Cyrix, now owned by National Semiconductor, is developing a "PC on a chip" for release next year. This will pack the central processor and support chips, including graphics accelerator, on to one piece of silicon. Only memory will be separate.

The new chip will be put into TV sets, set-top boxes and cheap (sub-£300) PCs. This would bring the price of a PC down to that of a television and is likely to attract new users.

Intel itself sees the market fragmenting into mobile, basic, power user and high-end machines.

**Clive Akass**

Cheap PCs challenge NCs, page 26  
News analysis, pages 40 and 41  
First look at new mobiles, page 186  
First look at 400MHz PCs, page 212



## Demon takeover

ScottishTelecom and Demon Internet, which virtually created the internet boom in Britain, were working out details of a takeover deal as we went to press.

Both companies were keeping their cards close to their chests as they worked out final details. But it was expected that the telecoms company would pay £66 million for Demon. There had been earlier speculation that BT or Deutsche Telekom was the secret buyer.

Analysts said that Demon was a prize catch, citing its good reputation and loyal customer base. Yankee Group analyst Chris Lewis said, "ISPs can be a good buy for telcos that have come to the market late." ScottishTelecom already owns a data service, Scotland On Line.

## Vendors rush out PII notebooks

Manufacturers rushed out notebooks using the mobile PII. Mitsubishi's 266MHz AL720 has 64Mb SDRAM, a 4Gb disk and a RRP of £2,699 ex VAT. Fujitsu's 266MHz LifeBook 990Tx2 includes ATI's 3D Rage LT Pro graphics controller, making it suitable for DVD. No price had been announced at the time of going to press.

Powercom Direct added 233MHz and 266MHz models, with 266s starting at £2,149 ex VAT. Gateway is making the PII standard on its Solo 5100 and 9100 notebooks, which start at £2,479 ex VAT.

Siemens Nixdorf placed the PII in its 233MHz and 266MHz Scenic Mobile 510s, which are priced from £3,299 ex VAT. Finally, Digital announced its first notebook to use the mobile "Deschutes" processor, the HiNote VP 765. It will sell for about £3,095 ex VAT.

Mitsubishi 0800 212422, [www.mitsubishi-computers.com](http://www.mitsubishi-computers.com). Fujitsu 01344 475555, [www.fujitsu-computers.com](http://www.fujitsu-computers.com). Powercom Direct 01753 680777, [www.powercom-direct.co.uk](http://www.powercom-direct.co.uk). Gateway 0800 552000, [www.gateway2000.co.uk](http://www.gateway2000.co.uk). Siemens Nixdorf 0800 125555, [www.sni.co.uk](http://www.sni.co.uk). Digital 0800 393200, [www.digital.co.uk](http://www.digital.co.uk)

News edited by Clive Akass; [news@vnu.co.uk](mailto:news@vnu.co.uk)Internet News edited by Adam Evans; [adam\\_evans@vnu.co.uk](mailto:adam_evans@vnu.co.uk)

## Rory makes a QuickAddress buck

■ So what's this? Rory Bremner, scourge of hypocrisy, mocker of politicians, promoting a junk-mail package? Well, even a satirist has to earn a buck.

Bremner did seem a teeny bit embarrassed at the launch of the latest version, 3.0, of QuickAddress. "Tell this lot your post code and they can tell you what underpants you're wearing," he cracked.

As it happened, he was hardly exaggerating. QA's basic function is to put full addresses to post codes, which saves a lot of typing and makes for accuracy.

But modules can link addresses to other information, such as census records, marketing profiles, and any other file that may have you pinned down. The basic package costs £950. An annual service to a company with a million customers can be £20,000 a year.

The money is quickly recouped by Royal Mail accuracy discounts alone, according to md Simon Worth, who founded Quick Address Systems. He is stung by the term "junk mail".



He said: "Targeted marketing can actually help the customer. It ensures that they get information on products they really want."

QAS 0171 498 7777

## Bug buster bluster

Tony Blair's plan for an army of millennium bug busters is getting mixed reviews. At the Tackling the Millennium Bug conference, he announced £1,300 grants for small and medium businesses to send 20,000 trainees on accredited short courses. He predicted that the young, retired and long-term unemployed would take advantage of the scheme.

The initiative is better late than never, says Clive South, director of resources at Software Personnel. "The IT industry struggles because people don't take in new entrants," he said. "It's getting harder to get people, so anything to subsidise investment in training is good."

Doug Brownlie, md of training firm AC Interskill, believes it's a good start but that a long-term view is necessary. "You need to train people over an extended period of time, to extend it beyond simply the millennium bug and Cobol," he said.

But others questioned the advisability of sending in IT greenhorns. Shadow Trade and Industry Minister, Cheryl Gillan, called the scheme "absolute nonsense", saying that trainees couldn't possibly be up to speed in time. Terence Roll, vice-president of software solutions provider Reasoning, also voiced concerns: "Where do you



find these people? What do you train them in?"

Jack O'Sullivan, who leads the Skills Program for Action 2000, says that the scheme has been widely misunderstood. "You're not going to turn out expert Cobol programmers in a week," he acknowledged. "But you aren't building new systems, you're analysing existing ones."

● *More millennium bug news on p26*

"Are you sure you've been fully trained?"

### Short stories



■ Your PC is black, your screen is flat: too bad your workstation was designed by Hieronymus Bosch. Parnham College design students prove that computer desks can be both stylish and practical at their exhibition at The Gallery, Cork Street, London (29th June - 4th July). Prices start at £1,100.

Parnham College 01308 862204



■ The petite CanoScan 300S, which scans an A4 sheet in 15 seconds and can copy documents to a printer, is about as big as a roll of kitchen foil. You can put it in front of the PC, on top of the monitor, or stick it to the wall. RRP £199 (ex VAT).

Canon 0121 680 8062;  
[www.canon.co.uk](http://www.canon.co.uk)

### Multiple net access

■ The ZyXEL Prestige 100 ISDN router connects multiple LAN users to the net simultaneously, using a single IP address. Fully compatible with ISDN2e, the £399 (inc VAT) router is also suitable for teleworkers who need access to the company network.

Electronic Frontier 0118 981 0600;  
[www.electron.com](http://www.electron.com)

### Win98 launch date

■ Windows 98 will ship on 25th June for about \$100. Microsoft was expected to announce as we went to press.



## Millennium bug short stories

**Office hols bugbear**

■ The millennium holiday promised by Peter Mandelson should be cancelled, according to Action 2000. It says that office staff should be at work to deal with a potential system crisis. Many businesses, including banks, have already cancelled staff leave during the Christmas period.

**Not so bug-free**

■ Manufacturers and retailers are still selling computer systems with the millennium bug, warns the British Bankers' Association. The association told the Commons Science and Technology Committee that some of these systems are being passed off as year 2000 compliant.

**Nuclear impact?**

■ Opinion is divided over whether mission-critical applications will fail on 31st December 1999. The UK Health and Safety Executive says there is no major hazard risk in the nuclear, chemical, offshore oil, mining and railway industries. But US presidential adviser, John Koskinen, warns that the bug could have a possible impact on nuclear weapons, air traffic control, military communications and financial markets.

**Survivalist element**

■ An anonymous senior Barclays Bank executive is telling people to sell their homes, buy gold and stockpile cash in case the millennium bug causes currencies and stock exchanges to plummet. He plans to start hoarding candles, tinned food and bottled water, and said that another major company director is planning to start a commune and buy a shotgun to deter looters.

**Baked beans bugged**

■ Millennium bug problems are already being reported by companies. Tesco's computers tried to return tinned goods with a post-2000 expiry date. TSB's couldn't cope with a five-year plan, and Rover's refused to issue six-year warranties.

# A proliferation of printers

Epson has added three printers to its Stylus inkjet range to cater for home, professional and business users.

The Stylus Photo 700 (pictured below) is priced at £271 (ex VAT) and is suitable



for photographic and general-purpose use. It comes with Adobe PhotoDeluxe and Epson Print Adventure.

The Stylus Photo EX, which costs £387, reproduces photographs and printing enlargements up to A3 size. Finally, the professional Stylus Color 850 offers network capability and is aimed at either workgroups or power users. It costs £319.

● Xerox is cutting the price of its DocuPrint 4508 by £100. The monochrome laser, which is £399, is aimed at business users and has a paper capacity of 500 sheets and extensive font-management options.

● QMS has introduced two laser printers: the DeskLaser

600P and the DeskLaser 1600. The £239 (ex VAT) 600P is a personal printer with an output of 6ppm, 600 x 600dpi resolution and the smallest footprint in its class. The 1600, which costs £799, is a mid-range 16ppm printer with resolutions of up to 2,400 x 600dpi.

● Hewlett-Packard has introduced a new family of A3-size workgroup printers, the LaserJet 5000 series. Replacing the HP LaserJet 4V and 4MV, they have 16ppm output and 1200dpi resolution and start at £1,239 (ex VAT).

Epson 0800 289 622, [www.epson.co.uk](http://www.epson.co.uk). Xerox 0800 454197, [www.xerox.com](http://www.xerox.com). QMS 01784 442255, [www.qms.nl](http://www.qms.nl). Hewlett-Packard 0990 474747, [www.hp.com](http://www.hp.com)

## Cheap PCs challenge NCs

■ Network Computer spin-doctors went into overdrive over a *Wall Street Journal* report that the NC is running out of steam. The paper said companies like Federal Express have dropped NCs in favour of low-cost PCs.

PC vendors realised they had to cut costs to compete and have done so. National Semiconductor's PC-on-a-chip will put a sub-\$600 200MHz PC on the market by Christmas. Sun's Java Station costs \$699 without a keyboard and monitor.

NCs also have to contend with the incredible momentum of Windows, especially as corporates move towards NT architectures.

Sun and IBM will continue to push the NC but they can see the writing on the wall.

Officials seem resigned to position the JavaOS-based NC as a PC complement rather than a PC killer.

Dataquest says 144,000 NCs were sold worldwide last year, and 1998 sales are expected to reach only 480,000 — compared to an estimated 80 million PCs.

NCs promise savings on managing and upgrading but the long-term benefits are unproven. They could gain ground as terminal replacements, but they are going to end up in niche markets, at least for the next two or three years.

■ Barring some intervention by the Justice Department, Windows 98 will hit the market this summer and may be a bigger draw than even

Tim Bajarin reports from the US



Microsoft expects. About 35 percent of corporate users are still on Windows 3.1, intending to upgrade to NT 5.0 when that hits the market in early 1999.

But Gartner and Giga analysts are telling clients to move to Windows 98 and move on to NT 5.0 in its second or third iteration. They point out that Windows 98 is effectively the third iteration of Windows 95, a proven and stable OS.

Given Gartner and Giga's clout with corporate users, I expect this approach will be widespread.

# Be here and now... the PC gets new operating system

The PC has a new operating system. BeOS, which received rave reviews when it was first developed for the Mac, has been compiled and optimised for Intel processors.

The software comes from Be, formed in 1990 by Jean-Louis Gasse, former president of Apple's product division. It was heavily tipped to become the new Mac OS, superseding System 7, but reportedly the companies could not agree a price. Instead, Apple got the foundations of a new operating system when it bought Steve Jobs' NeXT.

Be argues that today's OSes are rooted in the computing of two decades ago and so are not well equipped to deal with today's high-speed communications and real-time video or audio.

Moreover, they have built up layers of "silt" over the years. "These layers deliver new services, route around services no longer required, provide specialist functions for individual applications... and... provide a level of backward compatibility," says a Be white paper\*. It



claims: "As this software silt builds up, it consumes more of the computer's processing power and hardware resources."

The new OS, which Be describes as a "Media OS", was designed from scratch for multimedia processing. Features include:

- **Symmetric multiprocessing**  
The BeOS currently supports up to four processors in parallel. This is facilitated by...
- **Pervasive multithreading**  
Applications are broken down entirely into small tasks that can be performed in parallel.
- **Protected Memory.** Each application is sandboxed into its own memory space so

that it does not bring others down if it crashes.

The OS bundles net and MIDI support and includes a native audio synthesiser. Some applications, lumped under the unfortunate term BeWare, are available from the Be web site, and the company claims more are on the way from more than 5,000 developers.

The BeOS should be available by the time you read this, for £57.80. PCW will be looking closely at it next month.

**Clive Akass**

\* *The media OS white paper and other information:* [Be.com](http://Be.com)  
0181 230 3134, [www.be.com](http://www.be.com)

## Short stories

### Police pinch pirates

Trading standards officers in Surrey claim to have uncovered a software piracy network extending up into the Midlands.

Software worth hundreds of thousands of pounds or more was seized in dawn raids by police in Surrey, Sussex and Cheshire, according to a statement from the Kingston-based officials.

The software was on floppy disks and CDs. CD copiers and other computing equipment were also seized. The goods had been sold across Britain via car-boot sales, and internationally via the internet. Victims included customers who had bought by mail order, believing they had bought fully-supported products.

### Disabled enabled

Electroustic has a new range of keyboards for the disabled starting at £475 (ex VAT). The enlarged keys give physical movement and tactile feedback for people with motor difficulties. Audible or LED flash feedback is available for blind or deaf users.

Electroustic 01264 333664



The Avatar Shark-250 mobile hard-disk drive with mini-removable media, is 3.5in x 5.5in. It needs no power adapter. Each HARDiskette holds 250Mb of data. The £174.95 (inc VAT) drive is quick enough to let you run apps off it: 2Mbps for the PC card and 1.25Mbps for the parallel port.

Nexus Peripherals (distributor)  
01491 413663. Avatar  
[www.goavatar.com](http://www.goavatar.com)

### Wire-less ways

The V75 17in monitor (£490 ex VAT) uses Compaq's concealed cable management system to eliminate a tangled mess of wires. Users get high contrast and a bright, clear image with 1,280 x 1,024 resolution and 0.26 dot pitch.

Compaq 0845 2704000,  
[www.compaq.co.uk](http://www.compaq.co.uk)

## Intel pushes videoconferencing station

Intel has launched Teamstation, a network-enhanced videoconferencing system to complement its Proshare desktop system. The company claims it scores over rivals in offering access to all network resources.

Proshare sales specialist, Rob Prince, admitted that videoconferencing has not taken off as expected but claimed new data-sharing facilities made their product more attractive: "As it is PC-based, there's no need for complex integration. It is very easy to use."

Some analysts remain unconvinced. "It's still nothing more than a toy," said Ovum's new-media specialist, Iain Stevenson. "They are trying to convince us that it's worth the money and the data-sharing facility is useful... we'll say 'OK, great fun this camera, now let's turn it off and get down to business'."

Teamstations using a 266MHz PII with a wireless keyboard and auto-tracking camera start at around £7,000.

**VNU Newswire**  
Image Micro (dealer) 01635 861122

# Discounts make ISDN cheaper than standard business lines

British Telecom is offering £100 discounts, until 30th June, on ISDN basic start-up charges. The cuts mean that for a big user, a start-up works out cheaper for a minimum twin-line ISDN connection than for installing two new standard business lines. However, ISDN remains expensive as an alternative to a single standard line for the home or small business.

BT appears to be challenging the railway industry for the prize of who can devise the least comprehensible pricing structure. To help you get at the truth behind BT's latest "ISDN for £99" TV campaign, take a look at the table below, compiled by Newsprint: on the left are various start-up options suitable for different levels of line usage; the last two rows show for comparison the cost of single and double business lines.

The most significant figures in terms of real relative costs are shown in the last two columns, which take account of phased payments and discounts.

The table takes no account of time-based charges, which are roughly the same for both technologies, although ISDN has a smaller minimum call charge for short file transfers



Xircor claims a major design win with its new RealPort PC cards, which use the whole depth of a Type III slot to provide room for standard sockets, eliminating the hassles of specialist cabling. The first, a £239 combined 10/100 Ethernet and 56K card, packs one RJ-45 net jack and two RJ-11 phone sockets — one for a pass-through.

Xircor 01256 332552

and security checks. There is a different pricing structure again for ISDN 30, for firms taking eight or more ISDN lines.

BT continues to trial Home Highway, a hybrid scheme which will offer a single ISDN line as well as an analog line (on which you can use all your old equipment).

One thing BT is trying to find out is how much people will be willing to pay for the service. It is unlikely to be generally available until at least the end of the year

Further details of ISDN charges can be found at [www.isdn.bt.com](http://www.isdn.bt.com).

Clive Akass

## Leased line costs plummet

Leased lines are becoming an increasingly attractive alternative to ISDN for fast net links, even for comparatively small businesses.

Mailbox Internet is offering 64Kbit/sec lines, equivalent to a single ISDN line, in Central London (0171 area) and Central Manchester for £3,999 a year plus £500 installation. The

company claims this is between £2,600 and £4,500 cheaper than similar services by major UK providers.

A leased line provides a permanent connection to the web, allowing people to access you as well as providing an outward link. Mailbox Internet 0171 371 8558; [www.mailbox.co.uk](http://www.mailbox.co.uk)

	Old	Spring offer	Quarterly rental	Annual rental	Call allowance 1st year	Call allowance 2nd year	Call allowance thereafter	Total cost over two years	Annual cost thereafter
Start-up	199	99	133.75	535	105	105	230	959	305
Fast Start	500	400	133.75	535	355	230	230	885	305
Low Start	400	300	0	352	0	0	0	1004	352
Call Plan	199	99	0	1100	795	795	795	709	305
Call Plan plus	199	99	0	2400	2095	2095	2095	709	305
Standard business									
Single line	116		37.2	148.8				413.6	148.8
Standard business									
Two lines	158		74.4	297.6	0	0	0	753.2	297.6

BT charges for ISDN compared with plain old telephone business lines. Total charges (all ex VAT) assume call allowances are used up. This makes the no-allowance Low Start option suitable for companies that keep an ISDN link as a little-used fail-safe for a leased line.

## Short stories

### Flash memory cards reach 220Mb

ATA flash memory cards, which a host device treats like a disk drive, are now available in capacities beyond 160Mb.

Simple Technology is offering five new capacities: 48Mb, 64Mb, 80Mb, 128Mb and 160Mb. They don't come cheap. The prices are respectively £315, £415, £480, £795 and £995.

But a 160Mb card in a digital camera could store hundreds of high-resolution pictures.

Sandisk, which offers a 220Mb card, has also launched flash drives that fit in standard 2.5in and 3.5in bays. This allows a card from a peripheral, such as a camera or organiser, to be read directly from a base machine.

The drives are also targeted at devices requiring storage rather more rugged than that offered by a hard drive.

[www.sandisk.com](http://www.sandisk.com);

Simple Technology 0135 5350000; [www.simpletech.com](http://www.simpletech.com)

### How first-class post can cost you £1.50

MSN and the Royal Mail are offering a hybrid snail-mail/email service, charging £1.50 to send a single-page letter you could send for 26p first class. Four pages cost £3 and 50 cost £10.

The email is printed out at London's main sorting office and then sent by conventional mail. The RelayOne service is expected to appeal to PC users who cannot, or do not wish to, leave their desks to send a letter to someone without email; or international callers who want to guarantee next-day delivery to a UK address.

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



Short stories

**Avail launches revamped suite**

■ Avail has launched a new version of its low-cost document imaging and management suite. The £59.95 Avail suite comes integrated with Xerox's TextBridge OCR software, enabling you to store and index document images as well as their text translations.

Avail 0033 1 202 0000;  
www.availcorps.com

**Death of money**

■ David Errington, chief technology officer at accounting specialist Sage, has predicted that money, as we know it, will be a thing of the past by 2010.

Errington, who is enabling Sage products for e-commerce and e-banking, says the web will eliminate the need for "tangible money".

www.sage.com

# Lab gives away virtual net code

Code which allows you to access your desktop from any machine, anywhere in the world, is being given away free by



Olivetti and Oracle Research Laboratory (ORL) which pioneered what it calls virtual network computing (VNC).

It would enable you to finish work mid-sentence in Wigan and resume work at that precise cursor position in Timbuktu using

any Java-enabled browser — even on a completely different type of computer.

The ORL, headed by Professor Andy Hopper (*see below*), has been working on pervasive networking systems for a decade.

Prof Hopper said VNC marks the beginning of "nomadic computing on a global scale" and would be of interest to people who have to move around buildings as much as those who move around the world.

He believed that by giving away the first version, "we will help establish an open approach to the next generation of mobile computing." The code can be downloaded from [www.orl.co.uk/vnc](http://www.orl.co.uk/vnc).

● Cambridge-based Cyberlife is developing a simulated Euro-fighter flown by an artificially-intelligent software organism.

ORL 01223 343000; Cyberlife 01223 727001,  
[www.cyberlife.co.uk](http://www.cyberlife.co.uk)

Silicon Valley and Cambridge are forging closer links on a number of fronts, but can the small, overcrowded, hyperactive Fenland technology centre learn enough to survive?

Cambridge engineering and IT students have just returned from a tour of some of the valley's

leading companies, including Oracle, Hewlett-Packard and Sun Microsystems. The tour also took in leading US venture capital companies. It was organised by head of the Olivetti & Oracle Research Lab in Cambridge, Andy Hopper, who has been appointed professor of communications engineering at Cambridge University.

Work presented by students on the tour included research on ultrasonic positioning for use in active office environments.

The problem of getting innovative research to market has brought together town and gown in Cambridge, where there are 1,000 high-tech start-ups. The Cambridge Network, founded by a group including Acorn founder Hermann Hauser, is studying the relationship between Stanford University and the Silicon Valley companies that surround it. The Network is chaired by

## Dons study anatomy of a Silicon Valley start-up

### Caroline Swift continues her reports from Silicon Fen



Cambridge vice-chancellor Professor Sir Alec Broers who, unusually for a man in his position in Britain, has some 19 years working in industry (he was with IBM in the US).

Jim Gibbons, former dean of Stanford's School of Engineering, told Network members in a recent live video link that the heroes of Silicon Valley are entrepreneurs who can start and grow a company.

Successful start-ups there adopt an idea or product from a corporate or university lab and apply market analysis. They need teams of high-quality, dedicated people. These may be from a university R&D team (as was the case with Hewlett-Packard, Cisco and Rambus) or a corporate spin-out like Intel.

Venture capital is the next requirement, with "angel investors" supplying seed funding and emotional support, and venture firms assisting management to create growth.

Funding can also come from large firms with a vested interest in a particular outcome, said Gibbons. Stock options provide a significant opportunity for founders and staff.

Whether Cambridge (or any other UK region) can match Silicon Valley's ability to nourish emerging companies, is another question. Silicon Valley is a huge supply chain, with chip fabs aplenty, easy access to high technology, and lots of space.

Its culture is difficult to replicate, too. In Silicon Valley, failure is okay; at least, if it

happens only once. In the UK entrepreneurs are slapped down if they make a *faux pas*, and the stigma takes a long time to wear off. Stanford's most important contribution is to replenish the intellectual pool with new graduate students. This is a key to Cambridge University's importance, too.

Cambridge faces physical constraints on its growth and will need a sympathetic planning environment if it is to compete on a global scale. But many local companies specialise in communication technologies, so one approach may be to reduce the need for physical proximity.

A new report highlighting the challenge, *Cambridge 2020*, has been written by a team including Sir Alec Broers and Dr Hauser. It is published by telecoms consultancy Analysys at [www.analysys.com/publish](http://www.analysys.com/publish).

# Channelling **energy**

**Susan Pederson looks at very real plans for digital television in Britain. As TV promises to change from the passive to the interactive, who will be the winners?**

**T**he announcement that Britain will soon be getting digital television services left many of even the most hardened TV addicts shaking their heads. Not only will it take you all night to flick through the channels, but how on earth are broadcasters going to fill the programming schedule?

Digital TV does solve one problem, however. TV has historically been a passive medium, and with the exception of Teletext it's very one way. Digital services will introduce interactivity, initially via a standard phone line.

The extra channels can be offered because digital signals require less bandwidth than analogue, even before

compression, so more data can be sent down the line or across the broadcasting spectrum. Most viewers will access them via a set-top box, giving non-PC-owning households their first access to interactive services. Adaptec

has shown a card which will let you access digital TV via your PC; it can be adapted to cable or broadcast TV. Presumably, other manufacturers will follow suit.

Wide-ranging interactive services will be on offer, including home shopping, internet browsing and games. Viewers may be able to choose what language to have a film dubbed in, or what camera view they want to use to see a sporting event. Broadcasters could include trivia quizzes within TV episodes, or let the viewer select relevant topics during the program to get more information. So if you're watching a Katherine Hepburn film, say, you could click on a button to find out more about her life. The possibilities are almost limitless.

But the real problem is getting the signals to the viewers because, although the technology is there, politics still gets in the way. There are three different factions of TV providers — terrestrial, satellite, and, most recently, cable. Cable & Wireless entered the fray by announcing that, in autumn this year, it will launch its own digital TV service incorporating TV-based internet access, a choice of up to 200 channels, a wider choice

of programs on demand and an electronic program guide. It is working with Network Computer Inc (NCI), a joint venture between the browser company Netscape and Oracle, which was one of the leading players behind video-on-demand trials in the early nineties.

NCI has provided the company with the DTV platform, which is open software designed to be set-top box-independent (meaning it can be used with boxes from different manufacturers). One big advantage of the C&W system is set-top boxes will be rented, meaning that more people will be able to afford them. Other cable companies plan similar services. They include ComTel, CableTel and General Cable.

C&W surprised many by ditching Microsoft as a potential partner. Microsoft produces WebTV, a rival to the DTV navigator software. C&W reportedly balked at the fact that WebTV, mirroring Microsoft's activities in the browser market, uses proprietary technologies; the company feared being tied to a particular vendor. C&W, which has 760,000 cable subscribers in Britain, has instead leapt into bed with BT.

BT is backing satellite digital TV in a joint venture with BSkyB (British Interactive Broadcasting). This uses satellites for service delivery and telephones for the back channel: satellite-borne return channels are currently too expensive. British Digital Broadcasting, a joint venture between Granada and Carlton, plans to launch digital services in the autumn using traditional terrestrial TV broadcasting aerials. The company has been talking to ViaCom about providing its channels as part of the service.

NOR.WEB, a joint venture between United Utilities and Northern Telecom, has developed equipment that transmits data along power lines and has already carried out a successful trial in Manchester. UU has revealed that ten international utilities have licensed the technology, a clear sign that it is technically viable. In the UK, the company plans to offer unlimited internet services for a flat fee to residential and small-business users.

As with all emerging technologies, the market is far from homogeneous. The complexity and speed at which deals are being done indicates the potential for rapid market growth. One thing is clear: whoever loses the battle for digital TV and internet services, there will be one clear winner: the customer, who stands to benefit from internet bandwidth far exceeding anything available today, along with a revolutionised TV service. ■



**Sky's computer channel has been renamed .tv. Sky plans to experiment with interactivity in preparation for the launch of digital television in a few months' time**

## Internet shorts

**Commercial gain**

■ If you need commercial information about the internet, head over to Net Profit, a pay-per-view service available on the Mondaq site at [www.mondaq.com](http://www.mondaq.com). The service, scheduled to go live at the end of May, can be accessed with the DataCash real-time credit-card payment system.

**Net car salesman**

■ One-fifth of UK cars will be sold over the internet by the year 2000, according to a report released by business analysts KPMG. AutoLocate, the leading internet car locator service, has sold more than 150 vehicles this way, including a Rolls Royce. Check out the future at [www.autolocate.co.uk](http://www.autolocate.co.uk).

**Net stocks and shares**

■ Internet stocks are holding their own after the share prices of many established PC companies, including Intel and Compaq, tumbled in March. Yahoo! shares rose 36 percent in less than a month, while stock prices for online bookshop, Amazon.com, rose by 31 percent. But nearly 80 percent of the top 25 internet companies have yet to show a profit.

**Wired business world**

■ The government plans to use the internet to help hook up UK businesses with overseas customers. It is hoped that the service, to be run by Dialog Corporation, will help smaller companies take advantage of sales leads collected by UK government agencies abroad.



Literary luvvies should check out [www.prize.orange.co.uk](http://www.prize.orange.co.uk), the web site of the Orange prize for fiction. The shortlist is here, with news, reviews, links and book-world gossip. The winner will be announced on 19th May and will be simultaneously revealed on the web site.

# Compaq risks wrath of anti-trust bodies

Single-click internet access reported as planned for Compaq's next-generation Presario PCs could put the company into conflict with anti-trust authorities, a UK analyst warned.

Search engine group Lycos confirmed that it is discussing new ways to access the internet with Compaq.

Compaq would not comment, but US reports suggest that it is talking to several search and navigation companies to create access to a default web site by pushing a special button on the Presario keyboard.

In bypassing Netscape and Microsoft as partners and negotiating with search engines to establish a standard default site, Compaq could secure a lucrative revenue stream for itself as well as threatening the current pecking order.

Iain Stevenson, head of new media research at Ovum, warned that such a deal would set off the alarm bells at anti-trust bodies, especially if a single search site became the standard default with all Compaq machines.

Lycos admits that it will have a fight on its hands. "These guys aren't going to sit back and watch it happen. Microsoft wants the traffic as much as the next guy and so might have something to say about Internet Explorer being used to access by default a non-Microsoft site," said Corey Eazes, product brand manager at Lycos.

Microsoft was embroiled in anti-trust actions over its bundling of MSN access with Windows 95, at the time of the product's launch.

Simon Robinson, VNU Newswire

## City forbidden to all but the most powerful

■ Think your PC's tough enough? Intel's 3D Internet tour of China's Forbidden City at [www.intel.com/apac/virtualcity](http://www.intel.com/apac/virtualcity) will prove a serious challenge to all but the most well-endowed machines. Because it's designed to showcase the benefits of the Pentium II, anyone with less than a 32Mb 166MHz Pentium had better plan on going in person, or settle for sending a postcard instead.



## Microsoft offers olive branch

Microsoft has offered the hand of peace to the EC over controversial co-marketing pacts with ISPs, agreeing to alter contracts with 30 European and 15 US ISPs. The changes will let ISPs which have deals with Microsoft advertise and promote other browsers like Netscape Navigator.

The EC announced last autumn that it was investigating Microsoft business practices.

Leading UK ISP, Demon Internet, admits it has been put under pressure to promote Internet Explorer. James Gardiner, head of corporate communications, called it "a healthy pressure"

but hinted that Demon's market-leading position may have given it greater leverage. He said there was nothing in its contract to prevent it promoting other browsers: "We could offer IE and Navigator, but we feel it would be too confusing for our start-up customers."

Andy Donoghue, VNU Newswire



## Internet shorts

**Benchmark download**

Get the true measure of your 3D graphics card with a free benchmark utility from Superscape at [www.3dbenchmark.com](http://www.3dbenchmark.com). The test, which runs under your browser, measures factors such as lighting, translucency and texturing. Superscape hopes the benchmark will become a standard measure of 3D performance.

**Privacy laws go public**

The careful and paranoid alike should check out [www.privacylaws.co.uk](http://www.privacylaws.co.uk) from the consultancy Privacy Laws & Business. The site has important information on everything from UK and international data protection laws to privacy organisations, and can also lend a hand with recruitment services, conferences and workshops.



# It's payback time

Network Solutions, which registers top-level internet domain names from all over the world, has come under pressure to pay back some fees paid by non-US firms.

The UK service provider NetBenefit claims that 30 percent of these revenues goes to an infrastructure fund to help build America's next-generation internet and that this gives the US an unfair advantage.

Network Solutions' contract with the US government to register top-level domains expired at the end of March. It is expected

that as competition rises, domain registration costs of org, com and net will plunge.

Describing the old system as "a licence to print money", domain name registrar NetNames announced it would be lowering its fee by £20 to £45. It expects annual registration fees to drop to as little as £10 by the end of this year.

Susan Pederson

(additional reporting by VNU Newswire)

NetNames 0171 291 3000

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

## A write bargain

■ Pick up your pens and pencils at [www.officeshopper.com](http://www.officeshopper.com).

OfficeShopper, a free service from Writeworks, offers over 40,000 office products and uses intelligent software to help buyers get the best deal. Users place their orders directly on the site and receive next-day delivery anywhere in the UK.



## UK Top Ten web sites

The people from design house Town and Country Planning (see illustration, below) have a site that's short on company information but long on style and good looks. There, a quotation from Wells reminds us that in the country of the blind, the one-eyed man is king. Wonder what he would have made of that triumph of tat, Eurovision? Relive the glory, download the songs, then wallow in the shame.

1. British International Motorshow
2. Easy Start Algebra
3. Eurovision Song Contest
4. Heathrow Express
5. Iguana Café and Bar
6. Jackie Brown
7. Millennium Bug
8. Swinton Insurance
9. Think Fast
10. Town and Country Planning

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

[www.gcse.com/Maths/esalg.htm](http://www.gcse.com/Maths/esalg.htm)

[www.bbc.co.uk/eurovision](http://www.bbc.co.uk/eurovision)

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

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

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

[www.open.gov.uk/bug2000](http://www.open.gov.uk/bug2000)

[www.streetwise.swinton.co.uk](http://www.streetwise.swinton.co.uk)

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

[www.motionpixels.co.uk/tcp/index.html](http://www.motionpixels.co.uk/tcp/index.html)



## Stuffy telecomms or big business?

■ British telecommunications companies can be excused for feeling a little bewildered following the release of two competing studies on their internet savvy. Depending on whom you believe, they are, or are not, taking advantage of their skills to gain a dominant position in the internet market.

Claiming that phone companies do not see the internet as high priority, telecommunications consultancy Analysys has predicted that revenues will decline unless the companies lose their stuffy image.

Research from Ovum, however, found that large European providers like BT will become the dominant players in the internet access market and will continue to enjoy high growth, despite their slow start.

Susan Pederson

p47 >

ONE CAN LIVE FOR YEARS AND YEARS  
SOMETIMES WITHOUT LIVING AT ALL AND THEN  
LIFE COMES CROWDING INTO ONE SINGLE HOUR  
OSCAR WILDE

# Ratings plan could steer kids to porn

Net service providers have attacked the Internet Watch Foundation's proposed content-rating system just one day after the government-backed watchdog praised them for cracking down on child pornography.

The IWF hopes to use a voluntary regulation scheme similar to that used in the US to analyse sites and assign a rating. A browser can then filter out unsuitable sites.

David Clarke, md of Virgin NET, warned that far from preventing children from accessing inappropriate material, the proposed system will actually encourage them to search for dodgy sites.

NetNames has compared the IWF's plans to "bailing out the ocean with a spoon", while a Virgin NET spokesperson

said: "There is no magical software that can decide what is or isn't offensive, and there never will be."

But the IWF insists the plan is workable. Chief executive David Kerr said: "There are some organisations around that have a fundamental objection to a ratings system, but the major ones are on our board and funding us. This should not be a barrier."

Kerr acknowledges that standards will vary from country to country, but is confident that a global system can be achieved within the next 18 months. The IWF says that over 2,000 items of child pornography were removed from UK servers in the past year as a result of complaints to its hotline.

Simon Robinson, VNU Newswire

## Ale you need to know

Public-house aficionados can get their fill of hop-related information at the Brewers and Licensed Retailers Association site. Whether you're looking for a guide to pub etiquette for overseas relations, want to investigate the history of inn signs, or are even considering a career in the industry, you should check out [www.blra.co.uk](http://www.blra.co.uk).



### Internet shorts

#### It's no hoax... or is it?

Anyone who has received an email warning them of a virus that will eat their hard drive and steal their lunch, will want to take a look at [www.nai.com/services/support/hoax/hoax.asp](http://www.nai.com/services/support/hoax/hoax.asp) before they head for the hills. The page, set up by virus experts Network Associates, will help nervous users sort the wheat from the chaff.

#### Betting online is a gamble

Online bookies are taking a look at who is placing bets with them after the FBI imprisoned two offshore gambling-site operators and placed arrest warrants for a dozen others in March. US citizens are forbidden to place or receive sports bets on the phone or by electronic means.

#### Good for business

Nildram is offering firms two new ways to get set up on the net. Its business dialup account gives them a standard dialup account, 5Mb commercial web space and a domain name for £360 per year. Customers can plump for the five-user ISDN package for £870 per year.

Nildram 01442 891331  
[www.nildram.co.uk](http://www.nildram.co.uk)

#### Netcenter revamp

Netscape has set up a division to revamp its Netcenter web site to compete with the likes of Yahoo! and America Online. In the last quarter of 1997, Netcenter was responsible for generating about 25 percent of Netscape's earnings and had 3.8 million users.



It's now easier to retrieve banking and financial information from the internet with FinanceWise, a free search engine from IBM and Risk Publications. FinanceWise filters each search and only indexes relevant sites to deliver high-quality, up-to-date banking and finance data. Beancounters should bookmark [www.financewise.com](http://www.financewise.com).

## MS trio of server stuff

Microsoft will expand web-site server offerings with three products that focus on the internet, intranet and data-driven web applications.

In a preview it showed Site Server 3.0, an intranet server for publishing and finding information. Users can access information from a number of sources, including web sites or file servers, or have it pushed to their desktop with IE4's Active Channel.

It also demonstrated Site Server 3.0 Commerce Edition which succeeds the Site Server Enterprise Edition. This helps users to create e-commerce sites and applications, allowing online ordering, management and transactions, as well as analysis of customer buying habits. Visual Interdev 6.0, used to build dynamic data-driven web applications, was also previewed.

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

# The chips are down

So farewell then, the era of the Pentium. Intel's new strategy encompasses four classes of chip, but as Clive Akass warns, the past is hard to shake off.

**W**e are at the end of the Pentium era. Intel is phasing the name out with an emerging series of processors based on the P6 architecture used in the Pentium Pro and PII. The name Pentium, rooted in the Greek word for five, made sense for what would have been the 586 generation if Intel had kept its x86 naming system. It is less apt for the P6 generation — and still less so, Intel believes, for targeting chips in what is seen as a fragmenting market.

Early Intel processors were used for relatively humble tasks, but the market consolidated with the advent of faster Pentiums (those running at 90MHz or above) which were powerful enough for tasks previously done by expensive high-end chips. Curiously, home buyers with their leading-edge games pushed up demand for more processing power in the Pentium era. Now the pendulum has swung the other way: the growth of services such as video on demand and e-commerce is creating a need for mega-powerful servers.

At the same time, chip cloners like Centaur, Cyrix and AMD are challenging Intel in the home and small-business market by offering cheap, highly integrated x86 clones that could eventually make the PC a cheap consumer item. Intel's response is to move from Pentium-style general-purpose processors to a range of chips with specifications (and names) targeted more precisely at particular markets:

● **Mobile** This covers everything from handhelds to trophy notebooks. Intel launched two new mobile PIIs last month; on page 186 we review the first notebooks to use them (see also, *opposite*). Intel has also licensed Strong ARM technology, which gives it a toehold in the appliance/

organiser market, although it is keeping quiet about plans.

● **Basic PC** This is the market the cloners are going for, and despite some supply problems they are getting big backing from the likes of IBM. Intel launched its cacheless Celeron into this market; a cached version expected later this year is likely to offer more effective competition.

● **Performance PC** The entry-level server, workstation, or enthusiast's PC. Intel launched 350MHz and 400MHz PII versions for this market on 15th April, with the BX support chipset ready for the new 100MHz system bus. Early 400MHz PCs are reviewed on page 212.

● **High-end PCs** An as-yet unnamed product, using the new Slot 2 architecture, will be launched later this year.

More details of these chips and their rivals are on page 214. A watershed will come next year with the launch of HP-Intel's Merced, which shifts gear to 64-bit operation. It has a parallel in the 1985 launch of the 32-bit 386, when applications and hardware began to shift from 8-bit and 16-bit to 32-bit. Thirteen years later, that transition is still not complete: Windows 95 is a 16-bit/32-bit kludge.

Windows NT 5.0 will, initially at least, sit between 32-bit and 64-bit stools. Until Merced arrives, only the version compiled for the Digital Alpha chip will be able to use 64-bit addressing. (VNU Newswire's *Mike Magee* reports that Intel will use a processor codenamed Tanner to ease customers from 32-bit to 64-bit operation.)

The 386 had an advantage not shared by Merced: just about everyone needed it. The PC at the time was moving from a text-based to a graphical interface, demanding seriously more processing power. But 99 percent of today's general office work can be done happily on an entry-level Pentium. So, those cheap clone chips could win some of Intel's lucrative business customers as well as home users.

The multi-billion-dollar question is whether applications will emerge to create a mass market even for the 1998 generation of fast processors. High-definition video and virtual reality will use all the processing power they can get, but the work will not necessarily be done by the central processor. Intel is also being squeezed by the makers of fast specialist chips.

And Intel is shackled to the past. Its need to maintain x86 backward compatibility gives an edge to rivals like the Alpha; x86 support is expected to be dropped in Merced's early next century but not in other PC chips. Like human DNA, the computers they power will retain indefinitely the code of their most distant evolutionary antecedents. ■

	0.35 micron PII	PII	0.25 micron Mobile PII	Celeron
Processor MHz	233,266,300	333,350,400	233,266	266
L2 cache size and speed	512Kb	512Kb	512Kb	0Kb
	0.5 core	0.5 core	0.5 core	N/A
System bus	66MHz	66/100MHz	66MHz	66MHz
	Slot1	Slot1	Slot1	Slot1
Chipset	440FX,440LX, 440BX	440LX, 440BX	440MBX	440EX
Voltage	2.8	2.0	1.7	2.0
Wattage	34.8, 38.2, 43	23.6, 24.5, 27.9	10.6, 12.1	16.7
Package	SECC*	SECC	Mobile module or mini-cartidge	SEPP**
MMX	Yes	Yes	Yes	Yes

\*Single Edge Cartridge Connector \*\*Single Edge Processor Package



# Planet mobile

**Tim Bjarin reports from Mobile Insights and particularly on Intel's plans for mobile chips. Plus, Intel is reaching for the stars with Jupiter-class handhelds.**

**T**he Mobile Insights conference is the only serious industry event that deals with the future of mobile computers. The hot topic this year was the introduction of the two new mobile Pentium II chips running at 233MHz and at 266MHz. They are important for two reasons: Firstly, Intel aims to get mobile chips out as fast as possible. In the past, it has taken as much as a year to introduce mobile versions of desktop processors. This lag has dropped to about six months, but Intel expects to have a 300MHz mobile Pentium II out later this year to keep the power curves on each platform as close as possible. Secondly, Intel wants to begin moving today's laptop owners over to the Pentium II design and maximise the use of this generation of chips for at least two more years.

So, Intel is apparently being pretty aggressive in pricing these PIIs to tempt users to make the move quickly. I hear that one vendor will bring out a 266MHz PII system with 64Mb of DRAM, a 13.3in screen and 4Gb hard drive for as low as \$3,500. This is extremely aggressive and will cause a serious pricing problem for most of the other notebook vendors from the start.

This pricing may change corporate attitudes to portables. A powerful notebook at \$3,500 makes an attractive desktop replacement where people need the flexibility of working at home as well as in the office, especially as using the same computer at both locations eliminates the tricky problem of synchronising data on different machines.

Another hot topic at the conference was the expected introduction of Windows CE 3.0 and Jupiter systems, Microsoft's codename for CE-based mini-notebooks.

This new version of CE 3.0 finally addresses full 640 x 480 displays and will be deployed in products that are two to three times larger than today's handheld PC (HPC) platform. The new designs are being referred to as

A few months back I alerted you to the Sony 505 Ultra subnotebook. It was a major topic at the Mobile Insight conference and Sony showed it off proudly. When it comes into the US in May, this 0.75in thick, 2.2lb system will sport a 200MHz Pentium and a 10.4in screen and it will cost about \$1,995.

From the reaction of the crowd at the conference, this could be a bestseller small notebook by the end of the year. It is unclear when Sony will offer this same unit in Europe, but it knows it has a real winner on its hands and is trying to ramp up production as fast as possible. Best guess is that a model will make its way into the UK by Christmas.

ultra sub-notebooks or micro notebooks and weigh less than 31b. They will cost \$1,000 or less, making them ideal for a host of mobile applications.

I'm already getting familiar with this form factor thanks to NEC's MobilePro 700, a device that reminds me of the original Poqet PC. It weighs less than 2lb and has a 9in x 5in dual-scan screen. It gets over ten hours out of a battery, yet has a real keyboard. The best part is that I have a real email client on it as well as full web connectivity thanks to Pocket Internet Explorer. I have to do a bit more scrolling on the web, but I get the entire page, including graphics, at all times. I also find that I can write on this unit, making it ideal for people who only need to do email and access the internet.

At my company, Creative Strategies, we've just finished a survey of MIS directors who manage mobile users. They told us they are starting to divide users into two categories: the creators, who do large spreadsheets, presentations and serious word processing; and people who need a mobile device only to access information. Up to seven in ten users will be in the latter category. The managers questioned the need for a \$2,000 or \$3,000 laptop, for users can get by with less powerful mobile devices. This has serious ramifications for notebook vendors. Today, 50 percent of their sales are in laptops that cost over \$3,000 and have high margins. If the market moves towards low-cost Windows systems, their fortunes could change. Indeed, most of the mainstream vendors are hustling to create Jupiter-class Windows CE 3.0 systems.

This could cause a sea change in mobile computing. It would force the vendors to start peddling high-end products as desktop replacements; if they get the docking concept right, they could make the current desktop obsolete. It will also push mobiles to many more users.

The Pilot has already found its way into major MIS organisations through the back door. A Jupiter-class device with Windows CE 3.0 and mainstream functionality could actually come in the front door if it is priced right and pushed as a real extension of the desktop. ■



**The new Mobile PII chips come in daughtercard and cartridge formats**

# Quake 3 supercharged for Voodoo2 graphics

Quake 3 is about 18 months away and will run only with hardware acceleration, according to programmer John Carmack of developer id Software.

The game will combine existing Quake II

architecture with an expansion pack and a new graphics engine.

The best performance will come from a 3Dfx Voodoo2 chip with 12Mb of dedicated RAM, Carmack said in a statement.

Colin McRae Rally is the new racing game (pictured, right) that everyone is raving about. Due to launch this summer, it claims to be the most authentic world rallying experience. Watch out for a review in Screenplay.

Pssst... A little birdie tells me that Microsoft is planning the launch of Age of Empires II, the sequel to the award-winning strategy game Age of Empires. The new game, expected to be released in October will keep the epic scope of the Age of Empires gameplay while evolving the combat, economic, trading and diplomacy features as well as the user interface.

Also from Microsoft is Monster Truck Madness 2, which will be in the shops soon. The new game will have nine new trucks with crushable bodies, ten new tracks and improved graphics. Prepare for destruction and doom on earth.

Golf games are popping up everywhere these days. Real Golf is a new shareware game in which computer golfers can play a realistic round of golf with others over the net.

The game costs nothing to try and is available for download at [www.realgolf.com](http://www.realgolf.com). We will be reviewing some of the latest golf games in Screenplay



next month.

● Turn to this month's action-packed Screenplay on page 316 for previews of Wreckin' Crew and Armor Command, and reviews of CART Precision Racing and Battlezone.

## Short stories

### Programming out of Toon



■ Marty the Martian is just one of the characters in a new software package which claims to enable children to learn how to program without their being aware that they are being taught.

Toontalk, from education specialist Logotron Schools, puts them into a 3D computer world. The package is designed to support the modelling, measurement and control strands of the IT National Curriculum. ToonTalk costs £44 (ex VAT).

ToonTalk [www.logo.com](http://www.logo.com)

### Free web access

■ We inadvertently gave the wrong address last month for the site offering free web access. The correct address is [www.x-stream.com](http://www.x-stream.com)

## Top 10 Games

		Last month
1	Tomb Raider 2	Eidos 4
2	Jedi Knight: Dark Forces 2	Virgin -
3	Battlezone	Activision -
4	Grand Theft Auto	BMG 1
5	Championship Manager 2 97/98	Eidos 3
6	Quake 2	GT Software 5
7	Tomb Raider 2 Limited Edition	Eidos 4
8	Lula The Sexy Empire	Take 2 -
9	Duke Nukem 3D Premier Collection	Eidos -
10	Syndicate Wars Classic	EA -

## Top 10 Windows software

		Last month
1	MS Win95 UG + IE 4	Microsoft 1
2	Nuts & Bolts 3.1+95	Xatlantic 7
3	MS Office 97 Stand V/comp	Microsoft 9
4	MS Encarta Reference Suit	Microsoft -
5	MS OfficePro+Bookshelf U/G	Microsoft 4
6	Norton Anti Virus v4 Deluxe	Symantec -
7	MS Encarta Deluxe 98 CD	Microsoft 5
8	Partition Magic v3	PowerQuest -
9	Dr Solomon Anti Virus	Dr Solomon -
10	MS Frontpage 98 FP CD	Microsoft 10

## Top 10 DOS software

1	DOS 2 Win UG with internet	Microsoft	2
2	Supercalc v5.5 for DOS	CA	-
3	Turbo Pascal v7.0	Borland	9
4	MS Mail PC Remote 3.2	Microsoft	7
5	MS DOS v6.22 UG	Microsoft	4
6	System Commander v3.0	POW	1
7	Procom for DOS	Datastorm	6
8	MS WFWG 3.11 Base	Microsoft	3
9	FSFX UG for MS Flight	Microsoft	-
10	MS Back Office SVR v4	Mico	-

## Top 10 CD-ROMs

		Last month
1	Virtual Springfield	Fox Interactive -
2	Simpsons Cartoon Studio	Fox Interactive -
3	Babylon 5: Ultimate Reference	Cendant 1
4	Organic Art Replay	GT Interactive -
5	Dogz 2	Mindscape -
6	3D PC Pup Pet	Neechez -
7	Encyclopedia Britanica	Acclaim 2
8	Catz 2	Mindscape -
9	Babylon 5: Shadow Wars	Cendant -
10	Music File 98	File Productions 4

## Top 10 Peripherals

1	Umax Astra 610p	Umax	1
2	USR Sportster Flash Ext	USR	2
3	HP ScanJet 5100C	Frontline	3
4	Umax Astra 610s	Umax	4
5	USR Sportster message+Ex	USR	6
6	Umax Astra 1210p	Umax	-
7	Umax Astra 1200S	Umax	5
8	MS Sidewinder Gamepad	Microsoft	-
9	MS IntelliMouse v3.0 (95)	Microsoft	-
10	MS Sidewinder Precision Pro	Microsoft	7

PCW's Susan Pederson reports from the CeBIT show in Germany



**CeBITs and pieces**

**High-tech road runner**

■ Cruising the information superhighway took on a whole new meaning at the IBM stand this year. Billed as the car of the future, the Network Vehicle demonstrated potential technologies including speech recognition, a global positioning system, internet connectivity, anti-theft, emergency and repair diagnostic systems, as well as games and TV for the passengers.

IBM 001 (416) 383 5161  
[www.alphaworks.ibm.com/networkvehicle/index.htm](http://www.alphaworks.ibm.com/networkvehicle/index.htm)



**Screen in a spin**

■ Fujitsu's stylish and space-saving LCD-PC, coming this autumn, could change the face of home computing as we know it. The all-in-one 233MHz Pentium system has a 13.8in LCD flat screen that rotates to let users work in portrait or landscape mode.

Fujitsu 01344 475555  
[www.fujitsu-computers.com](http://www.fujitsu-computers.com)

**Optiplex pulls Zip**

Iomega has struck a deal with Dell that will see its Zip built-in drives placed in the Optiplex line of corporate desktops. It says the "huge installed base" of Zip drives which offer 100Mb storage capacity, make it a shoe-in for easy high-capacity data access.

Iomega 0700 0466342  
[www.iomega.com](http://www.iomega.com)

# IT one degree under at Hanover

While CeBIT usually has a theme, this year the massive German fair in Hanover failed to come up with anything that could remotely be described as holding the whole show together.

The show is always somewhat schizophrenic because of its size. Hardware, software, networking and telecom companies all had a large presence, but many were grouped together in one or

more of the 26 halls. This gives the show something of a confused air. It was even more noticeable this year, when the industry was fragmenting around several new crazes including thin clients, Java, whizzy chips and mobile phones.

While the halls that contained the semiconductor and hardware vendors seemed less than usually busy, the software hall was packed with people and buzzed

with activity. However, the impression remained that CeBIT 1998 was more subdued than normal.

Although the organisers insist that attendance levels were as high, or higher, than last year, there seemed to be a mood of uncertainty.

If CeBIT is a barometer of the general state of the IT industry, then in the cold, raw wind of Hanover, pressure is low.

**Mike Magee**  
**VNU Newswire**

## TV topper

■ SurfTV, a set-top box from ComOne, turns your TV into a complete communications centre. Users can send and receive faxes and emails or browse the web using the infra-red keyboard, or use it as a telephone and answering machine. Expand it with a CD-ROM or DVD player, or add a video camera and check whether the kids are asleep upstairs, or if they're cunningly playing Tomb Raider with the sound turned down.



## Low angle for digital cameras

■ Digital cameras, all the rage at last year's CeBIT show, kept a lower profile this year. Perhaps vendors are still trying to work out

how to turn on the public to these expensive items?

Agfa was one of a few to unveil new products, which included the ePhoto 780 and 1280.

The 780, aimed at the lower end of the market, has a 350,000-pixel CCD sensor and will retail at about £400. The professional 1280 can reconstruct

pictures to generate images up to 1.228 pixels and may sell at around £700.

Sony concentrated on the videoconferencing sector, showing off a couple of professional video cameras.

Olympus introduced its £79.99 dimo (pictured, left), a small storage device that links the camera to the MO drive and can store up to 1,000 images.

Agfa 0181 560 2131, [www.agfa.com](http://www.agfa.com) / Olympus 0171 250 4616, [www.olympus.com](http://www.olympus.com)





# CeBIT giants urge us to get on and get down to e-business

If there was a buzzword at CeBIT this year, it was e-commerce. Not only did IBM devote a large portion of its monolithic stand to promoting the concept, but the head honchos of several major corporations also scrambled over themselves to announce that the time had come to get serious about business online.

Intel predicted that small businesses, which make up 56 percent of Western Europe's economy, would power the e-commerce boom in Europe. European chief Rob Eckelmann forecast that Western Europe's total online sales will rocket to US\$26bn by 2001, up from only \$3bn this year.

In his keynote speech with Germany's Chancellor Helmut Kohl, IBM chief executive Lou Gerstner hazarded that the global e-commerce market would reach \$200bn by the turn of the century. But he called for an end to restricted encryption and argued against imposing e-commerce taxes, saying that these were stifling a budding market.

Finally, Lotus president Jeff Papows urged companies to waste no time in setting up shop online.

He said: "The question companies ask themselves should no longer be 'Is it time to start thinking about e-business?' They should



ask, 'What is the best way of implementing an e-business?'"

**Susan Pederson**  
(with additional reporting  
by VNU Newswire)

## New monitors on display

■ Proclaiming "tomorrow's world is flat", Sony unveiled a 15in LCD monitor (pictured, right) that can squeeze onto even the most crowded desk with ease.

Just 165mm deep, the CPD-L150 supports more than 16 million colours and delivers bright images with little reflection. It also requires less than a third of the power of conventional cathode ray monitors. If you're still tight for space,

the base can be removed and the monitor either mounted on an arm or hung on the wall. The unit will appear in July with a suggested retail price of £1,800 ex VAT.

Fujitsu had a new 15in TFT monitor on display, the x150f. It has a lightning-speed response time of only 25ms. It is the first monitor to have a super-wide 160° angle of view, horizontally



and vertically, making it a viable option to a 17in cathode ray tube monitor.

Sony 0990 424424,  
[www.sony-europe.com/forum/march\\_19\\_25f.html](http://www.sony-europe.com/forum/march_19_25f.html)  
Fujitsu 01344 475555,  
[www.fujitsu-computers.com](http://www.fujitsu-computers.com)

## Encryption prescription

■ Imation announced encryption software to protect its data storage products. The encryption-enabled SuperDisk allows PC users to protect access of up to 120MB of sensitive or confidential information on a single diskette. Any file running under Windows 95 can be protected.

Imation 01344 402200; [www.imation.com](http://www.imation.com)

### CeBITs and pieces

#### New floppy, flash chip

The floppy-disk format got a shot in the arm when Sony revealed its new 200Mb floppy-disk system, the HiFD.

The HiFD drive has a transfer rate of 3.6Mbps and can fit into existing 3.5in floppy-drive bays, although an external version is also available. The drive can read and write conventional 3.5in disks as well, and will begin shipping in the third quarter of the year.

The record book was also rewritten for flash chipsets with the announcement of SanDisk's 128Mbit storage chip. The new chipset will be used in devices like internet appliances and handhelds.

Sony 0990 424424,  
[www.sony-europe.com/forum/march\\_19\\_25u.html](http://www.sony-europe.com/forum/march_19_25u.html)  
SanDisk (Peak Development)  
01489 796979,  
[www.sandisk.com](http://www.sandisk.com)

#### Palmistry

While Microsoft kept its controversially named PalmPC at a low profile at this year's show, PalmPilot fans lined up to catch a glimpse of 3Com's next-generation organiser.

The Palm III has been redesigned to include a protective flip cover and a metal stylus. Running on the new Palm OS 3.0, it offers an infra-red beaming system to transfer data from one unit to another. It comes with 2Mb RAM and users also get a CD-ROM with a wide range of goodies including drawing applications, games, and desktop applications such as Outlook 97.

The Palm III is expected to appear at the £300 mark and a money-back upgrade deal is in the works.

3Com 0800 225252,  
[www.3com.com](http://www.3com.com)

#### Groupware previews

A sneak preview of Lotus Notes 5.0 and Domino 5.0, due to ship in the third quarter, was given in Hanover.

Lotus Notes 5.0 allows users to use Headline Pages to customise the interface and filter out unwanted incoming information. Meanwhile, Domino 5.0 offers connectivity to handhelds such as the PalmPilot and Windows CE devices.

Lotus 01784 455445  
[www.lotus.co.uk](http://www.lotus.co.uk)

Over the years, one develops a number of fast-track techniques for getting press releases quickly from the doormat to the waste-bin. With practice, it's possible to tell PR stuff from real mail just by looking at the envelopes. Some slip through, though. This one, for instance: "Prestel discovers 'new man' on the internet", reads the headline. So *that's* where he went.

It goes on to say that, far from being the preserve of "immature, laddish, carefree males...", the net is predominantly populated by "...young men with a more sensible approach to using the information. [They] favoured surfing educational web sites above net pages involving sport, games, humour and music." Really? Surely they're joking.

What reasons do I have for supposing that this "profile of the average web user" is, in fact, total cack? Quite a few. For a start, the sample number (just one hundred) is ridiculously low. Even Kit-E-Kat needs at least a thousand before it can confidently announce that nine out of ten cats are giving its product the thumbs up. Besides, if someone asks, out of the blue, the average nerd what he uses the internet for, is he more likely to reply (a) "Mainly for browsing the hardcore sites, downloading pictures of Pamela Anderson, naked, and taking part in adult newsgroups"? Or (b) "I use it to enrich my intellectual life and am particularly keen on reading the online versions of The Times and The Daily Telegraph"?

The Prestel survey contrasts markedly with one carried out recently by Stanford University. They analysed the data fed into AltaVista and Excite and discovered that the most common search terms were "sex", "nude", "pornography", "lesbian" and "hardcore." I don't know how many "hits" those are going to bring up but I'd venture to suggest that the online version of *Forbes Business Monthly* isn't likely to figure highly among them. Nor any of those academic sites that Prestel claims are favourites with the online community.

The internet was originally designed to be a nuclear bomb-proof communications system. It may well still be; thankfully, no-one has yet tried to prove otherwise. But if, say, Saddam Hussein really wanted to spoil the Western world's day, he wouldn't need a bottle of duty-free L'Air du Temps full of anthrax. All he'd need to do would be to announce that he'd got a web site with naked pictures of Jennifer Anniston. Then he could stand back and watch as the entire teenage male population logged on to the net and brought it, including international business transactions, defence files and so on, grinding to a halt.

More garbage circulates around the internet than ever reached my municipal dump. It's precisely because of all the stuff that's on there, slowing everything to a crawl, that I can't believe the Prestel survey.

Eighty percent of users read the online versions of *The Daily Telegraph* and *The Times*, claims Prestel. Oh, please... *The Daily Telegraph* put its paper online for just

the same reason that Hilton put a hotel in Croydon. They know perfectly well that no-one will salivate over the prospect of going there. It's to up the numbers, to say they've got a presence in the area. Likewise with newspapers on the net: they can boast that they're part of the "online revolution" that's supposedly transforming our lives. But given that it's on there, why can't you read an online newspaper as you would the regular version?

Someone once said that there's nothing as old as yesterday's news. There is, you know: news on the internet. Several online newspapers carry stories that go back months. It seems to me that they're updated infrequently, if at all. But what of the UK online dailies? Yes, they carry the day's current stories — if you're prepared to sit and wait upwards of 30 seconds for just one feature to assemble itself on-screen. I don't have the patience. In the time it would take to read the entire paper online, I could go to the newsagent, buy the genuine article, go through it from front to back, do the crossword, and relax over a cup of coffee afterwards.

The same sluggishness that makes reading online newspapers near impossible, also renders the internet highly impractical as a serious research tool. People often describe it as the world's greatest reference library. It is, I suppose. But only if your idea of a reference library is one whose record cards are scattered haphazardly all over



Michael Hewitt

## Sounding Off

*'New man' is on the internet: Really? Oh no he's not, says Michael Hewitt. 'The lads' still rule and the internet is impractical as a serious research tool.*

the building, whose stacks and corridors are packed full of thousands of pustulent adolescents thumbing through every book looking for the "dirty bits", and whose management can suddenly, unannounced, shut down the whole place "for maintenance".

The internet is useful for sending and receiving email. It does that perfectly. As a research tool, however, and as a source of readily available, topical news material, it's become virtually unusable. It isn't even particularly efficient at delivering pornography any more. But I bet I'll never get a press release telling me that.

[Mike.hewitt@mjh1.demon.co.uk](mailto:Mike.hewitt@mjh1.demon.co.uk)



**S**oftware is getting worse," complained a colleague who had wasted a weekend trying to get his Windows CE handheld to work with CompuServe. I had raised the same issue with the Philips CE development centre in the US last year and also asked how to use the handheld with AOL. I got blank looks.

Over many months I have put a string of questions to Psion about the comms software for the Series 5, carefully logging the error messages which come up when the wretched thing offers to convert imported database files to Psion format and fails. Psion's only response has been to offer new versions of the same software, which suffer the same faults. Now Psion wants me to visit and talk. What's the point? If it's my PC that's to blame and I really am the only person in the world to suffer these problems, Psion must come to visit *me*. The ball's in Psion's court.

After my complaints to Adaptec about the Easy CD Pro software that is supposed to make it easy to record music on CD-R blanks, I was sent Easy CD Creator Deluxe. This boasts lots of new features but collapses in a heap of Illegal Operation error messages, making it unusable. Adaptec claims such reports are "very rare". But there is already an upgraded version which I will now have to try. Why? Because blank consumer CD-Rs, needed for music CD-Recorders, cost nearly £5, while the price of blank CD-Rs for PC use has now fallen to under £1. When it works, Easy CD records music on a PC with computer blanks. So it's worth giving it another try.

BT continues to charge an absurd £200 for the Phone Disc CD-ROM. The search software is so unfriendly that Marks & Spencer can only be found by entering Marks Spencer. Entering Marks and Spencer finds no entries, and the system will not allow the user to type "&". A couple of years ago, German software company Topware optically scanned BT's paper directories and launched the rival "UK-Info" for £20. BT sued and UK-Info vanished. Now an updated version is available from I-CD in Hampshire. A recent issue of *PC Format* magazine covermounted UK-Info for £5 and promised "a staggering 42 million surnames, initials and street names, plus phone numbers for virtually every UK citizen". "Never call directory enquiries again! Throw out all your old phone books... track down people's phone numbers in seconds," promised the blurb.

I gladly paid my fiver, installed the disc and searched on names I knew should be listed. UK-Info denied their existence or gave no phone number. The magazine and disc gave two helpline numbers. One was solidly engaged. The other rang and rang, before answering with voicemail. An email to the support address produced no reply, then I tried a FAQ which did not answer my question: does the disc actually work as claimed?

The disc offers the chance to upgrade to the "Pro" version of UK-Info for a special price of around £180;

no thanks, I won't. And neither, it seems, will many other people. Info-UK has a web site for its own directory enquiry service <[www.192.com](http://www.192.com)> and hosts an electronic bulletin board on which users can post their frank opinions of the disc. Most are too frank to republish here (e.g. comparing the ROM unfavourably with garden fertiliser).

A while ago I wrote how HP's LaserJet 4L had a new and undesirable feature. As soon as the printer is disconnected from the mains, it resets to factory defaults; previous HP LaserJets could store a user's preferred setting as a default. HP could offer no help on how to get the 4L to power on with selected settings. Now, purely by chance and with no thanks to HP's dozy front-of-house people, I've found the answer. The software that comes with HP's 6L printer has the option to load the user's selected default into the printer each time the PC is powered up. So, I tried the 6L software with the 4L and it works perfectly.

Financial Times Television (FTV) and the London Business School recently joined forces to release "the first-ever Hi-CD". It plays audio on a CD player and MPEG-1 video on a PC. The disc loads Microsoft's Active Movie software decoder, which promises decoding on a P120 and upwards. I physically uninstalled my MPEG hardware decoder to give it a fair try but never succeeded in getting sound with pictures, even though



Barry Fox

## Straight Talking

*I don't believe it!* Barry Fox's 'customer complaints' fist strikes Psion, Adaptec, UK-Info and FTV among others. But there's good news on an HP LaserJet fix.

another software decoder, SoftPeg, performed perfectly. If you have paid the asking price of £30 for the *FT*'s Management Practices Disc and cannot get sound with your pictures, don't let anyone tell you that you are the only person to report a problem. FTV said it was asking Microsoft for advice and would get back to me. That was three months ago...

Do things always have to be this bad? No. Next month I'll report on a clever idea and some smooth-working software that lets a PC read and write smart-card and memory-card data via a standard floppy drive. [100131.201@compuserve.com](mailto:100131.201@compuserve.com) ■



**F**or a long time, the members of IT departments have had the sneaking suspicion that they are second-class citizens. It's not surprising when you think about it. The message that companies have been sending is very clear. "We are a car manufacturer (or an airline or a bank), not a computer firm. That is our core business and it makes you an overhead. You aren't involved in what the company does; you just support it."

This approach has had some grim consequences. IT employees feel unimportant. IT managers try desperately to become managers of a car manufacturer (airline or bank), not IT managers, with the result that many do not understand what their people do and lose the respect of their staff. And companies feel happy to outsource their IT or sell chunks of the department to third parties.

For junior managers in IT, things can be even more depressing. IT often doesn't have a traditional management structure. There's the need to reward superb technical staff to keep them happy because you are hugely dependent on the skills of a relatively small number of people. This means putting IT staff who aren't really managers onto a managerial grade because large company pay structures aren't geared up to rewarding the workers with loads of dosh. Then, suddenly, a period of cost-cutting arrives. The company wants to reduce management headcount because managers are expensive. It looks at the IT department. "Too many managers" is the cry. "Let's move all these people, who don't have lots of staff reporting to them, off managerial grades. We'll save a packet."

Sadly, such is the folly that overcomes large firms once the cost-cutting bug is caught. Because this move actually wastes money. The theory is that all these pseudo-managers will lose their management perks — for junior managers, worth maybe £3,000 a year. Unfortunately, it overlooks the fact that managers don't usually get paid overtime. Staff do. These people are working 60-hour weeks for no extra pay. Suddenly you are paying them £15,000 a year in overtime. Great savings, guys.

At the same time, surprising though it may seem given these figures, you've totally de-motivated them. The reason they were doing those 60-hour weeks for no extra pay was because they knew they were important to the company, and it was important to them. Now it has demoted them; always a dangerous course of action. So now there's a group which is doubly demoralised, both by the way the IT department is regarded and by the way in which they've been treated.

You might be thinking by now that this is all very well and we're deeply sorry for these IT people — or at least we would be if they weren't grossly over-paid — but there's not a lot that can be done about it. After all, the initial premise is true: computing isn't the core business

of an ordinary company; these aren't front-line staff. There is, however, a way around this dilemma, an approach to which I give the rather fancy title DisOrganization. The way most companies are organised dates back 100 years and simply isn't geared up to the needs of the 20th century, let alone the 21st. When our current ideas of running a business were established, information technology was about devising a better filing cabinet. I believe there is a need for radical change. The way that companies are put together needs revisiting.

Imagine a firm split into mini-companies, each comprising no more than 50 people, co-ordinated by a small central group. The overall business pulled together by this central group would include both mini-companies which were part of the same organisation, and independents, there being no distinction between internal and external partners.

The significance of this approach for the beleaguered IT department is that the staff of the new IT mini-companies *are* front line because they work for IT companies. The real central business of their mini-company is IT. With special expertise in a particular customer area, certainly, but IT nonetheless. Self-esteem returns. Managers have to understand IT. There's no need to conform to a company-wide idea of what a manager is. And there's all the excitement and flexibility



Brian Clegg

# Business Matters

IT staff should not be treated as second-class citizens, writes Brian Clegg. They are important to their employer. He puts forward his idea for radical change.

of working for a small company with big company benefits, too.

I have to confess to a personal interest in this concept, having co-authored the book *DisOrganization* together with Paul Birch. It is published by Pitman and should be out around the time you read this. But I am sure that the approach is the only one that will stop companies from losing the immense value of good in-house IT departments, turning them once again into effective business weapons. For a few companies, it's too late. But for most, there is still time to DisOrganize.

[brian@cul.co.uk](mailto:brian@cul.co.uk)





Tim Nott

One of the truly fun things about owning a PC is all the stuff you can plug into it. I've got a modem, a mouse, a scanner, a drawing tablet, one cable which connects to a portable and another that connects to a digital camera. All but the scanner plug into a standard serial port. Given that first, my PC, like most, has just two serial connectors, second, that the mouse is indispensable for working in Windows, and third, that in order to stay in touch with the rest of the world, the default resident of COM 2 has

to be the modem; any time I want to play with the other goodies I have to power down the PC and crawl beneath the desk unplugging and plugging before powering on again. A process that is almost as lengthy as that last sentence but at least you only had to read it once.

There must be a better way. I've often wondered why the PC industry hasn't looked earlier at the model for domestic power distribution, where you don't have to unplug the fridge in order to vacuum the carpet, nor plunge the entire house into darkness before plugging in the telly. And, indeed, there is a better way. It's called the Universal Serial Bus.

Nearly all the PCs you buy today have USB sockets and these are the answer to the prayers of anyone who has ever struggled, peripherally. First, you can have lots of them. Second, you can have them where you want them: in "hubs" that can be part of a monitor, keyboard

# From the desktop

Tim Nott sings the praises of the Universal Serial Bus. For the peripherally-challenged, desperate for things to hang off your PC, the USB is the answer to your prayers.

or standalone. Third, the cables can carry not only data, but power, too. Fourth, you can plug and unplug devices at will: just like a vacuum cleaner or TV. Fifth, you no longer have to mess about with IRQs, I/O ranges, DMAs, jumpers, DIP switches or any of that other nonsense. Sixth, USB is ten times as fast as a standard serial connection. And seventh? Well, if you're not already jumping up and down waving your chequebook, you must like crawling around the desk, sorting out interrupt conflicts.

The good news is that there is no shortage of USB ports: they come as standard on most new PCs and are

starting to appear on monitors, too. The bad news is that there seems to be a dearth of things to stick into them.

I went in search of the peripheral in the vendors' conference on CIX. Not only are these people extremely knowledgeable about PCs, but they also have up-to-date grass-roots knowledge of what's selling. I asked: "What USB peripherals are really flying off the shelves?" This drew a blank, and after a few abortive exchanges I rephrased this as: "Has any vendor sold any USB peripherals, at all, yet?" This also drew a Zen-like silence.

So what is there? KeyTronics has been producing a USB keyboard for two years, and a USB version of the Microsoft Natural Keyboard (made by KeyTronics) has just been released. This does not act as a USB hub, though, so you can't do the next logical thing and plug a mouse into it. Cherry also makes a USB keyboard, this time with a hub, but not for its top-of-the range ergonomic model. Logitech and Microsoft have mice breeding for release later this year, as well as joysticks.

More on the fun front will come from Philips later this year with an infra-red multiple gameport interface for PC and TV, and both Thrustmaster and Spacetec are fielding USB game controllers. On the dealers' shelves now, though, is a neat USB scanner, the Logitech PageScan, and US Robotics has a USB modem. Kodak, Pace, Philips and others have cameras aimed chiefly at the videoconferencing market, with Intel and Polaroid ready for a joint effort "sometime in the second half of 1998".

Digital USB speakers are already a reality from Altec Lansing and Philips, with Telex offering a USB microphone. On a more exotic front there's Digital Persona's Cyberego. This transfers log-in issues from passwords to fingerprints, scanned by a small desktop device and matched against a database of authorised users. There are several telephonic solutions around, notably from Mitel, Nortel and Lucent, though these have yet to surface in the UK. And in case you were wondering what to do with all those old serial devices, don't panic. The Edgeport/4 is a hub that will squeeze four conventional serial ports into one USB port. Bad news, however, is the cost: at \$399, it may be cheaper to replace the peripherals.

Despite these examples, USB peripherals have seen minuscule market penetration. USB support is already available as an add-on to Windows 95 and will be standard in Windows 98. Let's hope that the latter gives USB a badly needed boost. It's much too good to waste. Contact [www.usb.org](http://www.usb.org) for a (not very up-to-date or comprehensive) report on the state of the art.

#### • Correction

In May's column Tim mentioned that *Le Petit Prince* CD-ROM was unavailable in the UK. I've since discovered that you can find it at Grant & Cutler, 55-57 Great Marlborough Street, London W1V 2AY. Phone 0171 734 2012 [www.grant-c.demon.co.uk](http://www.grant-c.demon.co.uk) ■



# 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!

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You won't regret it.

#### What's it to Be?

As a subscriber to your magazine I always read with interest your columns relating to operating systems other than Windows 95. While I doubt that I would ever completely move away from the Windows platform, I must confess to an urge to try something different.

It was with great delight, then, that I wandered into Be's web site and read of its (at the time) intention of writing an Intel-based version of its Mac OS. As a mature student studying multimedia computing, this was of real interest to me as Be promotes its OS as having been designed to run multimedia applications and to supposedly offer superior performance to existing OSes. Will you be reviewing it now that it has been released for sale? Also, if the OS is everything that Be says it is, will there be a column in PCW devoted to it in the future?

**David Cochrane**  
[davidcochrane@clara.net](mailto:davidcochrane@clara.net)

*Good news, David. We have just received a reviewable beta of Be OS and plan to do a full review in our next issue, July 1998. If demand is there, we will certainly consider regular editorial coverage.*

#### A few dollars more

I am considering a purchase of a new laptop and have looked at Toshiba's web site. I have noticed with interest that it quotes recommended selling prices for its products. Inevitably

#### DVD loyalty

There are six regions for DVD-encoded discs. Each region can be of PAL, NTSC or SECAM format, and can be stored on 2.6Gb or 4.7Gb DVD-RW discs. Each region can also have the AC-3, DTS, SDDS or MPEG audio system. So, there are 144 possible DVD formats. MPEG 1 may be a bit blocky and VHS may use "old" analogue magnetic storage, but at least there's some confidence that films can be played back on the majority of machines. Some VHS recorders can even play back both PAL and NTSC formats.

These days, the main aims of computing are ease of use and compatibility. When Microsoft tries to make some parts of Java non-compatible, everyone is up in arms; yet when there are more ways of storing the next generation of video than there are American states, no-one bats an eyelid. Call me old-fashioned, but at least my videotapes work with most of the world's VCRs.

**Andrew Butler**  
[abutler@globalnet.co.uk](mailto:abutler@globalnet.co.uk)

*Gordon Laing replies: It's that old devil called DVD again. Certainly I share your frustration, and it looks like the situation could soon become even more complicated. In the US, a system called Divx is being suggested for rental of DVD titles. The title is rented for around five dollars and has a 48-hour lifespan from the moment you start playing it. If, after the expiry time, you wish to watch it again, your DVD player, cunningly connected to your phone line, makes a credit-card payment on your behalf; an additional charge could unlock it permanently.*

*So, no returns to Blockbuster, but you will now need a new Divx-compatible DVD player and the potential horror of wrong numbers and phone bills. In the UK, at the time of writing, there are no immediate plans to employ a Divx system, nor for that matter a DTS audio compatible player. One upside is that we've seen our first PAL Region 2 title, "Jerry McGuire", encoded with both MPEG and Dolby Digital (AC3) audio. There are even a couple of domestic PAL DVD players available, although so far they're ignoring the MPEG audio track. Good!*

*I have no doubt that DVD will be a big hit on PCs as the natural replacement for CD-ROM, but in the home I fear it may be a different matter. The early adopters have already opted for imported US or Japanese players and had them "chipped" to play both Region 2 and US Region 1 titles. This may be a bit under-the-counter, but seems the best bet until our shops are confidently stacked with decent Region 2 titles.*





There's nothing to stop you buying your Tosh abroad, but we can't vouch for the availability of parts



these are given in US dollars. So when I am expected to pay £1,500 here in the UK, I can expect to pay US\$1,500 according to their web site in the US. Is there a way of ordering this over the internet and what technical issues might there be?

**Martin Cleaver**  
[MClea86968@aol.com](mailto:MClea86968@aol.com)

*Adele Dyer replies: All Toshiba notebooks worldwide are sold through resellers, so theoretically you could order one from a reseller in the States. As to the technical issues, there do not appear to be too many problems. The power adapters sold with Toshiba notebooks are all auto-sensing global adapters which will work anywhere in the world. A world-wide warranty can also be supplied through Unisys. The only likely problem is in getting hold of parts should the machine break down. Some models sold in the US are not available in the UK, and so neither are the parts for them.*

**Don't do DVD down**  
 Writing in response to Tim Nott's article in April's issue, I'd just like to point out that DVD has not been the resounding failure the article implies. The people who are anti-DVD in the

States report that DVD has sold less than projected, but other sources state that it has been a massive success, completely outstripping the initial launches of video, CD and laserdisc.

Nor are DVD titles thin on the ground: you can get several hundred top-notch titles from the US and a fair few from Germany without any problem, if you are prepared to order from the internet. Sales of these titles are good, with Air Force One having sold 200,000 copies in its first month of release. Have a look at the DVD calendar [www.laserviews.com/dvd-calendar.html](http://www.laserviews.com/dvd-calendar.html) for example titles which are available or becoming available.

The only risk for DVD in Britain is how much the retailers over here decide to rip off the public. Laserdisc was a reasonable success in America, because pricing was similar to VHS, but over here it was grounded by ridiculously high prices. If this is not repeated for DVD, and British companies such as the BBC begin to release on it, I foresee a bright future for a format which deserves to supplant VHS entirely. Articles such as Mr Nott's slightly misinformed one

will not, however, help build public confidence and will allow less desirable formats such as DVHS to gain a foothold.

**Andrew Fish**  
[amfish@globalnet.co.uk](mailto:amfish@globalnet.co.uk)  
 •See "DVD loyalty", page 61

**Free email addresses**  
 I am a poor student and am trying to avoid the high charges of ISPs by subscribing to and switching between their free one-month trials. The only problem I have in doing this is that I have to constantly change my email address. Are there any companies out there offering free email addresses?

**Richard Vining**  
[vining@cs.bris.ac.uk](mailto:vining@cs.bris.ac.uk)

*Clive Akass replies: At least two free services are on offer. You can get free email at [www.hotmail.com](http://www.hotmail.com) and a free web connection plus email at [www.x-stream.com](http://www.x-stream.com). Apologies for last month's Newsprint, which printed this second address without the hyphen.*

**Transatlantic tracking**  
 I am working on the genealogy of several of my family lines. I have a copy of a program called Street Atlas USA from the American company, DeLorme, which has proved useful in mapping locations that are part of our family history here in the US. As I am now at the point where I would like to pinpoint the locations my family lines came from in Europe, I would very much like to be able to generate and print similar maps of the localities there that are now of interest.

Are there any companies that have developed a similar program for mapping to the street or country lane level in any or a number of the countries of Europe, including the UK? I have searched through a number of the publications and catalogues of

US software distributors and find only programs for mapping the US or North America.  
**Hubert Paulson**  
[hubertpaulson@juno.com](mailto:hubertpaulson@juno.com)

**The rules of the game**  
 Nice to see a healthy section devoted to retro computing in your 20th anniversary issue. I was particularly thrilled to see the page on classic games as I maintain a retro games site on [www.arrrgh.demon.co.uk](http://www.arrrgh.demon.co.uk). A lot of it looked rather familiar, though possibly because the Knight Lore, Jetpac and 3D Monster Maze graphics had been pilfered off my site (only I could take a screenshot of Jetpac that makes the game look so boring). So how about a belated mention in PCW?  
**Mat** [mat@arrrgh.demon.co.uk](mailto:mat@arrrgh.demon.co.uk)

*As you wish, Mat. Thanks for the pictures, and how about a toast to Ultimate Play The Game? From Jetpac through to the Sabre Wulf Trilogy, I don't think anyone anticipated a Spectrum could be that much fun.*

**Tried and tested**  
 In Hands On Hardware, May 1998, Roger Gann said: "Windows 95 OSR2 can be used as an upgrade. Just rename all instances of win.com on your hard disk. OSR2 then goes ahead and acts just like the original Windows 95 upgrade CD and even keeps your settings (registry as well!)." I have done just this, followed by a few minutes converting most of my FAT16 partitions to FAT32 using Partition Magic. It worked fine, and I've since done the same to over ten others.  
**Jason Ozin**  
[helpme@cheerful.com](mailto:helpme@cheerful.com)

**Key points about Newton**  
 Congratulations on your 20th anniversary. I have been reading PCW for most of those 20 years and enjoyed the trip down

memory lane. How things have changed! I have most recently (well, for the past four years) been a Newton aficionado and welcomed the review of the MP2100 in the group of PDAs tested. I was however very surprised by Ian Betteridge's comments on poor handwriting recognition. Nearly all other reviews I have read give high marks to the NOS 2.x and especially the MP2000/2100 with the faster processor. I use an MP2000 all day long taking notes in many meetings and have very high accuracy. It's not 100 percent, but well over 95 percent, I would guess.

Also, why do you criticise the fact that the keyboard is optional? Surely that is the best way for the consumer who may not want it. I got the keyboard, but have used it about three times in the past six months.

How tragic that Apple decided to drop the Newton just when it was gaining recognition as a serious alternative for a laptop (which you quite rightly point out in your review). Have a prosperous next 20 years.

**Bob McDermott**  
[100116.1470@compuserve.com](mailto:100116.1470@compuserve.com)

*Ian Betteridge replies: I too use a MessagePad all day long, and as you say, the handwriting recognition does reach around 95 percent accuracy after a*

*while. For the new user, however, it can be frustrating, particularly if you have cursive handwriting.*

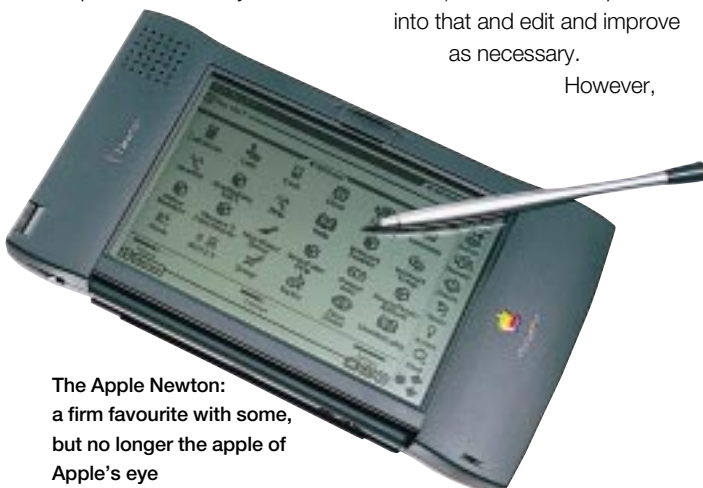
*The fact that the keyboard is optional is not too bad — except when you consider that the MP2100's list price is nearly £750, and that the keyboard costs a whopping £75 on top of this. Including the keyboard would be a nice touch, particularly as it is required in order to use the word processor.*

**Visual in my sights**

We are a medium-sized engineering company in a specialised process contracting industry and we probably suffered by getting into using computers earlier than we should. So, as time has gone on, we have had to transfer lots of old data we had into different software. I think we are probably the world's experts in converting DOS Supercalc into Excel! Not to mention DOS DataEase into Access.

What we are left with now is a dozen or so programs written by us mostly in GWBasic, but later converted to QuickBasic and compiled. I need to convert these into a Windows base format to make them more user friendly and generally available on our network, and I have assumed that the way to do this would be to purchase (and learn!) Visual Basic, import them into that and edit and improve as necessary.

However,



**The Apple Newton:**  
 a firm favourite with some,  
 but no longer the apple of  
 Apple's eye

everything I have ever read about Visual Basic concentrates on its use as a database creator or manipulator, and although this would be useful to us, it wouldn't be the primary purpose.

Would this be the right route for us or can you suggest alternatives?

**Joe Smith**  
[post@dewplan.co.uk](mailto:post@dewplan.co.uk)

*Tim Anderson replies: Visual Basic is fine as a general-purpose language. Its database functions get a lot of attention simply because the majority of business applications are linked to databases. If you want to migrate code easily from QuickBasic, VB is the obvious choice. The Professional version will be all you need, since most of the extras in the high-end Enterprise version are for client-server database work. Of course, there are alternatives — check the group test in April's PCW. If you are running an intranet, you might consider how to make the applications easily accessible from a web browser.*

**VET's in practice**

We were extremely disappointed and surprised by your recent review of VET 9.6 for Windows 95 (PCW, April 1998). It is inaccurate, and makes ludicrous claims about the internal workings of our product. Your reviewer, Julian Moss, asserts: "VET failed to detect one sample of the easy-to-spot Maltese Amoeba and all but a handful of the more difficult Natas virus", suggesting "the software uses inadequate pattern matching detection methods".

Could I be so bold as to suggest it is more likely Mr Moss is using inadequate virus samples and making flawed assumptions based on inadequate research. VET uses advanced heuristic and decryption techniques to find

polymorphic viruses, and it does so without generating false positives or triggering on corrupted files.

Our own testing indicates we have excellent polymorphic virus detection capabilities, but more to the point, so does the testing of independent review bodies reported in recent Virus Bulletin reviews. This includes a 100% detection rate in a recent NT Comparative review. These tests include only three samples of Maltese Amoeba, but 500 samples (randomly generated for each test) of Natas. In all tests, VET detected all these samples.

Secondly, our on-access scanner configuration most certainly does allow cleaning without intervention, and this is the default setting for a typical installation of VET. Happily, we also detect infections on network drives too.

Thirdly, our product does indeed come with mailed quarterly updates in addition to online updates at a cost of £59 (not £79) in Year 1 and £29.50 for each subsequent year.

Finally, version 9.6 was not on release anywhere when it was sent to Mr Moss. It was subsequently released both in Australia and the UK.

**Jill Memmott, director, VET**  
[info@vetavs.co.uk](mailto:info@vetavs.co.uk)

**Social skills**

I have a Gateway 2000 P5-166 with an Eagle-Eye motherboard. When I rang Gateway to check whether I needed EDO or SDRAM DIMM to upgrade, I was told that I should buy my SDRAM there as the motherboard requires special kinds to run efficiently. I understood the standard to mean one SDRAM DIMM was equivalent to another. Will buying Gateway's "social" DIMM have any effect on performance? It costs nearly twice as much as I can get it elsewhere!

**Geoff Schrecker**

*First of all, it's not worth mixing EDO and the faster but more expensive SDRAM, since most systems will operate at the slowest common denominator. As to the supplier of the memory itself, we understand that you should be able to fit anyone's so long as it meets the required specifications. In the case of SDRAM DIMMS, you'll have to make sure they're the correct voltage and rated at the desired speed.*

*We recommend going for SDRAM rated at 100MHz, since it will work on the latest PII BX chipset motherboards if you want to upgrade in the future and should survive over-clocking on older systems. We are currently conducting tests on different types of memory and optimised motherboard settings for a forthcoming feature. We would welcome readers' experiences.*

**The wizard of OS**

Can anyone explain why it seems to be so hard to buy a new PC without having to buy yet another copy of a Microsoft operating system?

I recently asked a dozen suppliers for quotations for a new system unit; only one followed my instructions to omit an operating system. I already have licences for Windows 95 and Windows NT 4.0 Workstation. I only want to install NT on the new system and remove it from my old one, so why should I have to buy another copy of Windows 95?

If manufacturers and systems integrators are being pressured by Microsoft into not supplying systems without a copy of Windows, this is serious malpractice, even more serious than the unnecessary bundling together of Windows 95 and Internet Explorer. The point is that one might very well not want to run a Microsoft operating system at all; some

users actually prefer Linux, FreeBSD or even OS/2 Warp.

And while I'm griping about the way in which systems are bundled, why oh why do most systems these days seem to contain bits which I don't need, or at least don't want to replace, like modems and speakers, not to mention bundles of software which are of no value to me.

Finally, what is the justification for the current trend towards ever-larger monitors? A 17in monitor just won't fit on my desk. Even with a 15in, I feel I'm uncomfortably close to the screen. What I feel I need, in the absence of reasonably-priced TFT displays, is a monitor with a small screen (about 12in) but with a high refresh rate and about half the dot size of current displays. This would be comfortable at 1,024 x 768 at a working distance of 0.5m by people with normal vision.

**Brian Beesley**  
[bjb@bbhvig.u-net.com](mailto:bjb@bbhvig.u-net.com)

*Gordon Laing replies: You sound like the kind of person who really ought to be building his own custom PCs from scratch, just using the components you require. Many of us here at PCW have built our own systems, and have found it a rewarding and surprisingly pain-free experience.*

*However, you will find that the cost of buying separate components often works out more expensive than buying a complete system, even if it comes bundled with software and hardware you don't really require. Most manufacturers are fitting OEM components and software which costs them much less than they would an end-user buying one-offs.*

*I prefer larger monitors, and work with a 21in in the office and a 17in at home. They may occupy the best part of my desk, but I do prefer their larger image area.*



# Gadgets

Compiled by Adam Evans. Photography by David Whyte.

## A digital desirable to make video easy

The GR-DVL9000 digital video camera is the latest hot product from JVC. It features an F1.2 lens, 4in colour LCD monitor, colour viewfinder and 100x digital zoom facility. The horizontal resolution is 500 lines and the vertical resolution is 560 lines which, coupled with progressive scan CCD and a new luminance processor, means the ability to produce very high-quality still pictures as well as video. You can connect the camera to a PC via a serial port or IEEE 1394 (also known as DV Out). Video and image-editing software for the PC is included in the box.

**Price** £1,799 (£1,531.07 ex VAT)

**Contact** JVC 0181 208 7654 [www.jvc.co.uk](http://www.jvc.co.uk)



## Radio control combo

We've seen cordless mice and keyboards before, but the Cordless Desktop from Logitech breaks new ground. Incorporating both keyboard and mouse, the package operates using advanced radio technology. Unlike infra-red, radio devices do not need to be pointed at the receiver, which can be stored in a drawer or in another out-of-the-way location. The mouse is the three-button Cordless MouseMan Pro and the keyboard has a detachable wrist rest. Both are seriously stylish items and use just one radio receiver, which can detect signals from up to six feet away.

**Price** £99.99 (£85.10 ex VAT)

**Contact** Logitech 0181 308 6582 [www.logitech.com](http://www.logitech.com)



## Videoconferencing for all

Take a look at the latest desktop video camera from Creative Labs. The Video Blaster WebCam II is a full-colour camera which weighs in at under £80, making it light on the wallet for anyone with an interest in transmitting video over the internet. It can capture live video at up to 30 frames per second, at resolutions of 176 x 144, 160 x 120 and 128 x 95. Still images can be taken at even higher resolutions. No capture card is required: you simply connect it to the parallel port, install the software and you're away.

**Price** £79.99 (£68.08 ex VAT)

**Contact** Creative Labs 01245 265265 [www.creativelabs.com](http://www.creativelabs.com)



## Absolutely fabulous

Splashed out on a pair of expensive speakers for your PC but got nowhere to put them? Why not treat yourself to the Designer Speaker Bracket: "An attractively moulded plastic piece of kit, designed for optimum listening pleasure". Speakers weighing up to 5kg can be rotated 360° on one axis and can tilt 15° on the other, for tremendous flexibility. Cable management and strain relief (we like the sound of that) are built in, too. The standard product comes in grey or black but other colours can be specially ordered. Designer Speaker Brackets are available from MBC Innovations and on the high street through Dixons and Currys.

**Price** £14.99

**Contact** MBC Innovations 0181 351 6456 (no web site)

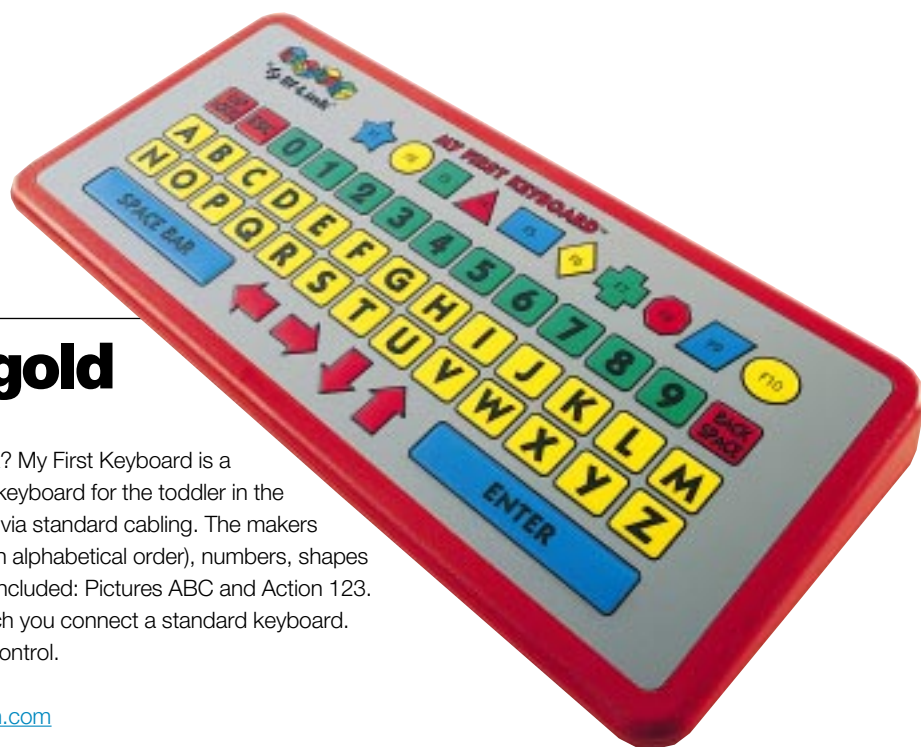


## Smile — you're on Game Boy

Can you believe this? A digital camera for the Nintendo Game Boy! To be launched sometime in the summer, the Game Boy Camera can store up to 30 low-resolution black-and-white images. The madness does not stop there, either: pictures can be doctored using clipart and a paint program, and you can even use images (like your little sister's head) in a Space Invaders-style game. Pricing has yet to be finalised but it will sell in the US for \$49.95, so a £49.95 price tag is more than likely.

**Price** To be announced

**Contact** Nintendo 01703 653377 [www.nintendo.com](http://www.nintendo.com)



## Toddlers strike gold

Who says small children and computers don't mix? My First Keyboard is a robust, splash-proof, brightly-coloured computer keyboard for the toddler in the family. It is fully functional and connects to the PC via standard cabling. The makers claim it offers four-part learning, including letters (in alphabetical order), numbers, shapes and colours. Two lots of pre-school software are included: Pictures ABC and Action 123. Adults are catered for with an extra socket to which you connect a standard keyboard. A flick of the switch is then all it takes to assume control.

**Price** £57.58 (£49 ex VAT)

**Contact** Centreprise 01256 378004 [www.kidtech.com](http://www.kidtech.com)

# First Impressions

Take a first look at the SmartSuite Millennium beta on **p86** and at the beta version of Photoshop 5, too (**p88**). You can get organised with the Palm III on **p75** or Outlook 98 on **p90**. And why not put some serious 3D magic into your game with Voodoo2 (**p85**)?

## ■ Software

## Big Red Galileo Internet

It may not be a star turn but it's internet ready; fine if you want a secondary PC for the family.

**B**ig Red is a relative newcomer to the PC market, having set up in early 1995. It is a small organisation but it supplies to both high and low ends of the corporate market, as well as producing consumer-friendly models for home-users. The company is obviously keen to stake its claim in the sub-\$1,000 market which, last year, was the fastest-growing PC market sector in the US.

It is an increasingly popular price option with home users in Europe, too; buying stripped-down machines for exploring the internet or doing homework, or purchased as a second PC. The growth of this previously overlooked market in the US and Europe partly accounts for Intel's recent embrace of the cost-conscious "Basic PC" consumer and the company's announcement of the forthcoming cheap alternative to the PII, the Celeron CPU (see *feature*, page 212). The economy of the Galileo Internet's price is reflected in the size of the AT mini-tower housing, and the PC takes up minimum desktop space.

For its price, the technical specifications of this PC are unsurprisingly modest: the Galileo has

a mere 16Mb of EDO RAM, a 2.1Gb hard drive and a 16-speed CD-ROM drive, although it is fitted with the speedy Cyrix 200MX. The processor runs at 166MHz although it has a Pentium Rating of 200MHz. With the motherboard and VX-clone chipset, both manufactured by Protac, Big Red has opted for a completely Intel-free machine.

If you are thinking of buying a secondary PC that may be used for games, the performance of this machine will disappoint: 3D processing can only be a fond dream with the S3 64V graphics card with 2Mb. It scored poorly when we ran the Quake frame-rate test. Also bear in mind that the S3 card is not compatible with Microsoft's set of gaming protocols for Windows 95, Direct3D. In fairness to such a budget PC however, Big Red is probably not targeting users who want to play the new generation of 3D games with this machine.

As befits its name, the Galileo Internet is internet-ready, and its 33.6Kbps Diamond Supra voice/fax modem was quickly online. The machine arrived with Internet Explorer 4 pre-installed, and there was the usual bundle

of introductory ISP offers.

The Supra modem takes up one of three ISA slots, while another is filled with Yamaha's 16-bit OPL3-SAX sound card. The third is free. The S3 graphics card fills one of the four PCI slots, leaving the other three free.

Although this PC has only 16Mb of EDO RAM, the VX chipset also supports SDRAM. And as well as the four SIMM slots, there are two DIMM slots if you wish to upgrade. The neatness of the Galileo's innards leaves something to be desired too, and access to the RAM is problematic.

It would be a mistake to criticise the Galileo Internet for its skimpy specifications, because on the evidence of last year's PC industry sales figures there is a growing demand for this type of pared-down machine. It will suit certain customers, but a PC like this isn't for performance-junkies or new-technology fiends. We were disappointed by the low BAPCo test score of 115, although you should be okay with gaming software from two or three years ago. And if you simply want to run office applications



**Contents**

**First Impressions**

- 72 Big Red Galileo Internet
- 74 Siemens Nixdorf Scenic 320CX
- 74 *All about ADS screen technology*
- 75 Sony Multiscan 400PST
- 75 3Com Palm III
- 78 Rolodex REX
- 78 Sharp HC-4100A
- 80 QMS magicolor 2 DeskLaser and CX MultiPACS
- 83 HP OfficeJet 635C and HP LaserJet 3100
- 85 Creative Labs 3D Blaster Voodoo2
- 85 Appian Graphics Jeronimo J3
- 86 Lotus SmartSuite Millennium (beta)
- 88 Adobe Photoshop 5 (beta)
- 90 Microsoft Outlook 98 (beta)
- 93 Illuminatus 4
- 95 Autonomy Agentware Suite 2.1
- 96 Caere OmniForm v3.0
- 99 AND Route 98 UK and Ireland & Europe
- 100 IMSI Family Heritage v2
- 102 Net.Medic Pro
- 102 ErgoSentry

**CD-ROMs**

- 103 IBM World Encyclopaedia
- Kids**
- 104 Disney Alladin Maths
  - 104 Microsoft My Personal Tutor

**Long Term Tests**

- 106 Fast Forms 2.0
- 110 Adobe Photshop 4.0
- 111 Epson EPL-5500
- 111 Logitech MouseMan Sensa

**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

like spreadsheets and word processing, you shouldn't have much trouble at all.

The Galileo Internet arrived with a raft of Eupress software that Big Red claims is worth £380; titles covering everything from learning French to managing your home finances. Norton Utilities and Crashguard are pre-installed. However, the generosity of the software should be weighed against the fact that the Galileo doesn't have speakers. Not a major flaw, of course, but if you are thinking of buying a basic PC like this for your children, you might bear in mind that there is no way for them to listen to

their games and CD-ROMs other than with headphones (which may be a blessing in disguise).

Big Red is particularly proud of its post-sales service and support, claiming that 65 percent of its custom comes via word-of-mouth recommendation. The Galileo has a generous five-year warranty, with the first year on-site including parts and labour. The remaining four years are Return to Base (RTB), labour-only.

The Galileo's is a cheap-and-cheerful PC that is good value for money, although we were nonetheless underwhelmed by the hardware on

display inside. In the May '98 issue of *PCW* we reviewed a machine for £500 (ex VAT; the Linear Excel) which had more RAM and bigger hard drives.

Admittedly it had no modem, whereas the Galileo is internet-ready. The Galileo would be perfect as a second PC perhaps, but if it is to be your only PC, think carefully beforehand about what you will be using it for.

Paul Trueman



**PCW Details**

**Price** £703.83 (£599 ex VAT)

**Contact** Big Red 0181 245 2456 [www.bigred.co.uk](http://www.bigred.co.uk)

**System Reviewed** Cyrix 200MX, 16Mb EDO RAM, 2.1Gb, 14in monitor.

**Good Points** Cheap. Lots of software. Internet-ready.

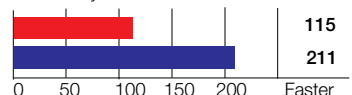
**Bad Points** Disappointing performance. Only 16Mb RAM.

**Conclusion** This may suit you if you have limited ambitions for your PC.

★★★★★

**Performance results**

BAPCo Sysmark Windows 95 test scores



Legend: Big Red Galileo Internet (Red bar), Watford Aries MM Pro (Blue bar)

## ■ Hardware

# Siemens Nixdorf Scenic 320CX

New notebook on the scene, sporting the latest ADS technology.



**W**ith the launch of the Scenic Mobile 320, Siemens is broadening its notebook range to encompass entry-level machines. Prices (ex VAT) for the three configurations of Mobile 320 begin at £1,249 and the machine reviewed here can be bought for £1,797. Our model had a P166MMX, 16Mb of RAM, 2Mb Chips&Tech graphics card and a 20x CD drive. It isn't exactly a jaw-dropping specification, but that's just the point: with the 320, Siemens hopes to target the business user who needs the functionality of a mobile PC but without the extra cost of unnecessary RAM and processing power.

From the reassuring solidity of the notebook's build, to the rather lovely shallow, yielding keyboard, this notebook doesn't so much scream quality as sidle up next to you and quietly impress you with its charms.

The 320CX has Siemens' distinctive light-green colour scheme, against which the white and grey keyboard stands out rather well. There is an easily-located power button in the centre of the keyboard above the keys, and the glidepad is responsive without being too sensitive. The 12.1in screen utilises the new passive display technology, ADS, or Advanced Display System

(see below for more details).

While not in the same league as a TFT display, ADS is a definite improvement on the bad-old days of bleeding DSTN (Double Twisted Super Nematic) screens, and the cursor is more visible thanks to the reduction in "submarining". There is occasional ghosting, but the improved response time of the ADS display allows you to view video clips to good effect.

Although it is possible to hook the 320 up to a monitor, there is no TV Out port. The Li-Ion battery should be good for 2.5 hours and there is room for two Type II PC Cards, or one Type III. An upgrade option is to kit out the notebook with an internal 100Mb Iomega Zip drive, which is an unusual touch for an entry-level machine.

Siemens' pricing system makes the 320CX look rather uncompetitive when compared with stock from direct-sell companies like Dell, although it will no doubt appeal to buyers in large companies who have adopted the rest of the Siemens range and do not mind paying premium prices to a company with a reputation for quality products.

Paul Trueman

## PCW Details

**Price** £2,111.48 (£1,797 ex VAT)

**Contact** Siemens Nixdorf 0800 125555  
[www.sni-epc.co.uk](http://www.sni-epc.co.uk)

**System Reviewed** P166MMX, 16Mb RAM, 2.1Gb HD, 12.1in ADS screen.

**Good Points** Strong brand support for a quality item.

**Bad Points** More expensive than Siemens' rivals.

**Conclusion** A quality piece of kit that is reassuringly expensive.

★★★★★

## The new Advanced Display System screen technology

**T**here are two basic types of screen for a notebook: active matrix, a.k.a. TFT (Thin Film Transfer), and passive matrix or STN (Super Twisted Nematic). The new ADS (Advanced Display System) that Siemens are introducing is an improved variation on passive matrix technology. To understand the improvement you first need to know how active and passive matrix technologies work.

### ■ Active matrix display

Each pixel is formed by three individual colour transistors (red, green, blue) that are either on or off. The computer selects which transistors to light, actively driving the display. Crystals in active matrix displays revert to their inactive state only when an instruction to do so is issued by the graphics chip.

### ■ Passive matrix display

The liquid crystals in the LCD are enclosed between two plates of glass: one lined with vertical parallel wires or tracks, the other with tracks running at right-angles to those facing. An electrical field is created between the tracks and this operates on the crystal causing it to twist, and let light through the pixel. The crystal receives the brief voltage pulse before the process is sequentially repeated, very quickly, on neighbouring crystals to form the designated image. As each pixel is controlled only by an electrical field, rather than by a specific transistor as in active matrix displays, "bleeding" is often a problem as the electrical field can partially turn on neighbouring crystals, creating a shadowing effect. Also, the electrical current is normally weaker at the ends of the tracks than at the beginning, so pixels here are often less

easy to control and more likely to be affected by bleeding and shadowing. In passive matrix displays, as soon as the voltage dies away the crystals begin to revert to their former state. Because some pixels are dimming as others are being refreshed you don't see a uniformly bright picture while viewing the image. This is exacerbated by the relatively slow refresh rate of an LCD screen compared to that of a CRT monitor. As refresh rates and electrical currents are low and the viscosity of the liquid held between the two plates also affects the response times of the display, passive matrix screens are slow to react, so being unsuitable for showing video or fast moving graphics.

### ■ How ADS improves things

Siemens claims that ADS technology has improved upon the above scenario in a number of ways. The distance between the two plates has been reduced to six billionths of a millimetre, which increases the strength of the field without having to boost the voltage.

More precise colour filters are now used for the three primary colours and ADS has a new driver to refresh the signal more efficiently, so reducing shadowing. Finally, thinner, less viscous crystal fluid has been used which halves the response time of the crystals. However, one disadvantage of the crystals' increased response time is that they also now revert to their passive state more quickly. To counter this, the image refresh rate has been doubled and a microchip and RAM has been added to the panel to help process the image more efficiently by addressing several lines at a time.

Paul Trueman

## Hardware

Personal  
Computer  
World  
Recommended

# Sony Multiscan 400PST

Clearly excellent. Nineteen inches of Trinitron tube can be yours for a competitive price.

Until now, most 19in monitor tubes have been made by Hitachi and all have used aperture grille technology. The Multiscan 400PST from Sony is the first 19in Trinitron tube we have seen and one of the best implementations of the technology, with the two parallel wires that hold the grille in place hardly visible at all. Its 18in viewable diagonal provided plenty of room for graphical environments, and its BNC and D-SUB connections meant we could connect two computers and switch between them via a button on the fascia.

Once the supplied Windows drivers had been installed, the monitor was ready to use without further adjustments. There was no visible evidence of pincushion or geometric distortion. While maintaining a black background, and using DisplayMate as our benchmark, it was possible to make a clear visual differentiation between 24 out of a possible 25 shades of the ten principal colours on the screen, all of which faded at a uniform rate. On single-colour grey screens there was minimal lightening on the left half-centimetre of the image and, when set to black, room



reflection was minimal. Difference in the relative densities of small images of differing brightness was difficult to detect. White "o" characters had the same thickness and internal diameter in three shades, ranging from high white to dark grey, although high white horizontal bars did have a slightly greater width than their dark

grey counterparts. There was only minimal degradation at the edges of the screen. We found no evidence of convergence or mis-registration on either horizontal or vertical test patterns. Similarly, fine line, dot, sparse dot and sparse slot test patterns failed to induce moiré.

The OSD was comprehensive and easy to use, including a zoom function that adjusted horizontal and vertical screen sizes simultaneously. Direct access to contrast and brightness was provided by fascia-mounted buttons, and maximum non-interlaced refresh rate was 75Hz at 1,600 x 1,200 resolution.

Nik Rawlinson

### PCW Details

**Price** £821.33 (£699 ex VAT)

**Contact** Sony 0990 424424 [www.sony-cp.com](http://www.sony-cp.com)

**Good Points** Good regulation, and no problems in many testing areas. Competitively priced.

**Bad Points** Very slight luminance inconsistency.

**Conclusion** A good-looking monitor that performed well.

★★★★★

# 3Com Palm III

"Beam me your business card, Scotty. I'm holding my new, improved, infra-red linked organiser."

Physically, the Palm III looks much like its predecessor, the Palm Pilot Professional. Note how subtly the word "pilot" has been dropped from the name now that 3Com owns the product!

The Palm III remains a handheld organiser, with diary, address book, to-do list, memo pad etc. that eschews a QWERTY keyboard in favour of a stylus, a touch-sensitive screen and Graffiti character recognition software.

The main visual identifiers of the new version are a screen cover in the form of a slightly tacky snap-on plastic flap, and a re-designed stylus which is now sleeker, heavier and more elegant.

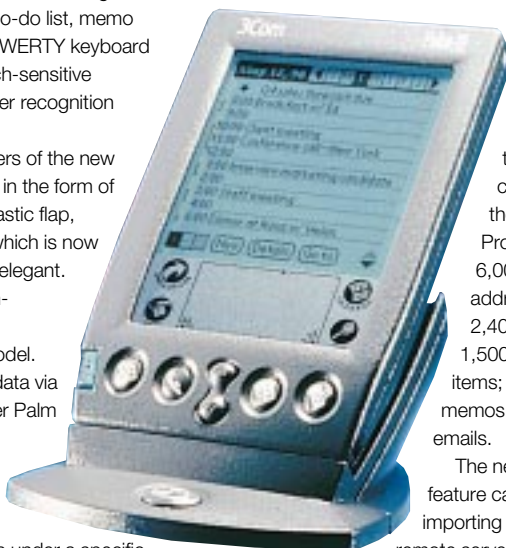
Nor are there any earth-shattering changes in the functionality of this new model. True, you can now beam data via an infra-red (IR) link to other Palm IIIs. Single entries in the Address Book, Memo Pad or whatever can be transferred in this way, or you can send all the entries under a specific

category: for instance, all the memos in the business category.

A neat feature is the ability to beam your business card, a pre-determined Address Book entry: swapping cards with other Palm III owners takes two seconds each way.

Other improvements include greater storage. In rough terms, the figures compared to the PalmPilot Professional are: 6,000 vs 4,000 addresses; 3,000 vs 2,400 appointments; 1,500 vs 750 to-do items; 1,500 vs 750 memos and 200 vs 100 emails.

The new file-linking feature can automate the importing of data from a remote server into the



Address Book or Memo Pad. Whenever the Palm III is synchronised with the desktop, you can import a file containing, say, the latest sales figures.

The Palm (Pilot) is an excellent machine, particularly for those who can't type/won't type. The major innovation in the Palm III is the infra-red link for beaming data to other Palm III users. This has potential, but is unlikely to tempt existing PalmPilot Professional users, apart from fanatics, to upgrade.

Mark Whitehorn

### PCW Details

**Price** £299.00 (£254.47 ex VAT)

**Contact** 3Com 0800 2225252 [www.3com.com](http://www.3com.com)

**Good Points** The Palm Pilot family are all excellent machines.

**Bad Points** The latest version is not a major rewrite, more of a point release.

**Conclusion** Buy it, but not if you already have an earlier version.

★★★★★



## Hardware

# Rolodex REX

Forget your pocket, what about your wallet? Rex is a right-on PDA small enough to fit the bill.

The idea behind the REX is simple: a personal organiser in the form of a Type II PC Card with a screen and five buttons for navigation.

It is so small, you can slip it into your wallet. But it has no keyboard and you cannot enter data onto the card itself. So, it comes with PIM software — TrueSync, which is a cut-down version of Starfish SideKick. This lets you transfer your contact, appointments, to-dos and memos to the card. You can import databases into TrueSync (from Symantec ACT! 3.0.6, Outlook 97, Microsoft Schedule + 7.0 and Lotus Organizer 97). Or, if you have SideKick 95 or 97, or Internet SideKick, you can open your existing files in TrueSync. If you have installed SideKick 98 as your primary organiser, it will automatically install the REX option.

Your data can be protected by passwords

which can be set both on the card itself and on the TrueSync software.



Connecting the card to your PC is easy. On a notebook you just whack the card into a PC Card slot and away you go.

Alternatively, there is a docking station available, as an extra, which connects to the serial port of your PC. Even though the connection is over the serial port, it is still rapid: we synchronised a contacts file with 671 records in around 40 seconds. You can load up to four contact books and one calendar at a time, depending on their size. We were able to transfer our 671 records, but REX ran out of room when asked to hold a database of 2,000-odd records.

There are four main areas to the software: calendar, memos, contacts and a world clock. The last has over 500 pre-set cities and can be used in conjunction with the calendar file to set your appointments when travelling to other time zones. The calendar has to-dos, calls and appointments sections which are easy to create and move, and there is the option of an alarm. Memos are equally easy to create and can be arranged in folders and files for easy access on the card.

Adele Dyer

### PCW Details

**Price** £129.99 (£110.63 ex VAT); with docking station £169.99 (£144.67 ex VAT)

**Contact** Franklin 01932 891025  
[www.franklin.com/rex](http://www.franklin.com/rex)

**Good Points** Small enough to fit in your wallet.

**Bad Points** No method of input. Cannot upload data from the card to your PC.

**Conclusion** If you don't need a keyboard, this is the ideal PDA.

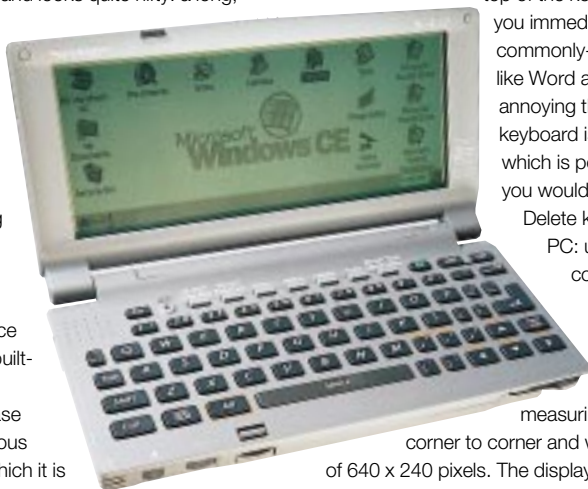
★★★★★

# Sharp HC-4100A

This CE handheld contender has a speedy software modem built-in, and a spacious keyboard.

This 8Mb RAM palmtop from Sharp is another addition to the slowly-growing stable of CE 2.0 machines in the UK.

It weighs 410g and looks quite nifty: a long, sleek design with a nice two-tone cover. There are three buttons on the side of the case for turning off the alarm, opening the machine and recording a voice memo via the built-in microphone. Opening the case reveals a spacious keyboard on which it is possible to type at a reasonable speed. As with all machines of this size, it is too cramped for touch-typing, but it is one of the better keyboards we have seen. The keys themselves feel a little lightweight and



plasticky, but the amount of pressure required to register a keystroke has been judged to perfection. There are seven shortcut keys at the top of the keyboard to take you immediately to the most commonly-used applications like Word and Excel. The only annoying thing about the keyboard is the On key, which is positioned where you would expect to find the

Delete key on a desktop PC: unless you are concentrating, it's all too easy to hit the wrong one.

The screen is a good size, measuring 6.5in from corner to corner and with a resolution of 640 x 240 pixels. The display has 16 levels of greyscale which contributes to a clear, well-defined image, although as with all touch-sensitive screens the Sharp is prone to a fair amount of reflected glare.

One of the HC-4100A's big selling points may

be the built-in software modem, rated at 33.6Kbps (much faster than the 19.2Kbps offered by the Philips Velo, the only other CE machine with a software modem).

The Sharp comes with batteries and a serial cable for connection to a PC. An AC adapter, docking cradle and rechargeable battery pack are available separately. Battery life is rated at 24 hours' continuous use without the backlight. The usual CE 2.0 applications are included, along with image editor and voice recorder applications.

Adam Evans

### PCW Details

**Price** £529 (£450.22 ex VAT)

**Contact** Sharp Electronics 0800 262958  
[www.sharp-usa.com](http://www.sharp-usa.com)

**Good Points** Slightly larger keyboard makes typing easier. Fast software modem.

**Bad Points** No AC adapter. Some mysterious battery-power warnings (which stopped after a while).

**Conclusion** A quality contender in the world of CE handhelds.

★★★★★

## ■ Hardware

# QMS magicolor 2 DeskLaser & CX MultiPACS

Two laser printers — a good one for business graphics and another for photographic output.

**F**ew managers can condone an expenditure of several thousand pounds on a colour printer unless there is a real need to print a large number of good-quality colour graphics on a regular basis. However, this rather perpetuates a chicken-and-egg situation: if you need high-quality graphics, you need a PostScript RIP in the printer, complete with a processor and plenty of RAM to rasterise the image and recreate it perfectly, and usually a hard disk to store images. But these components push up the price of the printer and keep it high.

During the past 18 months, the cost of colour lasers has dropped by about a third, although they are still typically around £3,000 to £4,000. The alternatives to a colour laser all have their advantages and disadvantages. Dye sublimation printers are almost as expensive as colour lasers, although they are better for photographic images. Inkjet printers are cheap, but the consumables make the cost of ownership high and they are too slow to be a viable option as a network printer.

However, if you need the speed and convenience of a network laser printer, but could also benefit from the odd use of a few colour graphics and spot colour for logos etc., there is now a solution.

QMS has come up with a WPS (Windows Printing System) colour laser printer. As most colour laser printer owners only use their printers

high as you would expect from a PostScript or PDL (page description language) printer and the processing is handed back to a PC, rather than being handled by the printer itself. To determine the pros and cons of each system, we lined up QMS' WPS printer, the magicolor 2 DeskLaser, against its top-of-the-range PostScript RIP colour laser, the magicolor 2 CX.

The magicolor 2 DeskLaser has the same Hitachi print engine as the 2 CX and looks identical. It is essentially the same printer, in all but printer driver, although it has less RAM: just 8Mb expandable to 32Mb with standard SIMMs, compared to 24Mb as standard on the CX, expandable to 80Mb. This gives the DeskLaser a top resolution of 600 x 600dpi and the CX a top resolution of 1,200 x 1,200dpi with all the memory installed.

The CX uses a 133MHz NEC VR4300 64-bit RISC processor. As the printers have the same engine, they are both able to churn out the pages at the same rate of 16ppm in monochrome, although in colour the CX is able to do 4-8ppm and the DeskLaser just 4ppm (these rates are raw engine speeds and do not include processing time).

The consumables are the same for both printers. The four toner cartridges (CMYK) are slid into the printer by opening a door on the front. Each black cartridge should last around 10,000 pages at five percent coverage and the colour cartridges around 6,000 pages at the same rate.

Both printers have ethernet connections and can be run over the network, using TCP/IP. This also makes it possible to audit the printer, monitoring such things as the level of your paper and toner cartridges, as well as giving breakdowns of who is using the printer and how much it costs per sheet. This way you can share the printer among more than one department and bill each department accordingly. It also keeps tabs on individual users so your staff will not be

tempted to print out their own 200 sheets of

full colour after everyone else has gone home!

On the quality tests the CX came out above the DeskLaser, as we had expected. It had excellent output for all types of printing, whether text,

monochrome images, business graphics or photographs. In fact, we were

very pleased with the photographic output, which is something that colour lasers are not known for doing particularly well. With the scanner connected directly to the printer, copying directly from one to the other, the output was not as good and scanned colour images came out distinctly banded and faded. However, if you do not have the original file, you could make do with this passable copy.

The DeskLaser was not so hot on photographs. These came out a little dull and with some banding of the image, but no worse than the output from some inkjet printers. Nevertheless, it shone on business graphics, outperforming other colour lasers more than twice its price.

Adele Dyer



(Top) magicolor 2 DeskLaser  
(Above) magicolor 2 CX MultiPACS

for letterheads and logos, it makes sense to get rid of the overhead of the PostScript RIP and use a simpler, more economical system. There are pay-offs of course, notably that the quality is not as

### PCW Details

#### magicolor 2 DeskLaser

**Price** £2,109.13 (£1,795 ex VAT)

**Contact** QMS 01784 442255 [www.qms.com](http://www.qms.com)

**Good Points** Good colour business graphics.

**Bad Points** Not so hot on photographs.

**Conclusion** Affordable and adaptable network laser printer.

★★★★★

#### magicolor 2 CX MultiPACS

**Price** Magicolor 2 CX with 24Mb of RAM £3,284.13 (£2,795 ex VAT); Scanner £1,991.63 (£1,695 ex VAT)

**Contact** (as above)

**Good Points** Good photographic output.

**Bad Points** Direct scanner-to-printer copying was a little disappointing.

**Conclusion** A good all-round colour laser.

★★★★★

## Hardware

# HP OfficeJet 635C & LaserJet 3100

A small, quick, easy-to-use printer and its high-quality big brother for fast faxing and scanning.

The sticker on the OfficeJet 635C proclaimed that this machine would make it "easy to do your work", and it wasn't lying. Essentially a printer with built-in fax machine, it is also capable of scanning and copying your work quickly, easily and in colour.

The black and colour (CMY) cartridges put colour copying within your reach at a fraction of the price of a colour copier. Bear in mind, though, that it uses inkjet technology with a maximum resolution of 600 x 600dpi so the pay-off is slightly lower quality: some large blocks of solid colour looked speckled and waxy. Size alterations between 50 percent and 200 percent supplemented the facility to make up to 99 copies unattended.

We have come to expect great things from Hewlett-Packard's (HP) inkjets but were slightly disappointed with the general print quality of the 635C. At "best" and "normal" quality the text had smooth edges, but it looked a little too heavy while in "economode", where small characters were slightly feathered. It was fast, churning out five normal-quality pages from

Word in just 2min 42sec. A

high-quality page of

business graphics from

CorelDraw was lined

and it failed

to print



a reverse

hairline, although

there was no evidence of

stepping on a graduated colour fade.

A high-quality A4 photo on glossy paper was dark and grainy, with little definition of shaded and highlighted areas on a red surface.

Meanwhile, HP's new "All-in-One" launch, the LaserJet 3100, is based around a 6ppm laser printer engine and produced crisp, well-defined, greyscale photo output with clear tone gradation and sharp edges, scoring 82.4 out of 100 points in our VNU European Labs quality tests.

This "conversation-quiet" machine's copying facility is a versatile feature, offering a range of

resolutions to cope with everything from text to photos. Supplementary options allowed us to collate two or four originals on one destination page.

Dropping a document into the input feeder on either machine launches a menu to copy, scan or fax. Scanning allowed for size and contrast adjustments but the non-technical interface also incorporated other settings: on the 635C, check the box that says you will be enlarging the image later and it will scan at 300dpi rather than 100dpi; place a cross in the OCR box, and when the scan is complete it will launch the bundled Omnipage Limited Edition.

All options could be customised to match our needs. Once the scan was complete, it launched a viewer allowing us to edit and save our image, and the 300dpi optical resolution could be enhanced to a maximum interpolated resolution of 1,200dpi in 24-bit colour.

The 3100, meanwhile, although not scanning in colour, was bundled with fast ReadIris OCR software which launched our word processor and allowed us to edit the scanned text. In our test document, it had no difficulty in recognising £ and \* symbols. Scan to Email did a slightly different job: rather than translating our page into text, it gave us the option of saving it in HP's own JetSuite format or binding it with an integrated executable browser.

With either machine, faxing from applications could be initiated by selecting the fax printer (although in our tests the more usual Send To option did not work from Word), or by dropping up to 20 pages into the 635C's feeder or 30 pages in the 3100 and selecting the fax option from the automatic on-screen menu.

One hundred-speed dials and a 65-page memory speeded matters up considerably with the OfficeJet 635C, and the option to receive faxes either on paper or in the PC's memory meant that we could choose what to do with our messages. Six personalisable cover sheets could be attached to outgoing faxes, while a list option allowed us to send the same document to multiple recipients. The option to schedule faxes meant we could send them outside of peak rate phone hours even if we were no longer in the office.

The 3100's 100-sheet paper feed and 30-page input tray allowed us to leave the machine unattended. Further, documents to be faxed are first scanned into the memory. This places them back into your hands quickly so that you can use

(Below) OfficeJet 635C

(Below, left) LaserJet 3100



them for other things while

the 3100 takes care of the transmission. The 2Mb internal memory can store up to 150 incoming pages, so even if the paper supply is empty you'll still get your faxes.

Both units are true multitasking devices. Our tests proved how easy it was to copy documents on the 3100 while it was sending a fax, without any decrease in throughput or quality. And it doesn't stop there. Multiple separate faxes can be sent in succession without the user waiting for the previous fax to complete.

Nik Rawlinson

### PCW Details

#### HP OfficeJet 635C

Price £531.10 (£452 ex VAT)

Contact Hewlett-Packard 0990 474747  
[www.hp.com](http://www.hp.com)

Good Points Small, quick and easy to use.

Bad Points Slightly disappointing colour printing.

Conclusion Great for the small office and personal user.

★★★★★

#### HP LaserJet 3100

Price £739.26 (£629 ex VAT)

Contact (as above)

Good Points High quality printing and reproduction, combined with fast faxing and scanning features.

Bad Points Non-standard parallel connection may be difficult or expensive to replace.

Conclusion Best buy for the power office user.

★★★★★



## Hardware

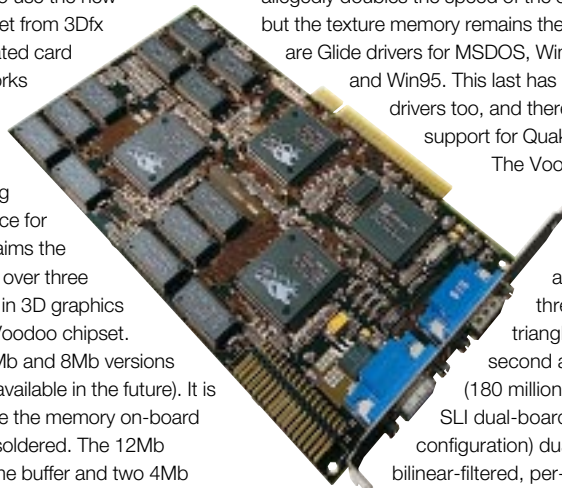


# 3D Blaster Voodoo2

We were bewitched by this 3D graphics card's performance — it's seriously sensational stuff.

The 3D Blaster is the first graphics card to use the new Voodoo2 chipset from 3Dfx Interactive. This dedicated card uses a PCI slot and works with your existing graphics card, whether it is a 2D or a 2D/3D model, providing accelerated performance for 3D games. Creative claims the Voodoo2 card delivers over three times the speed found in 3D graphics cards using the older Voodoo chipset.

It is available in 12Mb and 8Mb versions (a 6Mb version will be available in the future). It is not possible to upgrade the memory on-board the card because it is soldered. The 12Mb version has a 4Mb frame buffer and two 4Mb texture stores (the 8Mb card has two 2Mb texture stores), used by the two texture processors. Both 8Mb and 12Mb cards can handle resolutions of 640 x 480, 800 x 600 and 1,024 x 768 at 65,000 colours. The last does not support a Z-buffer but this can be implemented by adding a second,



identical, Voodoo2 card to your system. This allegedly doubles the speed of the 3D graphics, but the texture memory remains the same. There are Glide drivers for MSDOS, Windows NT 4.0 and Win95. This last has Direct3D drivers too, and there is OpenGL support for Quake.

The Voodoo2 uses high-speed, single-cycle EDO DRAM and delivers three million triangles per second and 90 million (180 million pixels in SLI dual-board configuration) dual-textured, bilinear-filtered, per-pixel MIP-mapped, alpha-blended, Z-buffered pixels per second.

If you don't understand this, don't worry: basically, this card provides the best 3D graphics we have seen; super-fast, with loads of texture memory. We ran Quake II and a preview of

Forsaken, and were seriously impressed with the speed and quality of the graphics.

Adam Evans

### PCW Details

**Price** 12Mb version £229 (£194.90 ex VAT); 8Mb version £179 (£152.34 ex VAT)

**Contact** Creative Labs 01245 265265  
[www.creativelabs.com](http://www.creativelabs.com)

**Good Points** Amazing performance and quality.

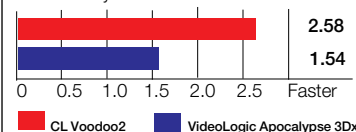
**Bad Points** Not cheap.

**Conclusion** Essential equipment for the obsessive games player.

★★★★★

### Performance results

Final Reality 3D scores

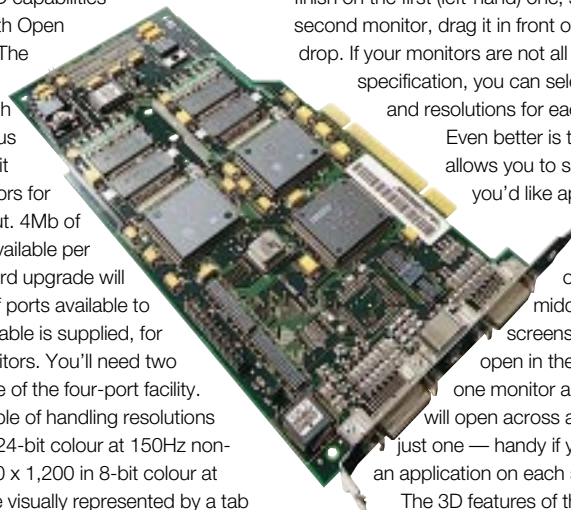


# Appian Jeronimo J3

A 3D graphics card to help you manage your applications in a multi-screen environment.

Appian Graphics' Jeronimo is the latest multi-screen graphics card to offer 3D capabilities and it supports both Open GL and DirectX 5. The J3 is a PCI-based three-quarter-length card, with two Cirrus Laguna 5465 64-bit graphics accelerators for dual-monitor output. 4Mb of video memory is available per port. A daughtercard upgrade will take the number of ports available to four. A custom Y cable is supplied, for attaching two monitors. You'll need two cables to make use of the four-port facility.

The J3 is capable of handling resolutions from 640 x 400 in 24-bit colour at 150Hz non-interlaced, to 1,600 x 1,200 in 8-bit colour at 85Hz. Monitors are visually represented by a tab added by Appian's Hydrovision software to the Win95 Display Properties box. You have the option to turn monitors on and off, and we liked the way you can change the picture sequence: if



you decide, say, that you want your spreadsheet to start on the second (right-hand) monitor and finish on the first (left-hand) one, select the second monitor, drag it in front of the first, and drop. If your monitors are not all of the same specification, you can select refresh rates and resolutions for each monitor.

Even better is the feature which allows you to specify how you'd like applications and dialog boxes to open. Instead of opening in the middle of both screens, boxes will open in the centre of just one monitor and applications will open across all monitors or just one — handy if you want to open an application on each screen.

The 3D features of this card aren't quite up to the standard of those offered by mainstream, consumer-orientated versions. While it managed to render all the textures and layers in our Final Reality benchmark test, some artefacts

were apparent and textures appeared blocky. But it did handle 2D graphics exceptionally well.

Lynley Oram

### PCW Details

**Price** £668.58 (£569 ex VAT)

**Contact** Imago 01635 294 300 (no URL)

**Good Points** Supports Open GL and DirectX 5. Software.

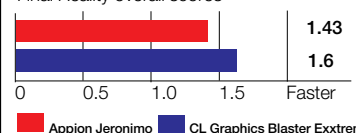
**Bad Points** Non-standard cable.

**Conclusion** An impressively easy way to manage applications in a multi-screen environment.

★★★★★

### Performance results

Final Reality overall scores



## ■ Software

# Lotus SmartSuite Millennium



First looks at the SmartSuite beta are positive. Bill Gates may start feeling the pinch, though.

It's easy to get cynical about the annual round of software upgrades. Every year our desktop applications seem to swell with features and it's often difficult to tell whether the improvements offered really justify the money we spend on them. Here we cast an eye over Lotus' new SmartSuite, codenamed the Millennium edition, just out in beta form and due for release in July.

## Internet integration

Internet integration is the major theme in this upgrade, most obviously marked by the inclusion of a new application called FastSite: an internet or, more specifically, an intranet publishing tool designed with the non-technical user in mind. FastSite automatically converts both SmartSuite and Microsoft Office documents to web formats. It is not intended to replace professional web publishing tools nor to be used on an external commercial site but should make it easier for all staff to publish documents to an internal intranet.

You can publish a whole bunch of related documents direct from FastSite, without having to go backwards and forwards to the applications where they were created. The interface combines site building and page viewing into one screen. So the main window is divided into two panes: a site hierarchy on the left for building and managing your sites; and a tabbed pane on the right which provides a menu of tasks and a way of viewing and editing your documents. Building a web site involves simply adding items to the site pane via menu commands or through drag-and-drop. Relationships between them are automatically established. A selection of pre-designed layouts called Web SmartMaster Looks, make it easy to maintain simple design consistency throughout the pages.



FastSite automatically converts documents to HTML or jDoc; a Java-based file format which retains the look and feel of files with complex formatting, and posts them to either an http or ftp web server. The ability to publish a whole batch of mixed file types (say word processing, spreadsheet and presentation files) directly to the internet or a corporate intranet will almost certainly decrease the time associated with converting and publishing documents to the web.

The individual SmartSuite applications have been revamped for closer internet integration. You can export Lotus 123, WordPro and Freelance Graphics files to HTML 3.2 format and, using jDoc, more complex formatting is retained in Approach database views, 123 spreadsheets and Organiser calendars. The jDoc format is supported by any Java-enabled web browser. The jDoc viewer, a 35K applet, is automatically downloaded to the browser with the published

For a demo of eSuite applications, take a look at [esuite.lotus.com](http://esuite.lotus.com)

document, so there's no need to install plug-ins on each PC.

There is also a whole load of new publishing assistants incorporated into individual applications including Export Assistants in both Word Pro and Lotus 123 which allow the creation of separate HTML files for individual parts of a

document. In Word Pro there are also SmartMasters to help you with your web-page creation as well as a separate web tool bar which appears when creating an HTML document. In Freelance Graphics there is a publishing assistant which can optimise presentations either for higher fidelity or for faster downloading.

Internet integration has been added to the SmartCentre which, like the ToolBar in MS Office, is an all-encompassing information manager giving access to each of the SmartSuite applications as well as extra utilities like a calendar, an address book and numerous pre-prepared business management templates. In this version, the significant inclusion is a tab holding URL references to international weather information, news, and stock market quotes or whatever else you want to put in there. So you can put in your client's URLs or bookmarks for documents on the company intranet. The

## SmartSuite and eSuite

There is no point in denying the fact that SmartSuite, despite its internet orientation, is still most definitely fatware. Lotus has also developed eSuite: a family of products written in Java designed for the network-centric computing environment. The advantage of this suite is that it consists of small and light task-specific applications which are designed to be run off a server and, more importantly for many large corporate companies, require very little staff training.

eSuite bears all the hallmarks of an IBM/Lotus collaborative project. It is aimed at the tens of millions of people still out there who use "green screen" terminals like 3270s and VT-100s. There are two eSuite product lines: a Java desktop environment called the eSuite WorkPlace, and a set of tools for building web applications called the eSuite DevPack. eSuite Workplace provides a set of integrated applets including a calendar, an email client, a word processor, spreadsheet and graphics package while the DevPack provides documentation, sample code, application templates and all the tools you need to customise the core building blocks of the package.

### Document sharing

One of the technologies used in eSuite is Lotus' InfoBus which is a specification for sharing data between multiple Java components in a web page, without scripting. Sun Microsystems will be including this specification as a Standard Extension to the Java Developer Kit, making the InfoBus a Java industry standard, hence progressing the gradual move towards industry standard file formats.

Both SmartSuite and eSuite have been designed to read and write HTML 3.2 and are also XML compliant which allows additional formatting information to be preserved. Theoretically, this means that a 123 spreadsheet full of formulas and formatted values would still maintain its integrity when saved to HTML and passed between eSuite and SmartSuite. Although no-one can really predict how computer architecture will develop in the future, many users will continue to use PC hardware and the fully-fledged application suites which go with it but a more network-centric architecture is also beginning to grow, hence the demand for different kinds of office tools.

maximise button in the SmartCentre expands folders into a full-screen mode with a left-hand pane displaying web pages.

### The IBM connection

Several features in this release of SmartSuite give away the wider market intelligence gained from IBM who acquired Lotus about two and a half years ago. In SmartSuite 97 we saw the inclusion of IBM's Simply Speaking, the discreet speech recognition software which worked with Word Pro. Now, in this new Millennium edition, the speech recognition is provided by IBM ViaVoice which offers continuous speech dictation speeds of 160 words per minute in Word Pro. A limited version of ViaVoice will also be available to use with Lotus 123 which uses a cut-down vocabulary and template forms but which concentrates on high levels of accuracy for numbers. Unfortunately, this has not been included in this beta release so it's difficult to tell exactly how the technology will be implemented.

System management software from Tivoli systems (a division of IBM) has also been incorporated into SmartSuite Millennium providing a set of tools to centrally manage security, licensing and upgrading. This is not entirely new to SmartSuite administrators as Tivoli's TME module has been integrated into the three previous versions of the suite, but in the Millennium edition the TME interface has been incorporated to provide a more formal and better documented link between SmartSuite and Tivoli.

Net.Data has also been incorporated into Approach. Net.Data is an IBM product which provides database connectivity for internet and intranet applications, letting you access practically any back-end database source. Approach includes a SmartMaster Assistant which automatically converts Approach forms and report formats into HTML macros which can then be used with Net.Data.

### The millennium factor

Year 2000 support has also been implemented in this edition in concordance with IBM's industry standard. As the 1st January 2000 draws nearer, so date compliance becomes a bigger selling point in desktop software. Despite the media coverage and the government task-force, there are still many firms which have not yet stopped to face the reality of this potential time bomb. Lotus claims that this version of SmartSuite is year-2000 ready.

SmartSuite has supported both two-digit and four-digit dates for several years. Two-digit dates have always been supported for data input purposes but have been stored internally in the software as four-digit dates. And this is exactly where the problem lies. How does the software interpret and store a two-digit date?

In the past, it was assumed that a two-digit date would fall between 1900 and 1999. For



**Left** The SmartCenter has been revamped with new internet links and a split pane for viewing web pages

**Below** Revamped SmartMasters in Word Pro make the creation of web pages less time-consuming. Notice the much-improved natural language help system (much like that in Microsoft Office 97, only without the patronising cartoons)

written in Approach, which use external data files for date input, these will be treated like any other input. That is; subject to the 80/20 rule.

### Summing up

This beta edition of SmartSuite is missing several important features which has made it impossible for us to carry out comprehensive testing. Organiser, for example is not included, neither is IBM's Via Voice Gold. Many of the help features are incomplete as are the filters for MS Office and

example 05/12/12 would be understood as being in 1912, and 15/06/01 would be understood as being in the year 1901. With the approach of the year 2000, however, this representation of two-digit years becomes problematic as a two-digit year can be interpreted to be in the 20th or the 21st Century, depending on what method your software uses to define such inputs.

This Millennium version of SmartSuite uses a sliding window method of 100 years around the current date (taken from the system date on your computer). Any two-digit year input is then defined in terms of that 100-year window such that 35 may be represented as 1935, but 02 would be represented as 2002. Approach, Freelance Graphics, and Word Pro now use an 80/20 rule for this sliding window (i.e. the window begins 80 years before and ends 19 years after the current year). Organizer uses a similar sliding window method but based on a 50/50 rule where the window begins 49 years before and ends 50 years after the current year.

The good thing about the sliding window method is that it is dynamic. As interpretations of dates are based on the current system date, every year, the sliding window moves forward. So, under the 80/20 rule for example, when the year changes to 2000, the window will include the years 1920 to 2019. In 2001 it will slide to include the years from 1921 to 2020. This 80/20 rule is a default stored in the Windows registry and can be changed if necessary.

Note that dates already stored in existing SmartSuite applications are not affected by the sliding Window rule. Existing dates are stored internally as full four-digit dates. The sliding Window has been included in this version of SmartSuite to interpret two-digit date inputs. It is worth noting that if you have custom applications,

jDoc/Web graphics implementation is only semi-implemented.

It has to be said, however, that the features included so far in this beta are impressive and the many improvements and refinements made to the individual applications to enhance internet/intranet integration make SmartSuite Millennium Edition a must-have upgrade. FastSite provides all the necessary tools for hassle-free internet publishing and many steps have been made which push forward the effort towards creating more universal file formats.

For any company considering the potential of an NC architecture, SmartSuite's ability to exchange files via HTML and Extensible Markup Language formats with Lotus' Java-based eSuite applications will prove essential. One thing which the Lotus/IBM marketing team seem to have got right is that desktop productivity software can now exist on a variety of different architectures and if these architectures are going to co-exist, they must be made to complement each other.

Eleanor Turton-Hill

## PCW Details

**Price** £351.33 (£299 ex VAT)

**Contact** Lotus 01784 455445, [www.lotus.com](http://www.lotus.com)

**System Requirements** Windows 95 or NT 4.0

**Good Points** Enhancements in internet integration and the restrictive barriers caused by proprietary file formats.

**Bad Points** A pity that this beta is so incomplete. Stability and performance were poor.

**Conclusion** If I were Bill Gates, I would be getting worried about SmartSuite. This release has many features which will make the product more attractive to a much wider base of users.

★★★★☆



## ■ Software

BETA

**Personal  
Computer  
World**  
**Recommended**

# Adobe Photoshop 5

Text editing has been improved and you can follow history, making multiple undo a breeze.

Although it has been only 18 months since Photoshop 4 hit the streets, it seems like I've been using it for years. In that time, the wish list of most wanted new features has grown steadily longer. It started with multiple undo, better text facilities and support for spot colours and grew to include better overall colour support and more live previews. As other packages introduced new features they were tagged onto the end of our Photoshop wish list and we wanted to see instant effects filters for drop shadows, magnetic selection tools for easy cut-outs and better support for creating indexed colour images.

And the good news is that Adobe has listened. Photoshop 5 includes all the above and more besides. The interface is reassuringly familiar, in fact to look at it, you'd hardly notice any change. But the first thing you notice (the actions palette now sports an additional tab-labelled history) is probably the most fundamental addition to Photoshop's feature set and the one thing that will most change the way you're used to working with images.

## History palette and snapshots

I must admit, my idea of multiple undo was to keep pressing Control/Z until you got back to where you wanted to be. The history palette takes that as a starting point and then travels a few miles down the road with it. Each time you do something, it's recorded as a "state" in the history palette in much the same way as you're used to seeing in the actions palette. You can zip back and forth through all your editing steps, simply by clicking on any state in the history palette. If, having skipped back to a previous state, you start editing the image, all the subsequent states are deleted from the palette and you start over from that point. The undo command works independently of the history palette (undo removes the most recent state from the history palette) so you can, for example, delete the last half dozen states from the history palette, then get them back by selecting undo from the Edit menu.

The number of actions the history palette can track is dependent on available memory and scratch disk: when you run low on these resources, older actions are dropped from the top of the list to make room for newer ones at the bottom. Even with a fairly limited platform (a P120 with 32Mb RAM and about 100Mb spare on the hard drive) I managed to build a respectable length history. You can create a snapshot of any stage and these remain in the history palette even after the associated steps have been deleted.

Snapshots can be used simply as staging posts to mark a satisfactory outcome of a particular process and you can use them to make



**Left** Up to four colour samplers can be placed within the image to give before/after readout of pixel values during adjustments. You can select individual, or averaged pixel values for the readings  
**Below** Layer effects like this drop shadow can be previewed live and edited at any time until the text layer is rendered

before-and-after comparisons. Snapshots make it much easier to experiment. Currently, if you want to try different techniques on an image, you need to have a saved copy of the original, try method A and save a copy, revert to the original document, try method B and save another copy, then open up A and B side by side to make a comparison (before, of course, rejecting them both and moving on to C). Now you can make a snapshot of the original state, try method A and snapshot it, try method B and snapshot it, then simply click on the snapshots within the history palette to compare. It's also a simple matter to save the snapshots (or any other state in the history palette) as documents should you want to.

## A brush with history

The history brush is a new tool to go with the history palette. It allows you to clone from a snapshot or state into the current image window. So, if you've experimented with a filter on the entire image and created a snapshot but then reverted to a previous state in the history palette, you can selectively paint from the snapshot onto parts of your current image.

One of the history palette options allows you to record non-linear histories. In other words when you go back and edit a state, the subsequent states are not deleted and you have



two (or more) edit paths from that state onwards. To say that this may confuse things is undoubtedly to understate the case but if you're comfortable playing chess, reading a book and watching TV simultaneously, you probably won't have a problem with it.

## Time for type

If the history palette is Adobe's surprise new feature then the improvements to type editing probably fall into the "this is great, but should have been in the last version" category. It's fair to say that until now Photoshop's type capabilities were nothing short of abysmal. Now you can set type and adjust size, colour, leading, tracking, kerning and baseline shift and see the results previewed live in the image window. What's more, type lives in its own editable layer until you decide to render it.

There's a new bunch of one-step layer effects designed for type (although they'll work on any layer) and you can even edit type that has had

transformations and layer effects applied. To anyone made weary by the process of creating drop-shadowed text, only to have to start over again when it's been edited, this will be a godsend. And, though not normally prone to noisy emotional displays of approval, I'm not ashamed to admit that I found myself whooping and hollering while looking at these features in the beta.

The layer effects include drop shadow, inner shadow, inner and outer glow and bevel and emboss. Once applied, these effects remain "live", which means you can go back and edit not only the type but also the effects. You can increase the depth of the shadows, change the angle, change the colour, or take them off and try something else. Only when the type layer is rendered do you lose these options.

### Wider selection

New selection tools bring Photoshop up to speed with developments in other image editing packages.

There's now a magnetic lasso which seeks out high-contrast boundaries, allowing you to be less than precise when drawing around easily isolated areas. The magnetic pen does the same for Bézier paths and a freeform pen lets you quickly sketch rough paths (in other words it works like a lasso but draws paths). I'm not sure this is going to be of any actual use, but there you are.

### Other new features

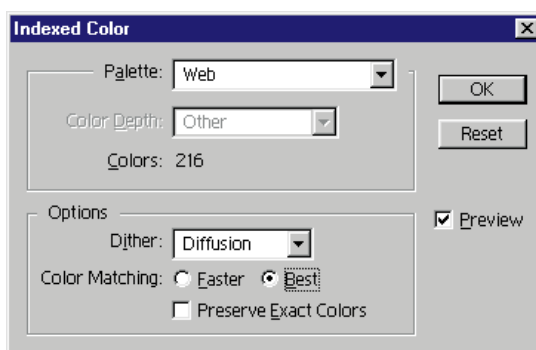
Colour samplers expand the functionality of the info palette, allowing you to simultaneously read colour values from four locations within the image. Placing these in highlight, midtone and shadow detail or in areas of important colour will give feedback that will make life easier when making colour corrections and other adjustments.

Another new feature which holds promise but delivers little, is automation plug-ins. These automate complex routines using existing functions. Photodeluxe uses much the same thing to guide novices through tasks like red-eye removal. If the resize image assistant featured in the beta is anything to go by, though, Adobe has taken a wrong turning here. Photoshop users, for the most part professionals who know what they're doing, would rather get their hands on the real tools for doing this kind of thing (they offer more power and flexibility) and that's why they choose PhotoShop in the first place. If you want batch processing of repetitive tasks, the actions palette already provides that and has been enhanced in version 5 to include more program operations including the paths, layers and history palettes, the gradient marquee, crop lasso, line, move, magic wand, paint bucket and type tools, lighting effects, calculations, apply image, file info and free transform commands.

Less easy to evaluate in terms of its potential is the 3D transform plug-in, which performs the clever trick of manipulating 3D objects in a 2D image. A pack shot, say, can be manipulated to



**Left** The History palette shows snapshots at the top, and states below. The last three states show the application of the ripple filter followed by use of the history brush to paint the ripple effect onto the preceding state; the effect has then been faded. The three buttons at the bottom right let you save a snapshot or state as a new document, create a snapshot from a state and delete a snapshot or state from the palette



**Left (offset)** More control, but not enough, from the indexed colour conversion dialog

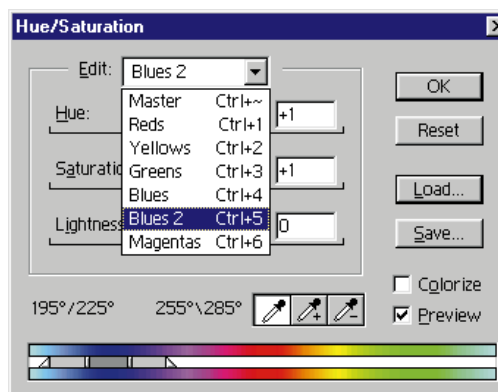
little more control than was previously the case. It's surprising that Adobe has decided not to take this aspect further and introduce palette optimisation along the lines of that provided by Equilibrium's Debabelizer.

New layer alignment commands allow you to align and distribute the contents of separate, linked layers. The free transform command works on paths and selection marquees, there are three

new gradient styles (angular, reflected and diamond), you can specify spot colour channels for CMYK images, there's support for 48-bit RGB and 64-bit CMYK images, improved hue/ saturation control and a revamped curves dialog.

There are upgrades you can live without, but Photoshop 5 will not be one of them. Its two big features (the history palette and editable text with character-level formatting) on their own justify making the move. The numerous other significant additions and enhancements together with so many other minor improvements too numerous to mention make it an absolute necessity for any self-respecting professional or serious amateur.

Ken McMahon



**Above** Enhanced control from the hue/saturation dialog

show the view from another perspective. First, a wireframe grid is drawn around the object, which is then panned and rotated until the required view is achieved. You can also set a dolly value which changes the size of the object.

If you make drastic changes to the perspective (say turning an object through 90 degrees) you'll have a lot of retouching to do to recreate surface detail — most people would probably choose to create this type of thing in a 3D modelling package. But for tweaking pack shots for greater impact and creating special effects, 3D transform could come in very handy.

As you'd expect after all this time there's very little of Photoshop 4's existing repertoire that hasn't undergone some kind of facelift. You can preview duotone settings in the image window while the dialog box is still open, and the same goes for the indexed colour dialog which offers a

## PCW Details

**Price** Street price (est) £763.75 (£650 ex VAT)

**Contact** Adobe 0181 606 4001

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

**System Requirements** Windows 95 or NT 4.0

**Good Points** History palette turns multiple undo into an art form in its own right. Improved text editing. More flexibility for experimentation. Greatly-extended live preview facility.

**Bad Points** Support for producing indexed colour images for the web could be better. Web designers will need to consider other packages for post processing.

**Conclusion** In almost every respect an exciting and much-awaited upgrade: a must-have for every user of Photoshop 4.

★★★★★

## Software

# Microsoft Outlook 98

Pull your office together: the outlook will be bright and calm with this comprehensive organiser.

A typical office might have different email packages for internet and external messages, a scheduling system and maybe even a contact manager. Microsoft's Outlook is an attempt to combine all those functions in one application. So it includes a task manager, contact book, to-do lists, email for both internet and LAN systems, scheduling, which can be used to track Office documents that you've worked on, or keep a record of when you send and receive email for selected recipients: a potentially valuable feature for many, especially those who want to be able to bill by time.

You can download Outlook 98 from the MS web site. Setup is lengthy, requiring an installation of Explorer 4. And why the "active installer" wanted a total of 120Mb free space remains a mystery. When you run the application for the first time, you'll be presented with the usual inbox setup wizard, allowing you to configure the program for the different services with which you want to use it.

There's still more work to do afterwards; unlike previous MS attempts at packages that can handle internet mail, Outlook 98 has a reasonable set of options that even allow for quoting the formats and types of content more commonly found on the internet. It's a shame they're set to defaults that will irritate lots of net users, but you can change them easily. There's welcome support for other internet standards, including S/MIME, LDAP and IMAP. If you have standards-based mail and management systems, you should have no problems integrating Outlook into them.

Perhaps the best feature of the program is the Outlook Today screen which will show you a quick summary of messages, things to do and appointments on one screen. Double-clicking on an item will allow you to change it, and you can mark entries in the To Do list as "done" straight away. You can even search the contact book directly. What you can't do is right-click on an entry to select its properties, which seems a strange omission these days.

There are other features too, which will be welcomed by many. You can tag messages as originating from known senders of junk mail, or of adult messages, and Outlook will attempt to filter them. Updated filters can be downloaded from the Microsoft web site and that feature alone might make Outlook 98 worth using for many net users. There are also plenty of other ways to filter email messages, and options for using the internet for collaborative meeting requests.

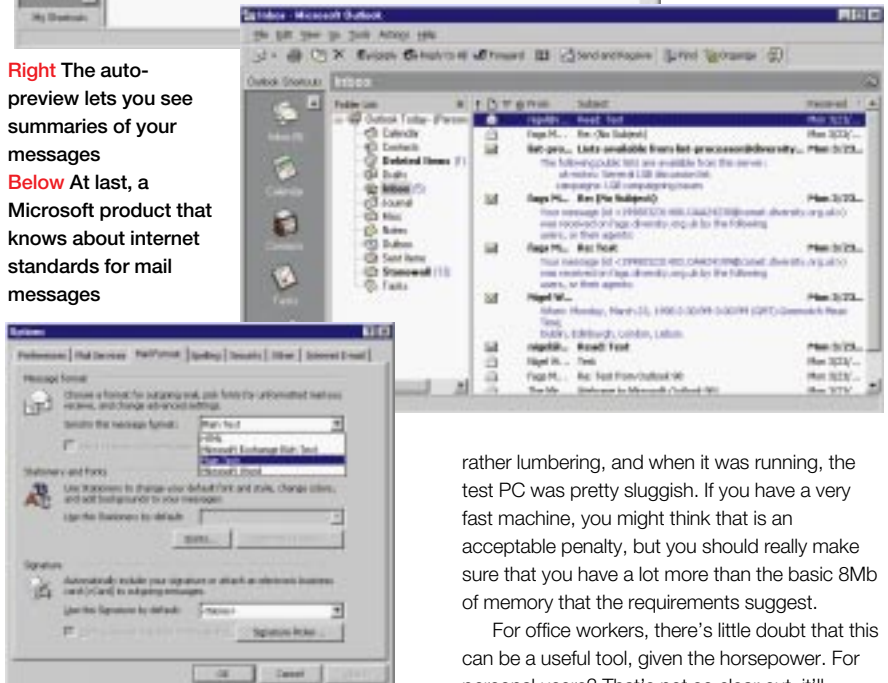
Using the features is helped, as you'd expect in Microsoft software, by the perky paperclip, and a fairly comprehensive set of help files, although it can be hard to find some information in them: there was no reference to the adult email facilities, for instance, and it was more by accident than



Left Outlook Today is a simple summary of everything you have to sort out right now

Right The auto-preview lets you see summaries of your messages

Below At last, a Microsoft product that knows about internet standards for mail messages



anything else that enabled their use. Much of the rest of the package is very straightforward, with a wide selection of views to help you see your information in the most efficient way possible, but there are some strange anomalies. One of the most confusing for many users is likely to be the presence of both the Personal Address Book, installed with the mail services that you choose, and the Contact Manager, which can also store information such as email addresses. Yes, you can fill in email addresses for people in the contact manager by clicking on the Personal Address book, and entering them from there, but it does seem a little confusing, to say the least, to have both there, with potentially different groups of people in each.

There's one bigger niggle than that, however: performance. While there's no doubt that Outlook 98 is an impressive (and long overdue from Microsoft) internet-aware piece of software, it's

rather lumbering, and when it was running, the test PC was pretty sluggish. If you have a very fast machine, you might think that is an acceptable penalty, but you should really make sure that you have a lot more than the basic 8Mb of memory that the requirements suggest.

For office workers, there's little doubt that this can be a useful tool, given the horsepower. For personal users? That's not so clear cut; it'll certainly do everything you want, but it does a lot more, too, and you might be better off with a smaller, faster, email program like Eudora Pro.

Nigel Whitfield

## PCW Details

**Price** Free before 1st July 1998; then free for registered users of Office 97, Outlook 97 or Exchange server

**Contact** Microsoft 0345 002000  
[www.microsoft.com/outlook](http://www.microsoft.com/outlook)

**System Requirements** Windows 95 or NT 4.0

**Good Points** Feature packed and compliant with lots of internet standards.

**Bad Points** A little sluggish and slightly confusing address book.

**Conclusion** A useful tool, but probably over-rich in features for home users.

★★★★★



## Software

# Illuminatus 4



This multimedia authoring package is easy to use, with some features well above its station.

Illuminatus, a UK product, has been one of the success stories in multimedia authoring software for two main reasons: it is very easy to use (there is no programming language to learn) and it has always been superb value for money. When the first version appeared, about six years ago, it came on two floppy disks and was priced at £99. The latest version fills four CD-ROMs and sells for only a third more: probably one of the steepest falls in price per megabyte of any software we have reviewed.

The application lets you combine text, images, video clips, animation and sound into interactive or passive multimedia publications which you can play on your PC or distribute on floppy disks, CD-ROMs, or Zip drives.

Illuminatus publications are like books and individual computer screens are pages. Pages can contain frames which hold your images, text, videos, animations, slideshows of graphics, buttons, hotspots and so on. Frames can be decorated with a background colour or image and various types of outlines, including drop shadow effects. They can be set to pop up or be revealed on request and can also be set to accept text input by the user. And they can appear and disappear with transitions (now customisable), and launch background music, sound effects, or other events.

Special effects now include transparency: a particular colour on a button, slideshow, image or a video clip can be treated as transparent, thus allowing irregular-shaped objects to be used for these items and you can set the level of transparency required.

Text to be displayed on a page can be input from ASCII or RTF files, or typed or pasted in, and incorporated as part of your application, or it can form a link to an external file to facilitate updating. A nice little feature is one which enables you to elect not to show half-revealed lines at the bottom of a window when scrolling text. Font design, style, size and colour can be set for the whole application or page, or for selected words or phrases and you can distribute fonts with your applications, provided you have copyright permission.

Pages can also include objects to trigger actions such as starting or stopping a multimedia clip, navigating to another page, launching another application, printing a page or file, saving text to disk for storing users' progress or answers to questions, or revealing or hiding another object. And the full range of transition effects can be applied to individual objects on a page.

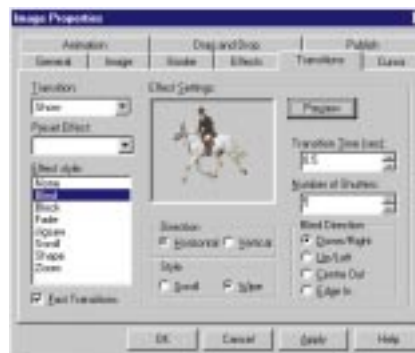
An unusual, useful, feature is AutoNarrate. This combines an audio file (a narration or a song) with a text file, so that words in the text are highlighted as they are spoken. It works automatically but you can also make adjustments



Left Main screen, where most construction takes place

Below, left Transition effects

pages, with support for animated gifs, jpg images and ActiveX controls. But if you wish to combine the internet with



to the timing, for perfect synchronisation. The feature clearly has a use in children's stories, applications to do with reading skills, language tutorials, music-related applications and so forth.

In addition to ease of use and low price, Illuminatus has another important plus point which keeps its head above water in a fiercely competitive global market: its versatility. The many features added to this latest version enable you to use it for anything from passive slideshows, demonstrations, portfolios, catalogues and web pages to interactive presentations, electronic books and interactive CVs, even Windows screensavers. Unlike Asymetrix ToolBook, which is focused on educational applications, and Macromedia Director, which is orientated towards fancy presentations, Illuminatus is flexible enough to be used effectively for almost any purpose: business, entertainment, education (there's an in-built scoring facility).

As you might expect, some of the most important new facilities relate to the internet. The program can publish your creations to HTML

a local application, say on CD, Illuminatus now supports Internet Explorer as an object on a page in your application. For distribution purposes, no royalties are payable, and there's a facility for creating a setup program so your applications can be easily installed on other machines. The program can also create Win95 Autorun files.

Illuminatus may not have all the souped-up features of some of its specialised competition, nor the power of a scripting language, but it doesn't fare at all badly against any of its competitors on facilities and has the advantages of flexibility and ease of use. Not everyone needs a Formula 1 racing car: Illuminatus is a responsive, turbo-charged sporty family saloon which will be enough for many people, and will not break the bank.

Panicos Georgiades and Gabriel Jacobs

## PCW Details

**Price** £176.19 (£149.95 ex VAT)

**Contact** Digital Workshop 01295 258335  
[www.digitalworkshop.co.uk](http://www.digitalworkshop.co.uk)

**System Requirements** Windows 95/NT4  
**Supported file formats** Sound: WAV, MID and CD-audio. Animation and video: FLI, FLC, GIF, AVI (and MPEG and MOV via Windows Media Control Interface drivers.) Images: GIF, CGM, CDR, EMF, JPG, PCD, PNG, TGA, TIF, BMP, WMF, WPG, PCX at anything from 16 colours to true colour. Includes an OmniPalette facility for 256 colour apps.

**Good Points** Cheap, easy to use, versatile.

**Bad Points** Hard to fault at the price.

**Conclusion** Best value-for-money multimedia development tool, with some features you won't even find in £1,000 products.

★★★★★

## Software

# Autonomy Agentware Suite 2.1

Everyone needs an intelligent agent — you can walk the dog while searching the internet.

**A**utonomy Agentware is billed as “Intelligent Agents for the Internet” and can, in theory at least, follow all those links for you. It will even discriminate between information that’s useful and stuff that’s not. It does this by using “agents” which you train using plain English, before setting them free to search the net on your behalf. Really plain English? Yes: we created a new agent and told it we wanted information about “Diana, Princess of Wales, formerly Lady Diana Spencer, killed in a Paris car crash with Dodi Al Fayed. Often known as Lady Di.” That was enough for Autonomy to find plenty of information. You can then refine the tactics by saying what you don’t want to know about, or highlighting an article that’s been retrieved and asking the system to “re-train” your agent based on that article, which is similar to the “More like this” feature found on some web search engines.

There are various components in the Agentware Suite; the most obvious of which is the Web Researcher, which will find articles from the web and, optionally, add them to a library on your hard disk, which you can then query using plain English. Next comes the Image Researcher, which we found produced a good selection of pictures. It will build a thumbnail page for you, showing all the things it’s found, and you can select a minimum and maximum size, helping to cut out small buttons from web pages, for instance.

The Press Office uses a similar technique to the web researcher, but is based on news sites, and is capable of managing the logging-on that some of these sites require. You can select which of your agents you want to work with the press office, and Autonomy will build a custom newspaper by culling articles from around the world.

All this, of course, like other types of web searching, is done online, and while Autonomy can find information quickly, it can also sometimes be a little on the sluggish side. We might well have found just as many pictures of Princess Diana by looking ourselves, for instance.

Fortunately, another part of the suite, Agent World, takes care of this. It provides a range of



**Left** The Autonomy desktop: a doggedly different interface

**Below, left** Image researcher can compile thumbnails of all the things it’s found

**Bottom, left** Autonomy will build you a customised newspaper every day

All this sounds great and, to an extent, it is. There are a few niggles, though. The first is the rather cheesy interface, which represents each agent by an animated dog. You may



like it or hate it but it certainly does little to make the package easier to use. The application is a little sluggish at times, launching different components and not appearing to respond instantly when you click to recall an agent from its searches. You’ll also need to spend time on training: it’s not a quick solution for some topics, although it’s certainly a useful one for many. The user interface, too, seems a little dated; instead of multiple menu options to change the way an agent behaves, can’t we please have a modern tabbed dialog box? Context-sensitive help would be a boon too, as newcomers may find the program a little confusing, certainly to start with.

One other more serious niggle: the application is very particular about your Winsock, and if you have a non-standard one, you may well have lots of problems. Those niggles aside, this is a useful package, and it will track down the information you want, but it rewards thought and proper training. If all you want is a quick list of sites, stick with your favourite search engine.

Nigel Whitfield

offline facilities — including dating for those who want to find people with similar interests — the most useful of which is the Kennel. Your agent can be sent to the kennel, where Autonomy’s servers will look after it, continuing the web search, though not, unfortunately, image searches, until you decide to connect again and retrieve the results.

## PCW Details

**Price** £49.99 (£42.54 ex VAT)

**Contact** Autonomy Systems 01223 421220  
[www.agentware.com](http://www.agentware.com)

**System Requirements** Windows 3.11 or 95

**Good Points** Effective searching based on English descriptions.

**Bad Points** Can be confusing to newcomers. Doesn’t work well with all Winsocks.

**Conclusion** A powerful searching tool that rewards careful use, but still with rough edges.

★★★★☆

## ■ Software

# Caere OmniForm v 3.0

Form-filling has gone technical — this software lets you scan forms into an editable format.

**O**mniform is an application which enables you to scan-in paper forms and automatically convert them from bitmaps into editable electronic forms. It uses a sort of forms-specific OCR technology, otherwise known to Caere Corporation as Logical Forms Recognition (LFR). This attempts to recognise form elements like boxes, labels, graphics, and check boxes. The idea is to transform your office's static paper documents into dynamic electronic forms as efficiently as possible.

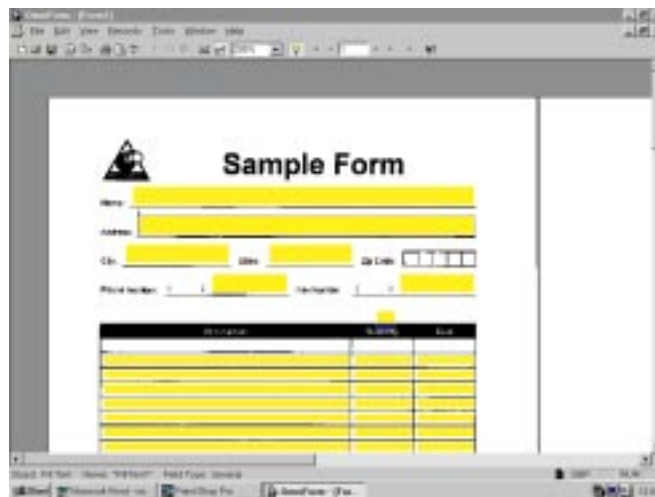
Omniform has already been through several incarnations, and here we take a look at the newly-released version 3.0. Both the LFR and the OCR technology have been refined in this version, but there are loads of other bells and whistles which attempt to integrate OmniForm more closely with other common office applications.

My scanner was included as one of over a hundred on Caere's compatibility list, but installation was nevertheless fraught with difficulty. In essence the problem revolved around TWAIN technology which is sadly taking its time to become a true universal standard. TWAIN is the programming interface (API) which defines how input devices such as scanners and digital cameras pass information to applications.

Suffice to say that TWAIN has not yet got there. This is borne out by the release notes which come with the product outlining a list of "exception" scanners and detailing their particular foibles when in operation with Omniform. Be prepared to try a scanner-specific driver, a TWAIN-default driver, reconfigure your datasources in OmniForm's Scanmanager, reinstall different bits in different orders, phone your scanner company for an updated TWAIN driver, and generally do the PC hockey cokey. If you need help from Caere, you'll have to phone the technical support line in Germany... yes, Germany; another wind-up you could do without.

Assuming you are prepared to read on, there are some good things to say about Omniform. Once properly configured and talking politely to your hardware, OmniForm 3.0 is a pretty impressive application. This version makes particular headway in improving its integration with the rest of the software on your desktop. It's possible to send existing electronic forms from other applications to OmniForm. Forms created in Microsoft Word, Excel or even a database application can be simply "printed" using the ordinary Print option in the File menu to Omniform where they are converted into its native format.

For each form created in version 3.0, Omniform automatically creates a flat file database, and new sharing capability in this version allows multiple users of Windows NT servers to fill out a single form and save records



**Left** Here's an example of Omniform Filler. In this case the form has been scanned-in ready to receive data without being put through the LFR process

**Below** A form created in an Excel spreadsheet can be converted to Omniform by using the Print option from the File menu

to a single, centralised, database. If you have a custom database written in dBASE, Access, Paradox or any other common database application, there is also an enhanced ODBC driver which lets you export records in the relevant format.

When installing Omniform there are two major application elements: Omniform and Omniform Filler. The filler part of the application is designed for occasional users of forms. It does not convert the form using LFR technology, but retains it in its original uneditable state allowing users to perform simple operations like filling out, printing and distributing information. A new "runtime filler" module facilitates these simple functions by allowing the user to distribute a form with an executable filler attached. This means recipients of a form do not need the Omniform filler application installed on their computers to enter and return data. The filler provides a simple way of collecting data which can then be imported back into the Omniform database.

In operation, OmniForm's enhanced OCR and LFR technologies worked well, but a fair amount of manual correction is still required. It is clear however that the scanning process from poor-quality or photocopied documents has improved. The OCR technology used in this software is taken from Caere's Omnipage Pro Version 8.0 and reveals a definite step up from its previous incarnation. The drawing and form-editing tools have also been given a revamp including several powerful features like the creation of drop-down lists holding a maximum of 500 options, and a



recalculation prompt which retrospectively alters existing records after changes in calculation formulas. Omniform has shown itself in this version to be more than just a one-function application which converts paper documents to electronic documents. It's also a powerful tool for creating and distributing your own forms, as well as integrating data with other office applications.

**Eleanor Turton-Hill**

## PCW Details

**Price** £99 (£84.26 ex VAT)

**Contact** Caere 0171 2223200  
[www.caere.com/omniform](http://www.caere.com/omniform)

**System Requirements** Win95 or NT.

**Good Points** Excellent scanning accuracy and great integration.

**Bad Points** Configuration proved difficult.

**Conclusion** Much-improved technology, at a cheaper price than the previous version.

★★★★★



## Software

# AND Route 98 UK and Ireland & Europe

Route planning at home and across the Channels — these packages help you find your way.

If your business or pleasure takes you to lots of different places then route planning software is more than useful: it is probably essential. But for occasional and leisure use it tends to be processor demanding, hard disk hungry and expensive to buy.

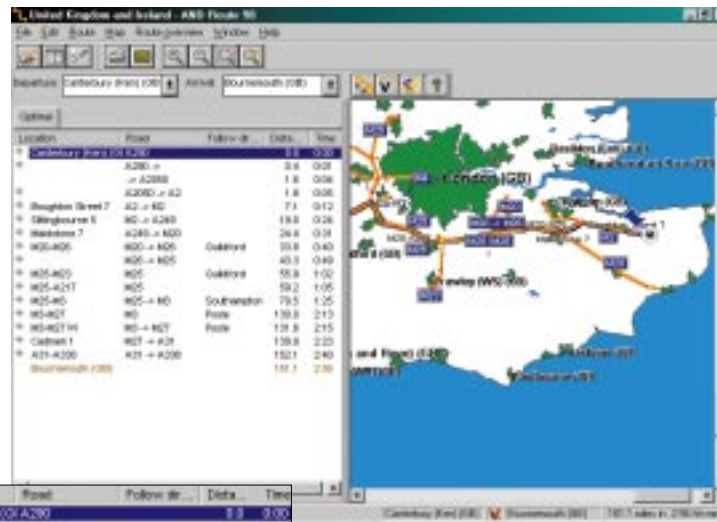
However, there is an exception. The AND Route 98 titles, one for Britain and Ireland and a functionally identical one for Europe, are basic route planners that do little more than plan your route from A to B, with a couple of diversions along the way, but out of the box they are easy to learn and easy to use. They can be run on a 486, they don't occupy a large chunk of your hard disk, and they come at an affordable price.

Of course, the affordable cost is reflected in the limited features. AND Route 98 will plan your route from A to B and it will do it to a fine degree of detail. You can throw in a couple of diversions along the way and you can print out a map as well as the directions. But there are no photographs, no gazetteer, no listing of motels, hotels, restaurants, golf courses, theme parks or sights worth seeing along the journey, and its options and customisation preferences are few.

This is not meant as a criticism. A product should be criticised for not being what it was intended to be: AND Route 98 was not intended to be feature-rich and content over-heavy. It was designed to do a basic job and it does that job satisfactorily.

One of the criticisms of AND Route 97 was that it didn't plot routes with the degree of accuracy that products like Microsoft's AutoRoute do. This possibly remains true if you are travelling to small places but in the tests we ran, it identified most towns and cities. This accuracy should now be even greater because the number of places on the AND Route 98 upgrade has been increased by 60 percent to 35,000 cities. The number of roads has been increased by 55 percent to bring the total number of road miles mapped to 180,000. So if you want to get to somewhere very small, you may not be guaranteed of finding it on Route 98, but you will certainly get very close to it. The map is rather rudimentary (not a patch on the detail of AutoRoute) and I found it difficult and slow to navigate under magnification.

The text instructions are rather complicated when compared to Microsoft's AutoRoute. For



Left Screen showing maps and directions

Below, left AND Route 98 is easy-to-use and basic, but the route directions are inferior to those given in AutoRoute (shown, below right)

Location	Road	Follow Br.	Data	Time
Canterbury (UK) (A290)	A290 →		0.4	0:01
	→ A290		1.8	0:04
	A290 → A2		1.8	0:05
Boughton Street 7	A2 → M2		7.1	0:12
Sittingbourne 5	M2 → A249		19.0	0:24
Maidstone 7	A249 → M20		24.4	0:31
M20-M25	M20 → M25	Guildford	30.8	0:40
	M20 → M25	Guildford	49.3	0:49
M25-M23	M25	Guildford	55.9	1:02
M25-A217	M25		69.3	1:06
M25-M3	M25 → M3	Southampton	79.5	1:25
M3-M27	M3	Fosse	138.0	2:13
M3-M27	M3 → M27	Fosse	139.8	2:15
Cadnam 1	M27 → A31		139.8	2:20
A31-A336	A31 → A336		152.1	2:40
Bournemouth (UK)			161.1	2:56

Distance	Instruction	Point	Pos.	Dir.	Town
0.0	Depart Canterbury, West	A29	5.0 mi	W	Canterbury
1.8	Bear right onto	A2	6.8 mi	W	
7.5	At A271 J5, bear left onto	M2	12.3 mi	W	Maidstone
19.0	At M2 J5, bear left onto	A249	5.7 mi	SW	Maidstone
25.5	At M20 J3, bear right onto	M20	8.0 mi	W	Deal
34.9	At M20 J3, bear left onto	M25	9.8 mi	W	Taversham
44.0	At M25 J5, go onto	M3	35.3 mi	W	Redhill
79.3	At M25 J12M3 J1, turn left onto	M3	51.1 mi	W	Dealingsgate
130.4	At M3 J14, bear right onto	M27	5.7 mi	W	
140.1	At M27 J1, go onto	K31	11.8 mi	W	Pinewood
152.1	At A31, turn left onto	A336	8.5 mi	E	Bournemouth
161.5	Arrive Bournemouth, Bournemouth				

example, AutoRoute will tell you in simple language: "At M20 J3, bear left onto the M26". Even a child can understand that, but AND's rather arcane "M20-M26 M20-> M26" is more confusing. Seeing that occasional and home users are those most likely to buy AND Route 98, giving clearer route directions is something AND really should look at for Route 99.

Route 98 gives an estimated journey time and distance covered. Comparison with AutoRoute on a journey from Canterbury to Bournemouth showed that both programs took the same route, Route 98 estimating a journey time of two hours 56 minutes to cover 161.1 miles, while AutoRoute estimated two hours 35 minutes to cover 161.5. One might draw from this the conclusion that Route 98 favours the slower motorist.

Turning to Route 98 Europe, it now covers 50 countries instead of the 27 covered in Route 97, so that's a considerable increase. Both CD-ROMs are for installation only — you don't need to have them in your CD-ROM drive to run the program — and a comprehensive manual is included on the disc with a free copy of Acrobat Reader, which you need in order to read it.

Overall, Route 98 is an excellent route-finding

utility that in my opinion is badly let down by the near incomprehensibility of its written instructions: no doubt these become clearer after continued use, but for the occasional user, inexperienced map reader, or motorist trying to follow the directions, check the road signs and drive at the same time; they let the product down. If AND can rectify this, it is possible that for the sometime user AND Route could be the route finder of choice.

Paul Begg

## PCW Details

**Price** UK and Ireland £24.99 (£21.68 ex VAT); Europe £29.99 (£25.52 ex VAT)

**Contact** AND Publishers 01865 200800  
[www.andtech.co.uk](http://www.andtech.co.uk)

**System Requirements** Windows 3.1 or 95

**Good Points** Easy to use, doesn't require a high-spec machine.

**Bad Points** Written route directions aren't easy to understand.

**Conclusion** Given its limitations, these CDs provide basic route planning at an affordable price.

★★★★★

## Software

# IMSI Family Heritage v2

Going back to your roots? This program lets you trace your family tree and its many branches.

One of the problems when buying software these days is that an application can be licensed to several different companies and sold under different names. Early versions of an application can turn up renamed and repackaged as a budget title, or one company can sell some or all of its titles to another company which renames them. The latter has happened with Corel Family Tree Suite.

Last October, the Corel Corporation did a deal with IMSI in which the latter bought several of Corel's software titles: among them, the Family Tree Suite, which IMSI has now upgraded to Version 2 and renamed Family Heritage.

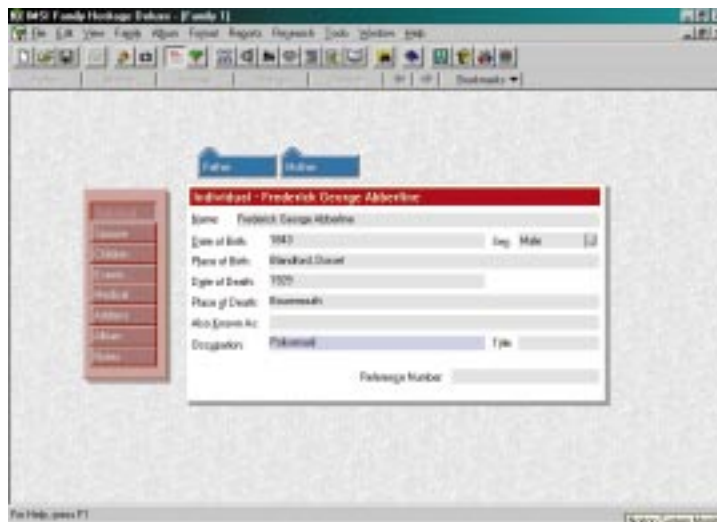
It comes in two versions: an ordinary version and a Deluxe version, the former lacking features and some of the research material found in the latter. Since most of the research material is US-centric and therefore of no value to anyone researching their family outside the US, on the face of it the ordinary version would appear the best buy. However, as we'll see, some of the features only found in the Deluxe version are well worth having.

First, though, Family Heritage is extremely easy to use. On first starting the package you enter information about yourself on a card. You then complete cards about your immediate family — spouse, children, parents — and your relationship to these people being automatically associated. For more detailed information you use additional cards. This is extremely important. The chief requirement of any genealogical database is that it has the ability to handle the huge quantities of information that even the most modest search can start to produce as well as deal with the complexities of some family relationships. In this respect Family Heritage handles almost anything you can throw at it.

Family Heritage also has an area for the all-important entry of source material. For anyone tracing his or her family tree, the Golden Rule is "Keep an accurate and detailed record of where your information came from". Family Heritage allows you to do this, although only the Deluxe edition has a useful tool called the Source Manager which enables you to review and manipulate all the sources you have used.

The Deluxe version comes with a lot of research tools such as the US Social Security Death Index, but most of them are exclusively for the US and therefore useless if you are researching your family history elsewhere.

It has features like the Names database which make the Deluxe version worth considering even though there is a significant £15 price difference. For example, the ordinary version lacks several very useful tools and features. It lacks the useful Date Calculator tool which identifies the exact age



Left The information entered on the initial card is basic: little more than name, sex, and various dates and places  
Below The Deluxe version has a database of 200,000 surname histories which users everywhere would value

of an individual in years, months and days, and will tell you the day on which a certain date fell. Equally useful but absent is the Relationships Calculator which identifies the exact relationship between any two individuals and identifies the common ancestor if they have one.

The ordinary version lacks Data Integrity Checking and there's limited searching (you can't search by address, blood type, cause of death, occupation and so on). There's no Snapshot feature (which lets you keep individual details on screen while navigating to compare individuals), no Criteria Selection (identify individuals graphically) and no Bookmarking (the ability to flag individuals currently being researched or frequently referenced). You can only incorporate multimedia sound and video files if you have the Deluxe version and it is the only one to include Corel Photo House, which can be used to retouch and edit scanned photos.

As one might expect from both Corel and IMSI, both companies being involved in the product's graphics and design, Family Heritage is strong on providing many superb ways to produce attractive family-tree printouts. There are lots of Masterclips images, backgrounds, borders, photos and fonts to make them as attractive as possible.

It has the tools needed for you to publish your genealogy on the internet. And on the subject of



the ubiquitous internet, it is a bit of a goldmine for the genealogist, there being something in the region of 20,000 genealogical-related sites on the web. A good place to begin trawling the web for family information is the Family Heritage web site which can be accessed from within the package.

Paul Begg

### PCW Details

**Price** Standard version £19.99 (£17.01 ex VAT), Deluxe version £34.99 (£29.87 ex VAT)

**Contact** IMSI 0181 581 2000, [www.imsi.co.uk](http://www.imsi.co.uk)

**System Requirements** Windows 95

**Good Points** Fully-featured. Excellent printouts.

**Bad Points** The Deluxe version includes a lot of US-centric research material useless to most UK users, who nevertheless have to pay for it.

**Conclusion** It compares well with Broderbund's Family Tree Maker, although the latter is probably more firmly established. A good program, indeed.

★★★★★

## ■ Software

# Net.Medic Pro

Small but perfectly formed, is our diagnosis of this network-connection check-up utility.

**N**et.Medic Pro keeps a watchful eye on every stage of your network or internet connection, quickly and easily identifying problem areas and suggesting remedies. Installing from just two floppies and requiring no more than 2Mb hard-disk space, this tiny application is an invaluable tool for both network administrators and internet users.

It runs in the background with an icon in your system tray, so you probably won't realise Net.Medic is active. Launching its dashboard will open an information panel detailing throughput on the constituent parts of your connection. Traffic-light indicators report the status of anything from your modem to the destination server via internet routers, while the scrolling infobar at the top can be turned into a browser inlay to give you continuous updates without the need to have two applications open at once.

Contained in the application is Automonitor, which performs automatic connections to a user-defined list of destinations through either your LAN or your modem connection. Repeated automated tests in this way enable you to map the times of day you are likely to encounter



network congestion. Enter an email address, and it will also generate and send reports of critical problems. This allows system administrators to initiate an Automonitor session that will run in the background while the user continues to use their connection as normal. Any problems encountered will be logged and the system will effectively submit an automated service call. In this way, system administrators need not test troublesome individual connections and can even be in a location remote to the test machine.

Net.Medic Pro's Health Log keeps a list of

## Detecting and correcting connection glitches

every problem it encounters. Click on an entry on the list it maintains to read its diagnosis and a suggested remedy. Using this, we found that our 56K modem was running at a baud rate of just 38,400bps. Clicking on the AutoCure button changed our settings without us having to do anything ourselves, boosting the baud rate to 115,200bps and improving our performance up to four-fold.

Nik Rawlinson

## PCW Details

**Price** £411.25 (£350 ex VAT)

**Contact** Wick Hill 01483 562733  
[www.wickhill.com](http://www.wickhill.com)

**System Requirements** Windows 95, NT 4.0.

**Good Points** Automonitor and AutoCure functions do the hard work for you.

**Bad Points** None.

**Conclusion** Small and perfectly formed — essential for wired users.

★★★★★

# ErgoSentry

ErgoSentry issues regular warnings that you need a break from your PC or you risk RSI.

**A**s computers become ubiquitous in the workplace, more people are falling victim to repetitive strain injury (RSI). The most common form of RSI to affect office workers is carpal tunnel syndrome. Usually caused by typing too intensely or using a mouse for long periods of time without a break, this condition occurs when the tendons connecting the arm to the hand become swollen and pinch the nerves. It can cause extreme pain, and although surgery or medication can alleviate symptoms, this illness never goes completely.

ErgoSentry runs unobtrusively in the background to help prevent this condition. When the number of keystrokes or mouse movements reaches a certain level, ErgoSentry kicks in with a reminder to take a rest, stretch your arms and legs, or do some arm and wrist exercises. Users can adjust the settings if they are able to tolerate more or less activity than the default limits allow. A doctor's form is included to help you determine exactly what your best limits are, but unfortunately it isn't acknowledged that many doctors are still ignorant about the problem.



ErgoSentry measures the number of minutes you work and rest, and when your workload reaches a certain level, a warning pops up. When you reach the fifth warning level, you will be reminded more and more often that it is time to take a break. Because these warnings tend to occur when users are working more furiously than usual, a BusyAllowance timer is provided to give you a grace period before you stop.

The alerts were a helpful reminder for me to take a break but, obviously, they will help you

## Are you sitting comfortably? You should be, in aid of a healthy working environment

only if you act on them. Because I was busy, I told myself I would take a long break later and turned them off. ErgoSentry is worth a try, though, if you're willing to put in the effort to keeping healthy.

Susan Pederson

## PCW Details

**Price** £37.50 ex VAT for one to five licenses, £33 for five to 99 users

**Contact** QS Professionals 01525 382480  
[www.magnitude.com](http://www.magnitude.com)

**System Requirements** Windows 3.1, 95 or NT.

**Good Points** Gave me warnings when I was fatigued and didn't realise it. Forty adjustable settings let you personalise every aspect.

**Bad Points** Could take a while to find the right settings for you, and employers and doctors may not be sympathetic anyway.

**Conclusion** It can make a big difference, but only if you follow its advice.

★★★★★



# World Book 1998

Will this multimedia encyclopaedia cut the mustard as a bargain alternative?

IBM has in a very short space of time got itself quite a name for producing high-quality multimedia titles, mostly with good educational content. To compete with the dozen or so other multimedia encyclopaedias, Encarta not the least of them, IBM will have to pull something exceptional out of the hat.

Get hold of the World Book box and you could have any encyclopaedia. Like every other one it now comes on two CDs, with a third one to act as a study guide: so far, so ordinary. Load it up, and your heart does not leap at the sheer excitement of it. There is no multimedia presentation and no swirling graphics. Instead you see a simple screen outlining the various sections you can visit.

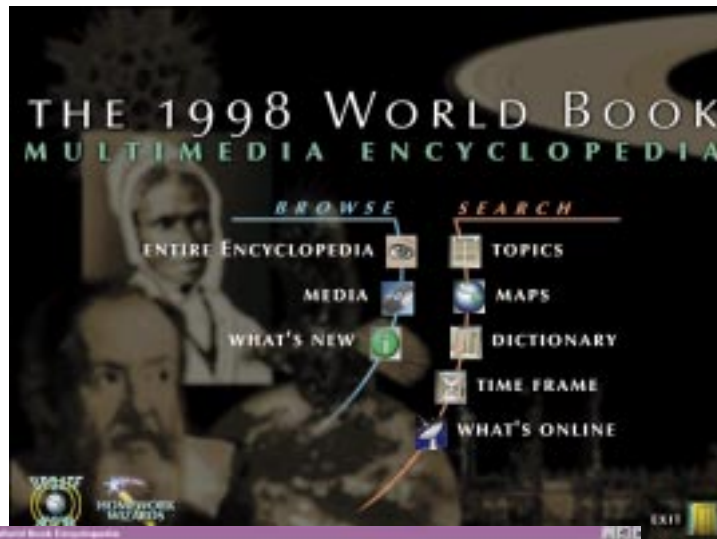
Start to go to a few articles and your first impressions are of a distinctly non-pictorial encyclopaedia. Many of the articles do not have pictures where you might expect them in other encyclopaedia, especially Encarta which seems to have a picture for almost every entry. However, some of the entries have plenty of pictures, such as the article on Australia which gets 20 maps and pictures.

The version of World Book we reviewed was the International English version, which has all the British spellings but is also aimed at the Australian and New Zealand markets so has a bias toward those countries as well as towards the UK. This comes out when looking up entries on music or film, where there are specific mention of Australian achievements where you might not expect them in an encyclopaedia aimed solely at the UK. Kylie Minogue manages to slip in by this route.

However, it is sufficiently UK-centric and up to date to list Tony Blair as PM and William Hague as leader of the opposition. The article on Blair is surprisingly detailed, giving a full biography and even presenting some of his policies, including the devolution of Scotland and Wales.

Gordon Brown, David Blunkett, Robin Cook get their own entries, as do John Major and, of course, Margaret Thatcher.

The quality of the articles themselves is good. They contain nearly as much information as Encarta, but are easier to assimilate as they are less consciously erudite. In other words, they give it to you straight instead of going round the



**Left** Pretty pictures, but not more than one per page

**Middle** You get the odd extract from great works, but the articles are patchy

**Below** Colourful timelines that do not necessarily follow a theme



The timelines are a little strange. You specify individual years and the pointers are then not to articles which reflect that particular timeline, but to articles which just have a mention of that date in their contents. This can be a little confusing, and does not help to unify world events and give them any coherence and sense, as a good timeline should.

The atlas is adequate, with some fairly detailed maps, but does not have as much information as you might wish for. Of course, to get a really good multimedia atlas you need to buy a specific CD atlas, rather than relying on an encyclopaedia's maps.

The World Book 1998 Multimedia Encyclopaedia is a good buy, especially for children of around ten years old who might be confused by Encarta. It is not as exciting as Encarta though, and does not have as much in the way of sound and video so is a little dry overall. Dull, but worthy.

Adele Dyer



houses. The number of articles on subjects is also good. There were numerous things I tried, expecting to be disappointed, and found it hard to find a subject not covered in one way or another. However, article summaries, as in Encarta, would have been useful on some of the very long entries. You can click on any word in the text and it will bring up a definition. This means every word, not just those with a hyperlink.

## PCW Details

Price £39.99

Contact IBM 0800 214887

[www.pc.ibm.com/us/multimedia/](http://www.pc.ibm.com/us/multimedia/)

System Requirements Windows 3.1, 95, NT 4.0.

★★★★★

## ■ Software

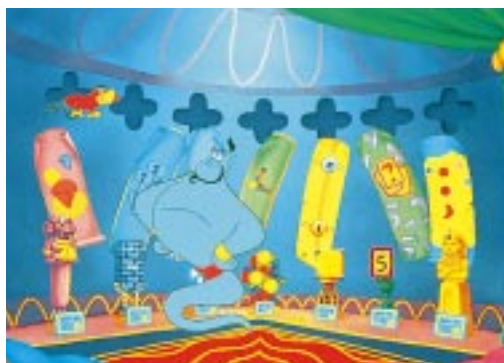
# Disney Maths Quest

A new format and price — what more could you want? The genie has been rubbing his lamp.

**D**isney has published one of its best CDs for years and dropped the price all in one go. Maths Quest with Aladdin is an educational adventure based on Disney's popular film. It features Robin Williams as the genie who guides you on your journey to save the town of Agrabah by completing 18 different activities.

You can play at three difficulty levels. Our testers, aged six and seven years old, had no problems sailing through the easiest level. As you progress through the game, you take an entertaining tour of Agrabah. In the market you may find yourself trading goods or completing symmetrical challenges to win back your companions; you need to solve addition and subtraction games to escape the town's dungeon, and the carnival tents in the desert host tests of logic. The graphics are excellent and as far from Ginn Maths books as you can imagine.

The maths challenges provide practice, rather than learning. The opening addition challenge, for instance, asks you to highlight two numbers to add on a wall of numbers and then click the correct answer. If you do not know the answer,



there is no help, no matter how many times you click incorrectly, nor are there any graphics to reinforce the concept of addition. But given that practice is such a big part of learning maths, the CD's claim to educational value is fair.

Our testers' favourite game was Square Up, a test of logic and strategy played in turn against the computer in which the winnings go to whoever places their marbles on the board in a complete square first. They soon realised that

they had only to replay their winning strategy and the computer responded with the same moves every time.

Disney has thoughtfully collected all the games that appear through the journey in the Genie's Rec Room. Having completed the adventure, you can then just select to play your favourite games and make a fortune from an afternoon spent playing Square Up against what our testers came to regard as a stupid computer that had nevertheless kept them amused.

Debbie Davies

## PCW Details

Price £29.99

Contact Disney Interactive 0181 222 1571  
[disney.co.uk/disneyinteractive](http://disney.co.uk/disneyinteractive)

System Requirements Windows 95, Mac.

★★★★★

# My Personal Tutor

Professor Presto — the unlikely mix of Bill Gates and Don King — helps out in this learning CD.

**M**icrosoft My Personal Tutor is the first educational software package designed to give a child individual instruction when and where they need it most, driven by Microsoft's TutorAssist technology. This means that whenever the child is making mistakes or seems to be getting stuck, a little cartoon character called Professor Presto, a mad-professor character with Bill Gates specs and Don King hair, pops up to help. He does more than just explain, and produces little exercises designed to point the child in the right direction.

There are at present two CDs in the series. The pre-school CD caters for three to five-year-olds and is based around reading, shapes, colours, spatial relationships and counting. The second CD is aimed at years one and two at school and concentrates on reading and arithmetic. They both follow the same basic pattern: the child logs on and, according to the progress they are making, the exercises become more or less difficult. As a record is kept of what each child has done, so they do not have to repeat any exercises. The child is not asked their age when they log on, so there is no way of getting a child to an advanced stage immediately. Parents can check how children are doing with



progress reports, showing what they have done and how well they did.

The exercises themselves are all fairly standard and, as you might expect, most of the characters in the games are drawn as bright cartoon animals. So in the pre-school workshop section Pablo the Parrot does colours and shapes with a colouring-in game, and Rory the Lion covers counting as you help him to make various toys. Complete enough of the exercises

and you get a reward in the shape of a toy. So there is nothing revolutionary here, just the usual learning games you find in many children's CDs. Just how unique this product actually is is open to debate. There are other CDs on the market that give parents or teachers reports on what the child has done, and even how well they have done. As to the grading of each child, just how well that works over a long period of time remains to be seen. However, it is still a good learning CD and great fun to play with.

Adele Dyer

## PCW Details

Price £29.99

Contact Microsoft 0345 002000  
[www.microsoft.com](http://www.microsoft.com)

System Requirements Windows 95 or NT.

★★★★★

# Fast Forms 2.0

On top form or reporting a fault? This program makes form creation or school reports a breeze.

When my wife, who's a teacher, asked me to computerise the school reports required for her special-needs pupils, I did not foresee much of a problem. After all, versatility is the name of the game for modern programs. So I figured that a word processor and a bit of lateral thinking should do the trick.

Wrong! Even Word 97 just doesn't have the necessary facilities built in, unless you write them yourself in Visual Basic for Apps, as is suggested. This route can be fun, especially for a computer enthusiast with time on their hands. But if time isn't freely available, it is better to buy a dedicated forms program.

After a bit of hunting around I found a package called Fast Forms from TopLevel, and decided to give it a try. In the words of the Paul Simon song, it's a one-trick pony; but the trick it does, it does it well.

Installation was a five-minute affair and, including the ready-to-use forms, the software only takes up 2Mb of hard-disk space. A full install with clipart and fonts would be around 40Mb. On firing up, Fast Forms presents you with two possibilities: you can either design a form, or fill in a form.

Over fifty ready-designed business forms are supplied, from absentee excuse memos to yearly expense summaries. These are sensibly laid out and will suit many businesses without any further tweaking. However, like me, you may have to reproduce existing items on screen. As with web pages, forms are best designed on paper and then implemented on-screen. One of the items that I needed to redesign was nine pages long, but Fast Forms did make the task quite easy.

After setting up your page size and margins, you are presented with a blank page and a floating toolbar. This has the five functions with which you define your form — box draw, line draw, text, field and group.

Text inserts the permanent text on to the form, for example "Insert Address Here". Field inserts a "live" area where information is to be filled in. Group joins boxes, lines and text areas together so they can be moved around the page while maintaining their relative layout.

Fields can contain simple maths functions as well as text, date and currency formatting, and can perform simple calculations on one another. Forms can therefore become easy to fill in, with



Fast Forms makes lighter work of school reports... well, for the teachers, that is

self-totalling expense sheets or invoices taking the drudgery out of routine work.

All aspects of boxes, lines, text and fields can be configured to taste, including colours. The final design is saved in the forms library. After a form has been filled in, it is by default saved in the forms library but with a different file extension to indicate a form entry rather than a form. This wasn't a comfortable practice for me, so I chose to set up separate folders for each category.

A caveat here: do not delete a form. Field entries are stored separately from the form and recombined for subsequent viewing or printing. If an original form is deleted, you will find that you can no longer view the entries.

Forms can contain pictures, although I can't see any reason for doing so. Those bundled with Fast Forms are the usual range of useful to cheesy pictures. I found the 100 fonts supplied far more useful. From Christmas snow-capped to oriental style, they are a handy bonus. While I certainly wouldn't use them on any forms, they have come in handy for use with my word-processing package.

My main crib with the program is that form design and form filling are too closely intermingled, just one mouse click apart. It would be better if the end-user could not access the design module. Similarly, opening and filing forms is unclear and could be improved.

Fast forms can be summed up as a cross between a basic word processor, a simple spreadsheet and an elementary design program. The sum is greater than the parts, however, and put together it does the job with confidence.

David Thorpe

## PCW Details

**Price** £29.95 (£25.49 ex VAT)

**Contact** TopLevel Computing 01453 753955  
[www.toplev.com](http://www.toplev.com)

**Good Points** Easy production of complex forms.

**Bad Points** Easy to confuse form design with filling.

**Conclusion** A professional tool for the price of a game.

★★★★★

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 a 600-word piece (plus two GIF-format screenshots for software reviews) 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](mailto:paul_trueman@vnu.co.uk)



## ■ Software

1 YEAR  
TEST

# Adobe Photoshop 4.0


 Personal  
Computer  
World  
Recommended

If money's no object or your system is power packed, this machine really is cream of the crop.

**W**hile the "My browser's bigger than yours" debate between Netscape and Explorer drones on, there has never really been any question as to who is king of the graphics-package jungle. Let's face it, Adobe Photoshop makes converting your loft into a studio, getting your nice white t-shirts all messy and dipping dismembered sheep in formaldehyde the sole responsibility of people called Tarquin and Poppy.

I have been using my copy of Adobe Photoshop 4.0 for just going on a year now. It is most often associated with professional work such as pre-press and DTP, but I don't fall into the professional-user category and I imagine that I'm not the only one. As more of a keen novice, the sort of graphic work that I use my computer for is a little less ambitious, such as cutting up stills from adverts and sticking silly moustaches on that Scully girl from the X Files. So, when it came to making a cool tape for a friend, I decided to use Photoshop to put together the track listing: grubby handwriting and attaching cuttings from magazines with Pritt Stick was a little too Blue Peter for my liking.

Adobe really hit paydirt with PhotoShop a couple of years back when it introduced the concept of layers to the image-manipulating masses. Layers are like a series of clear acetates which can provide endless levels of creativity as well as security. Each layer works independently of the others, allowing you to build upon or whittle away at your source image, safe in the knowledge that it's still intact at the bottom of the pile.

In my case I chose a picture I'd swiped off the net as my background layer before, throwing caution to the wind, I changed the colour balance, opted to push up the greens, and enhanced the cyan and blues a little. Extra layers were added for each block of text and as each layer can be worked on individually, alignment was a cinch. Once all the layers are in place, PhotoShop allows you to blend them, and I chose to reduce the opacity of the background picture in order to bring out the dark hue of the text and make it more readable.

If anything, the text function of PhotoShop is not best invested in. The text palette is blocky, and quite restricted in its number of functions. In addition, the interface doesn't allow for a great deal of text to be entered before enforcing a second line. Then again, text isn't really what PhotoShop is about, and you can get around this kind of thing quite easily.

The nice thing about PhotoShop is its ability to surprise and teach you new tricks a long time after you've ripped the cellophane off the packaging. The extensive number of filters incorporated make for a seemingly endless



Professional-looking tape covers are only one thing you can create with PhotoShop

number of possibilities for budding designers: simply open a picture, apply a filter (most have extra options within them too), then choose to undo and try another, or combine a number of filters. The effects can be good or bad, but the potential to learn and get creative is astounding.

However, PhotoShop is a powerhog, and it's

**"PhotoShop may not be the cheapest image editor in town, but it leaves the others standing"**

wise to ensure you have a fast and powerful machine before you hand over your hard-earned. It's best to plan your work in advance, and use low-resolution scans or artwork to experiment with before repeating on a higher resolution, and remember the limits of graphic files on the web, or whether you're printing out to a black-and-white printer. PhotoShop also allows for pre-designed and customisable action keys, thus cutting down on time and allowing for batch-processing files.

What's more, Adobe has incorporated an extra layer of adaptability beyond its own packaging. The plug-in feature allows for an endless number of extra filters and add-ons (available both on the net and to buy) to be seamlessly inserted, as well as image-sourcing

hardware such as digital cameras and scanners (though you can be sure they'll incorporate the kitchen sink at some point in the future for the completists among you). Adobe PhotoShop may not be the cheapest image editor in town, but it leaves the others standing. Oh, and the tape turned out nicely, too.

Adobe PhotoShop 5.0 is due out very soon. The latest version looks like it should address a few problems outlined in this review, especially the text feature. However, PhotoShop 4.0 and earlier versions are still immensely useful to the non-professional user, so it may be worth keeping an eye out for these in the bargain bins, classified sections and shops specialising in secondhand or discontinued computer-related stock.

Robert Venes

## PCW Details

**Price** £421.83 (£359 ex VAT)

**Contact** Adobe 0131 458 6842  
[www.adobe.com](http://www.adobe.com)

**Good Points** Incredible range of options, filters and layers.

**Bad Points** Can require a lot of memory and slow your machine to a crawl.

**Conclusion** If you've got the machine and the money, accept no substitute.

★★★★★

**1** YEAR  
TEST

## ■ Hardware

# Epson EPL-5500

**Smooth paper handling and good-quality output.**

**A**nasty nocturnal experience with a long print job and an ageing dot matrix printer convinced me to buy a brand-new laser printer. Various computer magazines had nice things to say about the EPL-5500. This, and my satisfaction with other Epson printers, prompted me to buy one.

The EPL-5500 is not a heavy-duty printer, so it's small. With everything folded up, it only occupies about 0.8 square feet. This does mean that the paper path is not straight, but, other than envelopes, nothing comes out looking like its been clumsily ironed. Installation was simple, and the manual is well thought-out. Best of all, it hasn't yet mutilated any sheets of paper.

The EPL-5500 can print at resolutions up to 600dpi and quality is good. Epson's toner cartridges, which have a life span of up to 3,000 pages, cost around £30, and fortunately the toner and drum are separate units.

The paper tray holds 150 pages. However, the piece of plastic that wedges the paper in place is less acceptable: it feels imprecise and

**The EPL-5500 is perfect for home use**

tends to move around. I also think the printer would benefit from more than two LEDs. Printing errors are communicated via a sequence of flashing lights, and having to refer constantly to the manual for translation is a pain.

Epson should also do a little more work on the EPL-5500's printer driver. It behaves in Windows 95 but in Windows 3.11 it mutilated my mouse-pointer and defaced the desktop; it even crashed the system a couple of times. "Toner-save mode" is pretty useless, too. More serious is the impact the driver has on the speed of the printer. You'll have to wait at least 35 seconds for page one to emerge, on top of a 30-second warm-up time, and I've had an extra megabyte of RAM fitted. The EPL-5500 comes with 1Mb fitted as standard. Epson's claim of 6ppm is reasonable once it has got going.

Richard Guy

**PCW** Details**Price** £321.95 (£274 ex VAT)**Contact** Epson 01442 261144[www.epson.co.uk](http://www.epson.co.uk)**Good Points** Takes up a small amount of space.**Bad Points** Drivers could be better. Print speed could be faster.**Conclusion** Excellent choice for home users.

★★★★★

**3** YEAR  
TEST

# Logitech MouseMan Sensa

**The MouseMan is not half-man half-rodent. It's a reliable and comfortable desktop alternative.**

**A**bout three years ago I decided that the cheap mouse I had must go. Just at an interesting or important time, it would decide to clog up. No matter how delicately or erratically you moved the thing, you couldn't get the pointer to move to the right place on the screen. It meant that most weekends I found myself cleaning the inside of the damn thing, only to find myself doing it again the following week. As the weeks build up into months, you soon get fed up. There was only one

thing for it: time to buy a new mouse. The old mouse had come with my PC, and at the time



The latest Mouseman from Logitech

of purchase, checking out the quality of the bundled mouse had been the last thing to cross my mind. Silly really, when you think about how much time you spend using it. This time round I decided that I would invest some time and effort into getting a good-quality mouse that would be comfortable to use, and hopefully wouldn't need so much cleaning.

Browsing through some high-street stores, I tried out a number of mice, although I was going to buy via mail order because it was much cheaper. By the end of that day I decided I wanted the top-of-the-range corded mouse from Logitech, the MouseMan Sensa. All I needed to do now, was to decide the colour and texture. Aren't these such trying times!

The Mouseman Sensa came in "Blue Leopard", "Silver Pearl", "Deep Wood" or "Black Chess". The last two had a brilliant lacquered finish, while the other two had a soft matt finish. I loved the "Deep Wood" colour, but not the lacquering: after some time using it, I found the lacquering to be just a little slippery. My second choice, and the one I decided to buy, was the "Silver Pearl" colour with the soft matt finish which felt almost leathery to touch. For something the

size of the palm of my hand, I forked out £51.70 including VAT and delivery. And I don't care how mad you think that might be. After three years of quite hard and continuous use, I still have a mouse with three fully programmable buttons, plug-and-play compatibility, nice leathery texture and a comfortable shape that your hand can wrap around. To this day I still haven't found a mouse more comfortable, and what's more, I haven't cleaned it yet.

Glenn Turner

**PCW** Details**Price** Product is discontinued. Alternatives: MouseMan+, £39.99 (£34.03 ex VAT); Mouseman 96, £28.20 (£24 ex VAT); Pilot Mouse, £17.63 (£15 ex VAT)**Contact** Logitech 01306 734300[www.logitech.com](http://www.logitech.com)**Good Points** Comfortable to use. Texture. Low maintenance.**Bad Points** Expensive.**Conclusion** Comfortable, long-lasting mouse.

★★★★★



# Movie magic

Having worked in digital film processing, Neil Harris started Sohonet, a technology which networks post-production houses in London with Hollywood studios so that rushes of films can be seen almost immediately.

**C**huck a brick in the air anywhere around London's Soho and, likely as not, it will come down and hit someone who works in the digital film or video post-production industry. This is because Soho has the densest concentration of such companies in Europe. Give that same brick a little tail-spin, and it might get as far as hitting Neil Harris, managing director of Sohonet, a company that specialises in networking all these companies not just to each other, but to Hollywood and beyond.

But let's go back a bit. In days of yore, if you wanted to show King Kong climbing up a skyscraper but you didn't happen to be friends with a 150-foot high gorilla, it was necessary to fake things by using a latex model and a technique called "travelling matté". Here, the live action and King Kong would be shot on two separate pieces of film and married together in an optical printer. These days, however, all such marvels of illusion, from creating giant insects in *Starship Troopers* through to giving Leonardo diCaprio sex appeal, are done on a computer. Many suppose that these techniques were developed in the USA. Not so.

#### And the winner is...

"After studying mathematics and physics at Cambridge, I found myself, almost by accident, working on the graphics on Channel 4 News," said Neil Harris. "Using the skills I learnt there, I went on to become an independent consultant to companies in the film and video industry. Then a group of friends and I had an idea: why not apply the same sort of graphic-manipulation techniques to film?"

"At the time, 12 years ago, no-one had really thought about doing digital film processing. So we sketched out our plans on someone's kitchen table and founded the Computer Film Company, which set the ball in motion for the whole industry. Two years ago, two companies were honoured with having created digital film technology: George Lucas's Industrial Light and Magic, and ourselves in the Computer Film Company. As a result, we received a technical Academy Award."

In order to be able to do digital post-production on a film, you first have to digitise it. This is done via an

elaborate teleciné device that scans each frame and then writes the data to tape or disk. Typically, a single frame of 35mm film bloats up to 50 megabytes. And as there are 24 to a second, and some 5,400 seconds in a standard feature, that adds up to quite a lot of floppy disks.

As Neil Harris explained: "What people ended up with was film images stored at very high resolution that couldn't be moved using traditional video standards. So what they did was buy the fastest data network they could afford, maybe 1,800 megabits per second, to link the various computers internally within their own business. Which was fine if the film stayed within the confines of that business. But what happened if they wanted to send it to a post-production house down the road? They had to write it to tape, put the tape in a plastic bag and then bike it to its destination, where it would have to be read from the tape into the computer. All of which could take quite some time."

So why not come to an agreement with that post-production house and string a dedicated high-speed link between the two? "Because post-production houses are traditionally highly competitive. Even if two such competing companies were to come to some sort of agreement to work together on a single project, a dedicated link between the two would still make little sense. For a start, it would be difficult to get the link set up in time. Even if you did, at the end of the job, you might not want to carry on collaborating with those people, but you'd be left attached to them by an expensive, redundant length of cable."

#### Competition and co-operation

So three years ago, Neil Harris and his colleagues started to have words in receptive ears. Wouldn't some sort of permanent network linking the post-production houses be better?

"Everyone knows everyone else in the business. And while they're all fiercely competitive commercially, there's always been a history of co-operating at the engineering level. For instance, if something in your teleciné breaks down, your rival down the road will always lend you a spare part because they know that when theirs goes wrong, you'll do the same for them. So we basically





started off with our engineers being in the same Soho pubs with other production houses' engineers after work. Or in some cases, during work. They got talking."

The result of their talking was that the engineers agreed among themselves that having a common network would be a good idea. Which was great. But then they had to sell this concept to the men at the top who didn't drink in the pubs but who ate in expensive restaurants and who signed their pay cheques.

"The strange thing was how little effort it took to persuade them, because the idea of networking the post-production houses was such an obvious one. And not just technically. By networking them all together, you create, in effect, a united block of post-production houses which has much more negotiating power when it

comes to dealing with the big players in the film world."

So in December 1995, Sohonet was established to co-ordinate the consortium of companies that would build the network. Then roads and pavements all around Soho were dug up and fibre-optic cable laid. By April 1996, the network was up and running, zapping bits and bytes around at 155 megabits per second over the bee's knees carrier access technology, Asynchronous Transfer Mode [ATM; see page 114], all controlled by an assortment of Silicon Graphics hardware and custom-built, dedicated processors. Now, instead of biking film clips from place to place, you simply drag and drop, like transferring files between disks on a PC. Clients pay a flat fee, just like an ISP — except more expensive, of course.

"At the highest speed, it takes 15 minutes to transfer

p114 >

**A big hit in Hollywood:** Neil Harris's Sohonet has played its part in top films like *The English Patient* and *Lost in Space*

one minute of 35mm film across the network. This may sound slightly onerous, but bear in mind that it may then take five days to actually do all the special effects on that one minute of film, so from the point of view of those sorts of time constraints, it isn't that bad. But in any case, in the very near future, we're going to speed up the network to 622 megabits per second, which will start to allow us to move stuff around considerably faster."

These days, Sohonet doesn't just link Soho post-production houses together; it also links directly to the major Hollywood studios. So, effectively, Hollywood is no longer just a suburb of Los Angeles but, with the mere click of a mouse, anywhere that can plug into Neil Harris's network. A film can be shot in London and its rushes previewed the same evening — or morning, as it would be West Coast time — in America. This has already happened with major films such as *The English Patient* and the soon-to-be-released *Lost in Space*. In fact, thanks to this technology, there's no actual necessity for the director to be in the same country in which the film is being shot. He could, for instance, simply view the video assist pictures (the video images that are shot concurrently with the film) as they come off the

camera and co-ordinate scenes with actors and technicians using videoconferencing. But having got this far down the road, what of the future?

"It's easier to look ten years ahead than, say, five. I can see that in the future, cinemas will no longer have to take delivery of cans of film. The studios will simply send

features to them over the line, saving thousands in negative costs. I think, too, that the technology around which Sohonet is based is blazing the trail for the sort of technology that the

**"... the technology around which Sohonet is based is blazing the trail for the sort of technology that the consumer will eventually be using"**

consumer will eventually be using. For instance, I believe it will be the model for delivering broad-band internet to the home. And things like digital television will go down the internet route. People will get everything down that one point — file deliveries, TV programming, telephony, and so forth. So it's not so much the media industry that's going to have the big shake-up, as the telecommunications industry."

Harris concluded: "Currently, we're probably two years ahead of the curve, but we intend to remain two years ahead. We intend to widen our network out, increase our bandwidth, and ride on the back of the tidal wave of bandwidth that's about to hit the world. It's a very exciting time to be in the business." ■

## What is ATM?

**D**ifferent types of data traffic place different requirements on the networks that carry them. Standard telephone voice communications, for example, are fairly tolerant of data loss and other such distortions on the line, but don't take kindly to long delays or pauses. (This is especially so with 0898 numbers.)

Transfer of computer files, on the other hand, requires all the data to travel down the line, in sequence. Line noise and other types of interruption will abort the transfer. However, as internet users are all too aware, data transfer can tolerate huge amounts of delay.

So, in order to accommodate the vagaries of the different types of data, specific networks have been established to handle specific kinds of traffic. Ethernet for LANs, for instance, Frame Relay for Wide Area Network data transfer, and leased lines — Kilostream or Megastream — for broadcast-quality audio and video. Which leads to a lot of "spaghetti" wiring and lots of pavements being continually dug up. Ideally, then, what the world really needs is a single network that can accommodate

different types of data traffic.

Fortunately, the world has now got it: it's called Asynchronous Transfer Mode (ATM).

ATM works by filling small, fixed-size "packets" with data. When these packets have been filled, they're transmitted to their final destination. Because the packets are so small and travel so quickly, they can cope with lots of different types of data, including voice telephony, video, and computer information. The packets' exact route is determined beforehand by the customer.

So, for instance, a post-production house in Soho can tell the data to go all the way to Hollywood, but stop off at Warner Bros on Wardour Street on the way. Or they can simply say go directly from A to B, do not pass Go, do not collect £100. Because the route is pre-determined, ATM is known as a connection-orientated service. This "virtual circuit" is held open only for the duration of the transfer. Once all the data has been sent, it's dropped, like putting the receiver down after a dial-up phone call.

Where ATM particularly scores over

other types of network is in its ability to allow network resources to be shared by several other users. Many sorts of data communications — a telephone call, for example — go in fits and starts. That is to say, there's talking, but there's also a high percentage of silence. The trouble is, you can't suddenly step the bandwidth down when there's a pause in the conversation. So effectively, during these pauses, you're wasting that bandwidth.

With ATM, however, while one user is hanging around not saying anything or not sending a high amount of data, another user's data packets can be routed down his or her temporarily under-used path, thus improving the utilisation of available bandwidth. In addition, users can specify beforehand exactly how much bandwidth they'll require, and pay accordingly.

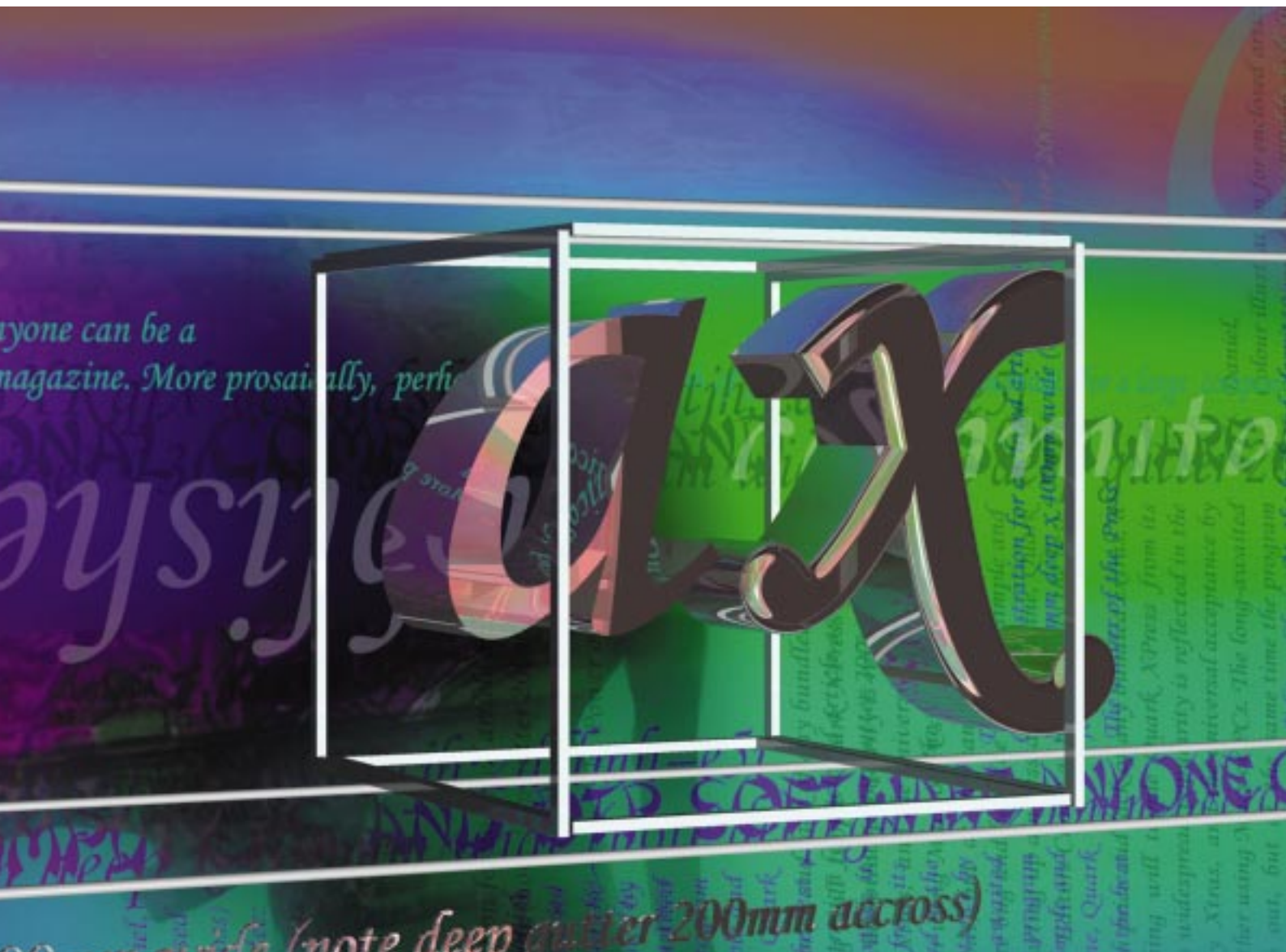
Because of its flexibility and high speed, ATM is being mooted by the big players such as Microsoft as the network technology for the delivery of high-band internet, video on demand, and other such high-volume domestic data-delivery services. We shall see.



# Freedom of the press

Never mind the press barons: now, with just a personal computer and some DTP software, anyone can be a publisher. Tim Nott reviews both ends of the market, from £34 to £1,500. Here is something for everyone.





**P**erhaps you want to launch a new, glossy, lifestyle magazine? Or perhaps you have the job of producing technical manuals for a large company? Maybe you want to produce a catalogue or promotional material for your business, or you might be in charge of editing a newsletter for a school or sports club? In any event, what you need is some DTP software and here's the best that money can buy.

Arguably, there's a lot you can do with current state-of-the-art word processors, most of which come with drawing tools, special text effects and support for newspaper-style columns. But for serious work, there are some DTP essentials you won't find in a word processor. For publications that are going to be printed commercially, in colour, you'll need the facility to create separations, preferably with

automatic trapping. If you're juggling lots of different stories, linked frames are essential. For creative page layout you'll need much tighter positioning control than a word processor can offer, and the facility to bend, fill and rotate text in various ways. For high-quality typesetting, you'll need precise control over spacing and hyphenation to achieve good text colour without loose lines or "rivers". Finally, you'll need experience. At the low end of the market, particularly, you will find that a specialist DTP application will offer help in the shape of wizards and templates to get you going on a project.

We've split our reviews into two parts: with the top-end products first (pp120-125) followed by lower-cost applications (pp130-136); prices range from under £40 to over £1,300 (ex VAT). Finally, if the DTP-speak in this introduction has you reeling, we've included a jargon-busting glossary (p127).

### DTP software Contents

- 120 Adobe FrameMaker 5.5.3
- 121 Adobe PageMaker 6.52
- 123 Corel Ventura 8 (beta)
- 125 Quark XPress 4.0
- 127 Electronic publishing
- 127 Glossary
- 130 Microsoft Publisher 98
- 132 Serif PagePlus 5
- 136 GSP PressWorks 2.5
- 136 ipublish 2.0
- 138 **Editor's Choice**
- 139 Table of features

### Ratings

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

p120 >

## Adobe FrameMaker 5.5.3

You might think it unusual for one company to offer two high-end DTP products in apparent competition with each other. But, like PageMaker, FrameMaker was not developed in-house; it was acquired. Frame Technology developed this not just as a DTP application but as a corporate-wide "document creation solution" with the emphasis on electronic output. It's available on Mac and Unix platforms as well as Windows and although we only have a .5.3 increase since the last version, this is a true 32-bit, Windows 95 or NT application.

Even its best friends would acknowledge FrameMaker's interface as idiosyncratic. Start it up the first time and you are presented with three seemingly independent Windows: an empty FrameMaker interface, a console reporting font substitution, and a free-standing document window containing a non-editable overview.

The help files are also free-standing FrameMaker documents that eschew the standard Windows Help engine and conventions such as resizable windows. Once you've got over this initial strangeness, it makes more sense, with familiar concepts such as paragraph and character styles, master pages and templates. Each child document window has its own set of controls, leading to the character and paragraph style catalogues for that document, a set of navigation controls and, rather oddly, buttons to activate the global drawing and equation editing toolbars. Other features are decidedly odd, too. There is no font list box: you'll have to go through the menus or set up a style, although admittedly the latter path makes for good DTP practice.

This version at last brings us tool tips, which help with all those unfamiliar buttons. Other interface enhancements include drag-and-drop of graphics between documents and right mouse button context menus.

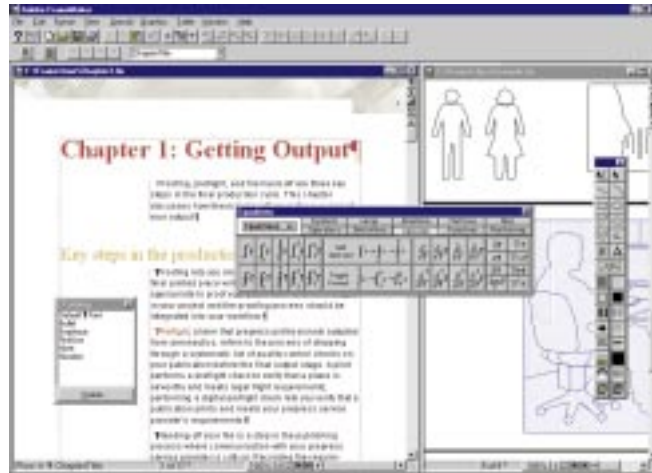
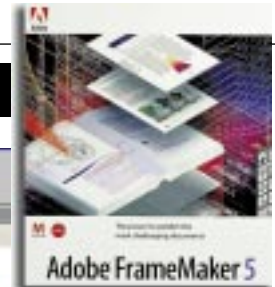
### Never mind the eccentric interface...

Despite the eccentric interface there are some powerful tools and features. The drawing toolbar features Bézier curves and polygons although you can't have non-rectangular text or graphic frames. The Equation editing palette contains a huge range of symbols, operators, delimiters and other mathematical furniture and is almost like a separate application. Colour support has been improved with 12 industry-standard libraries (and the facility to add more) and one-percent-step tinting. There is a new trapping feature, but this, like the imposition of multi-page layouts, is only available on the Mac version.

Document management has always been FrameMaker's strongest point, with electronic cross-referencing, support for multiple authoring, revision tracking, complex indexing and, its star turn, conditional text. The latter has been much-vaunted by its developers as a way of producing multiple versions of the same document — instruction manuals, say, in different languages or for different products in the same range. However, there's been much catching up by the competition and both PageMaker and Ventura now also offer ways of implementing this feature. There have been some improvements to tables in this version, with sorting, straddled columns and rotated text and on the typographical front you can stretch or expand text, either by a percentage amount or by dragging on bounding boxes.

### Save to Acrobat

Although FrameMaker pioneered electronic document publishing, it did so in its own idiosyncratic way, with a proprietary format that needed the full product installed in order to read the files on another computer. In the light of competition from Acrobat, Envoy or HTML, this makes the Frame format distinctly unattractive. Although there is now a standalone viewer available, it is not free. Version 5 added some limited HTML support but 5.5 gets more into the mainstream with a Save As... HTML that converts (where possible) Frame's "own-brand" hypertext links to standard URLs and all graphics to the GIF, JPEG or PNG file formats.



Above Conditional text enables variations in the same basic document  
Left Maths is very much FrameMaker's favourite subject

You can save directly to Acrobat format — producing PDF files directly (in previous versions you needed Acrobat

Distiller to process the Acrobat-ready files produced by FrameMaker).

This time, there are two variants: plain and FrameMaker+SGML. The latter is designed for sites where large documents need to be frequently and extensively updated. It offers support for the Standard Generalised Markup Language, including automated entity management, import of SGML fragments as well as support for Japanese double-byte characters.

As well as spelling and hyphenation dictionaries for 17 European languages, there is substantial support for the Japanese language and typesetting in both plain and +SGML versions. Finally, as with PageMaker, there are copies of Adobe Type Manager, Acrobat reader and 220 Type 1 fonts. Again, as with PageMaker, you need to register the product in order to get a password to unlock these fonts from the Type-on-Call CD-ROM. In addition, there is a CD-ROM showcase, which features samples of third-party add-ons and vertical solutions, should you be in need of inspiration.

## PCW Details

**Price** Average street price £517 (£440 ex VAT)

**Contact** Adobe 0181 606 4001  
[www.adobe.com](http://www.adobe.com)

**System Requirements** Windows 95, NT 4.0, Mac, Unix.

**Good Points** Strong on electronic documentation with multiple platform support.

**Bad Points** Eccentric interface and documentation. Proprietary file formats.

**Conclusion** Despite some updating by Adobe, this remains an uncompetitive and out-on-a-limb product.

★★★★★



## Adobe PageMaker 6.52

There's been little change here from last year's group review: the .02 version increment is a maintenance release and is freely available to 6.5 users from the Adobe web site. Despite the fact this is the only one of the four high-end products here, not to see an upgrade since our last group test in May 1997, PageMaker is still looking good.

Aldus (as it was) PageMaker was one of the founder members of DTP, both on Macintosh and on early versions of Windows, but spent several years languishing in Quark's shadow. Although it gradually caught up with things such as free rotation and third-party add-ons, it wasn't until after Aldus was subsumed by Adobe that it really started to fight back. The latter, with its industry-standard expertise in PostScript and Type 1 fonts, as well as its leadership in the image-processing market was well placed to give PageMaker a much-needed makeover. The first Adobe release (6.0) brought the long-awaited multiple master pages, HTML output and a number of changes (such as renaming the Xtras add-ons as Plug-ins), that were designed to bring PageMaker into line with the Adobe look and feel.

One perennial criticism of PageMaker was the interface, with its labyrinthine dialog boxes, and poorly-designed menus. This is now a thing of the past and the Adobification, started in version 6.0, has been substantially built upon in 6.5. The Control Palette added in version 5 as a counterpart to Quark's Measurements Palette, has seen some streamlining, and the previously under-used right mouse button has at last found context-sensitive employment.

As with Quark there is still, strangely, no standard Windows button bar but the most dramatic interface enhancement is the introduction of Photoshop-style stacking palettes. These are an excellent compromise between keeping essential tools to hand, such as colour swatches, styles, master pages and hyperlinks, while having as little on-screen clutter as possible. When the palettes are stacked, they form a neat, tabbed combination, much like a standard Windows 95 tabbed dialog, only these are modeless (i.e. can be kept open all the time) and individual pages can be floated off the stack to stand alone, if that's more convenient.

The main tool bar is, if anything, even more simple than Quark's. There are tools for selecting objects, editing text, zooming, panning, cropping, line drawing and rotation. New in this version are three frame tools that correspond to the rectangle, ellipse and polygon shape tools. Like Quark's boxes, these serve as containers but can hold either text or graphics. Pictures imported into a frame are cropped to the frame's shape but blocks of text are shaped accordingly, like a text wrap in reverse. Imported bitmaps can also have Photoshop-standard Plug-in filters applied in place without the necessity of loading a separate image-editing program.

### Hyperlinks and layers

Observant readers will have spotted the earlier reference to a hyperlink palette, and this version expands considerably on the electronic publishing features seen in 6.0. You can now import and export direct to HTML, with automatic conversion of bitmaps to jpeg or gif format and preservation of multiple column layouts. There's a copy of Acrobat Distiller included with the package, but PageMaker also has the option to export directly to .PDF format, for instant creation of Acrobat files.

On the document management side, there is the story editor (a built-in word processor for editing and proofing text in non-WYSIWYG mode) and the updated, but still rather lacklustre, table editor. A potentially great labour-saver is the auto-reformat tool. If, for example, you decide to change the page size of a document globally, PageMaker will attempt a "smart" resizing of graphics and reflowing of text to suit.

Another brand-new feature is that of Layers. This started off in drafting software as a means of grouping related items and switching



Personal Computer World  
Highly Commended

Above PageMaker's tabbed palettes save on screen space

Right Multiple master pages make for easy layout control



them on and off. For example, on a building plan you could have separate layers for the foundations, drains, walls, carpentry and so on, and print out just the relevant layers for the individual trades. The concept has since spread to illustration and image-processing software but this is its first appearance in DTP. Its principal attraction here is for including multiple versions of a document, say, in different languages, in the same file, or for having a non-printing comments layer for workgroups.

As well as being cheaper than XPress, there's more on offer, including a lightweight version of Photoshop and 17 proofing languages (but unlike Passport,

no additional interface or helpfile languages). There's an impressive and inspiring set of online tours and tutorials on the CD, ODBC drivers, a copy of Adobe Type Manager and, on registration, a key to unlock 220 typefaces from the Type On Call CD-ROM supplied in the box.

### PCW Details

**Price** Average retail price £495.85 (£422 ex VAT)

**Contact** Adobe Systems 0181 606 4001

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

**System Requirements** Win95, NT 4.0, Mac.

**Good Points** Greatly improved interface, layers and HTML output.

**Bad Points** Poor tabling. Plug-ins not as plentiful as Quark Xtensions.

**Conclusion** Not the pro's number one, but tries a lot harder.

★★★★★



## Corel Ventura 8

**BETA**

**A**nother product with a chequered history of ownership, Ventura was the first PC-specific DTP application, originally running on the GEM interface before making the transition to Windows. The Corel Corporation acquired the product in 1993.

Unlike its pioneering rival, PageMaker, which took a pasteboard approach with the emphasis on page design, Ventura concentrated on frames and long, complex documents; manuals rather than magazines. It also acquired something of a reputation for complexity and user-hostility. Since its acquisition, Corel has endeavoured to change this, and version 7, although still complex, was a lot more comprehensible. Although sporting a rather terrifying array of toolbars, most of these, such as the outline, fill and navigation bars, were fairly self-evident.

In version 8, Corel continues its attempt to bring Ventura further into the fold with Dockers, first seen in CorelDRAW 8.

Both the Navigator and the Tag Window are dockable, which means they can float free on-screen or be docked neatly into place beside the main work area. The selling point of Dockers is that they are never in the way, as the work area automatically zooms to accommodate them. In practice, in the beta we found it could be awkward getting these to dock in an economical way, with screen area being a most precious resource in DTP, and it can be a time-consuming business getting these just right.

It is, however, worth persevering as these two windows provide the key to document management. The Navigator shows a tree-like overview of the document, branching into chapters, which in turn branch into individual text and graphic files.

### Let's play Tag

The Tag Window is rather more complex. Tags have always been one of Ventura's selling points, and these encompass Page tags (known elsewhere as master pages) and Paragraph or Character tags (known elsewhere as styles). Graphic elements, such as Rules and Frames, can also have tags defining their default size, shape and colours. Text and graphics can be formatted simply by dragging an appropriate tag on to them, and tags can also be dragged between documents. An unusual, but potentially useful tag is the Conditional one: rather like PageMaker's layers, or FrameMaker's conditional text, this lets you create multiple versions within the same document. Another clever touch is that you can now search for one thing but replace another: like finding all instances of a text string and modifying the tag of the paragraphs containing them.

Customisability is a strong point: the Tag Window can be customised to show user-defined properties, context menus can be edited, and entire working environments can be saved as a Workspace. Optionally, this last feature can be integrated into the Windows 95 User Profiles, so different users, or the same user working on different projects, can automatically start with the appropriate workspace options.

Despite a sometimes bewildering array of buttons, there are some smart touches, such as smart "mode" changing: click on some text and you'll automatically switch to the editing tool. There is also a Property bar which changes to suit the job in hand, in a similar fashion to XPress' Measurements Palette or PageMaker's Control Palette. One clever touch with this is that it provides an on-the-fly spelling check and thesaurus. A fully-fledged text editor is also available, as is an admirably-equipped table editor.



**Above** Plenty of customisation options for creating multiple bespoke workspaces

**Left** What's up, dock? Ventura's Tag and Navigator Windows slot into place

As you would expect from Corel, the drawing tools are impressive with a good range of smart shapes and irregular text containers, and the legendary range of Corel fills including fractally-generated bitmap patterns. As with XPress, you can convert Artistic (unframed) text to curves,

then node-edit the shape and give it special fill effects.

Version 7 embraced electronic publishing whole-heartedly, and 8 goes further. The Publish to HTML dialog now sports a Frame tab for creating HTML frames. Equations are now automatically converted to bitmaps and there is image map support for imported pictures. HTML indexing has been improved to cover all, not just the first, instances of entries in a document and, as before, Corel Barista provides a path to Java-enhanced web publishing. Corel, however, seems to have pulled the plug on its own-brand alternative to Adobe Acrobat, as we could find no trace of the Envoy portable document system on the beta CD.

Despite that omission, the package exhibits the customary Corel largesse with 25 languages (and variants thereon) for spellchecking, copies of PhotoPaint, Database Publisher and WordPerfect included, various scripting, scanning, bitmap-to-vector conversion and optical character recognition tools, over 1,000 fonts in both TrueType and Type 1 format, a font navigator and a 40,000-piece clipart library. Installation will cost you somewhere between 80 to 250Mb, but since the price is less than half that of last year's model, you'll get ample change for a new hard disk.

### PCW Details

**Price** £374.83 (£319 ex VAT). Various upgrades available including loyalty deals for Corel customers.

**Contact** Corel 0800 973189 [www.corel.com](http://www.corel.com)

**System Requirements** Windows 95, NT (Alpha and Intel platforms).

**Good Points** An extremely highly-featured product brimming with extras.

**Bad Points** Still complex and rather intimidating for new users.

**Conclusion** Offers the most for the money at high-level publishing.

★★★★★

## Quark XPress 4.0 Passport

**A**lthough Quark XPress first saw the light of day in 1987, somewhat later than Ventura or PageMaker, it very soon captured the hearts and minds of the publishing industry. Today, according to its developers, it has 90 percent of the magazine publishing market.

XPress was originally developed for the Mac and it wasn't until 1992 that a PC version appeared. During the next five years little changed, apart from some essential fixes such as Mac/PC file compatibility. Hence, despite its strong market share, XPress was starting to look outflanked by the competition in terms of features.

Version 4, which appeared late last year seeks to rectify this with 75 new features. This new 32-bit version comes in two flavours, Regular and Passport. The former comes with US- and UK-English proofing. Passport adds nine more European languages, not just for spelling and hyphenation, but right through the interface and help files. The bad news is that Passport is not only considerably more expensive, but is dongle-protected.

Four key features have helped the XPress success story. First is the phenomenal typographic precision, with placement accuracy down to one-thousandth of a millimetre. Second is the flexibility, with features such as multiple master pages and free text rotation that appeared long before the opposition. Third is the open-architecture approach, with the Xtensions platform giving third-party developers the facility to produce additional features, hardware support and solutions for vertical markets. Finally, Quark managed all this with a brilliantly simple interface, with most formatting and fine tuning being done from a modeless Measurements Palette.

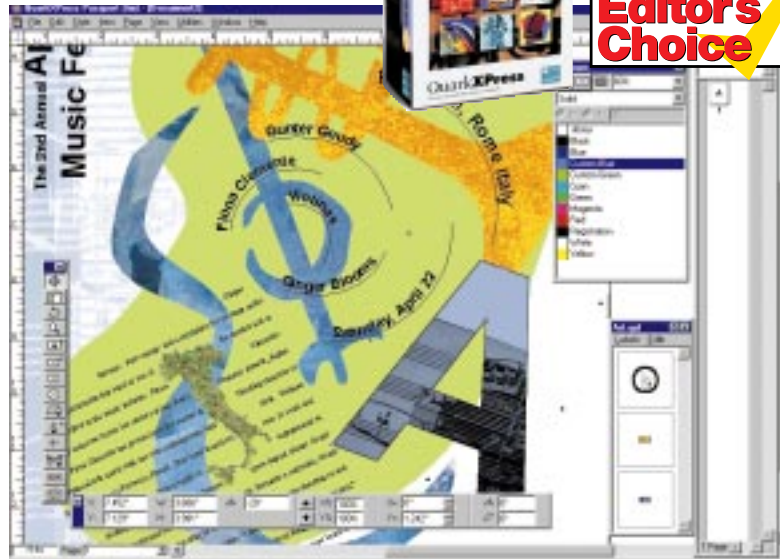
So what, apart from the gift of tongues, is new? The interface is largely unchanged, with a slightly expanded tool palette, and new palettes for Lists and Indexes (to which we will return). Although devoted XPress users will appreciate the minimal impact on the traditionally simple interface, others might miss the standard shortcut toolbar for saving, opening, clipboarding and so on which appears in practically every other Windows application.

### Curvaceous creativity

Turning to that "slightly" expanded tool palette, there's a lot more than meets the eye, and the buzzword is Bézier. XPress users will be familiar with the concept of Boxes (containers for text, graphics or colour fills that, despite their name, can be polygonal or elliptical). These have been joined by Bézier boxes that can also contain graphics and text or exist as drawing objects in their own right.

You can create free-range curves, either by freehand dragging or point by point, and a corresponding set of line tools lets you create straight or curved text paths. When you finish creating the curve (by double-clicking), a text cursor automatically appears at the start, ready to type. Another feature, usually only seen in purpose-built drawing software is the facility to convert text to shapes, or Boxes (in Quark-speak). Having done this, individual letters behave just like drawing objects. You can node-edit the shapes, fill them with bitmapped patterns and perform Boolean operations such as welding two letters together or using one letter to cut-out from another. All of which makes for some wonderful possibilities for logo design. There's also an option to keep a converted letter in line with the surrounding regular text, so you could create the electronic equivalent of an illuminated document.

XPress has always leant towards page layout rather than document management, but this version rectifies the bias somewhat. A Book can now define a collection of XPress documents which can all take their default Styles and other attributes from a Master Chapter, rather like a level up from Master pages. Page numbering is synchronised



**Above** Letters can be converted to shapes, node-edited and filled with bitmaps

**Left** Libraries store text and graphics for re-use

throughout a Book, and there is semi-automatic indexing.

The Lists feature is simple but ingenious: it lets you reproduce all the text, formatted in a named style, anywhere in the document or

Book as a list complete with (optional) page numbers. So, provided you've been disciplined in your use of styles, this makes it simple to extract tables of contents (with up to eight stacked levels) and lists of diagrams, tables, or illustrations. Styles can now be saved and applied on a character, as well as on a paragraph basis, making it much easier to apply in-line headings or highlight keywords. Colour support sees some upgrades: the proprietary EFI colour correction system is replaced by industry-standard ICC (International Colour Consortium) and Xpress now supports HiFi colour and will produce six-colour process separations as well as the usual four.

On the negative side, the lack of a standard toolbar is aggravated by the poor use of context (right-mouse) menus. Those looking for a one-stop publishing solution are going to be disappointed by the lack of HTML or indeed any electronic output.

Although this is a highly professional product, it must be said that the pricing is astronomical. Although you'll pay a lot less than the "recommended" price if you shop around, this doesn't include any fonts, clipart or other resources.

### PCW Details

**Price** (Recommended) Passport £1,551 (£1,320 ex VAT); English £1,169.13 (£995 ex VAT)

**Contact** Quark Systems 01483 454397  
[www.quark.com](http://www.quark.com)

**System Requirements** Window 95, NT, Mac.

**Good Points** Available on both Mac and PC, with new drawing tools and multilingual support in Passport.

**Bad Points** Expensive. No fonts. Few extras. No web publishing.

**Conclusion** Overall an excellent update, but the competition tries much harder in terms of value and versatility.

★★★★★

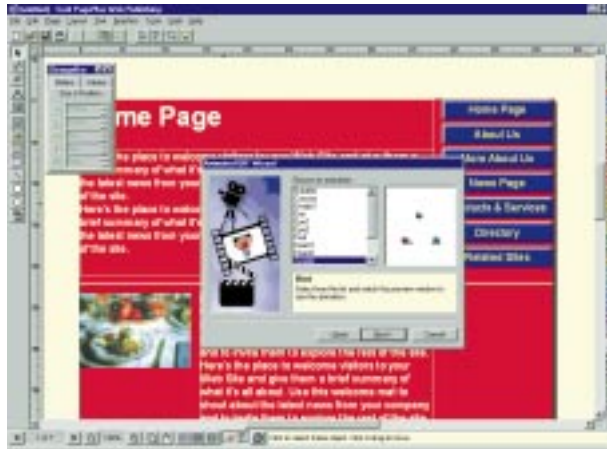


## Electronic publishing

**E**lectronic publishing falls broadly into two categories. The first, portable documents such as Acrobat files, are primarily designed as enhanced versions of paper publications, with the added value of searching and hyperlinks. However, most of these are produced as a by-product of printed output, such as the manuals-on-CD which come with software products, or with our very own *Hands On* back issues on the PCW CD-ROM. The whole point of Acrobat is that the document appears the same — and can be printed — on any hardware that can run the (free) Acrobat reader. If you need to produce Acrobat files you'll have to buy the Distiller software from Adobe, or stick with PageMaker or FrameMaker.

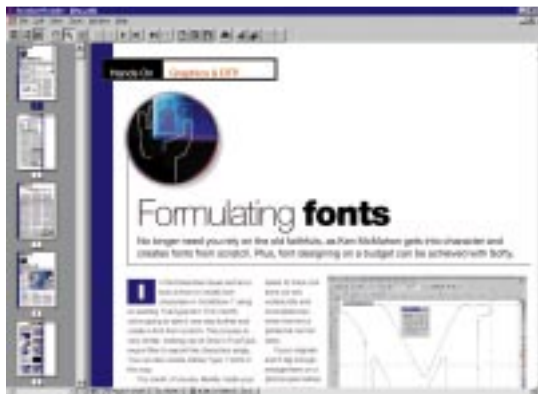
The second category is purely electronic and designed specifically for screen output. Although there are other formats for producing electronic documents, such as Corel Envoy or FrameMaker's own-brand technology, the one that has become central to personal computing over the past few years is HTML (Hypertext Markup Language, the *lingua franca* of the web).

Over the past decade or so, the phrase "death of paper publishing" has been greatly overused, and rightly ridiculed. There is currently more print being produced than ever in the history of the world, and even such high-tech enthusiasts as PCW readers continue to get their monthly fix on paper. So, is there such a thing as a one-stop solution for publishing to both paper and pixels?



**Left** Pageplus supports animated GIFs

**Below** Acrobat reader gives a near-perfect page image



Firstly, the design requirements for screen and paper are totally different. Print has a far higher resolution and so can be set at smaller sizes: in other words, more text and more detailed pictures on every page.

Many things we take for granted just don't work very well on screen. If you've studied the *Hands On* back issues on our PCW CD-ROM, you'll realise it's a

pain to have to scroll around from the bottom of one column to the top of another. Also, the limits of HTML mean that most of the typographical niceties are irrelevant. You can't do things such as overlay text and graphics unless you convert the text to a bitmap, so conventional DTP software, with its powerful typesetting and colour management features, is largely over-engineered for producing web pages.

This isn't to say it can't be done: all the packages here, except for Quark Xpress and GSP Pressworks, will create web pages. But the other side of the argument is whether DTP software is up to the job. Not all DTP software, for instance, supports animation which has now become ubiquitous (particularly so in banner advertising). Of the packages reviewed here, only Ventura, via Corel's Barista technology, has any support for Java-enhanced HTML as if you want forms, feedback, or buttons that light up you won't be able to implement these in any other DTP package.

If your web creation needs are simple and infrequent, then most of the packages reviewed here will suffice — but don't make the mistake of trying to output the same document to different media. If you want greater web creativity, then you'd be better off with the right tool for the job, such as HotMetal Pro, FrontPage or PageMill which scored highly in our January '98 issue group test of web-page design tools.

## Glossary

### Colour

The visual density of text. Well-set text has consistent colour, avoiding loose or tight lines and rivers.

### Crop and Registration marks

In commercial printing, oversized paper is used. Crop marks show where to trim the paper. Outside these, the Registration marks are used to line up successive colour runs.

### Drop cap

A large initial letter in a paragraph which "drops" down into the lines below.

### Greeking

To speed up display, screen text is "greeked" at small sizes; appearing as grey bars.

### Imposition

The arrangement of (i.e. book) pages on a larger sheet which can

be cut and folded to give the correct page order.

### Kerning

Closing the spacing between certain pairs of letters, such as AV, to create a more even appearance.

### Knockouts

When a patch of light colour is placed over an area of dark, the latter needs to have a corresponding hole "knocked-out" to stop it showing through.

### Leading

The spacing between lines, measured between the bottom of the lines of text. Text with leading — rhymes with *bedding* — equal to its point size is said to be set "solid".

### Linked frames

Text containers on the same or a different page, that can be

chained together to contain a single story.

### Master pages

Templates that contain items like headers, footers and column guides which are common to many pages. Multiple masters allow for a variety of layouts in the same publication.

### Pantone

A set of industry-standard colour libraries. Others include Munsell, Trumatch and Focoltone.

### Points, Picas

Type size measurements. A point is almost 1/72nd of an inch and there are 12 to a Pica.

### Process colour

A way of printing colour, especially photo images, by interspersing dots of different colour inks (usually cyan, yellow, magenta and black) in separate print runs.

### Rivers

Snaking areas of white space which can sometimes be seen meandering down badly typeset columns.

### Spot colour

Solid colour produced by a separate printing plate.

### Tracking

The spacing between letters in a section of text.

### Trapping

Generating a slight overlap between adjoining colours, to avoid white cracks caused by shrinkage or misalignment between print runs.

### x-height

The height of the body of a lower-case letter, measured from the letter "x". At the same size, the Arial typeface, for example, has a larger x-height than Times.



## Microsoft Publisher 98

**M**icrosoft has always taken the "keep it simple" approach in Publisher. Two features in particular have made Publisher the natural choice for those with no previous experience.

Firstly, the "help-as-you-go" panel slots in beside the workspace, much as do Ventura's Dockers, and it provides context-sensitive help at all stages. This can be hidden as the user acquires confidence and wants to reclaim valuable screen space.

Secondly, the other killer feature, Page Wizards (now largely copied elsewhere), provide a simple question-and-answer routine to help the user set up an elegantly pre-designed publication from a variety of templates which, in the past, have ranged from newsletters to paper aeroplanes. Once the Wizard has worked its magic, all the user has to do is replace the dummy text and picture placeholders with the appropriate contents.

### Extra-whizzy Wizardry

This release stays ahead in the Wizardry stakes by taking the concept further. Not only are there more templates (over 1,600 arranged in a catalogue) but the whole concept has been rethought. First, Design Sets let you create co-ordinated stationery and marketing materials with common logos, styles and other graphic elements applied to business cards, letterheads, brochures and web sites on a "corporate identity" basis. Second come 60 colour schemes that can be applied to any publication and save the user agonising over which colours look good together. Best of all, you don't have to start from scratch with a new Wizard if you change your mind, as you can change both the colour scheme and the overall design style of the entire publication with a few mouse clicks.

The Wizard interface has also been changed, with a control panel docked at the left of the screen: the top section offers a menu of actions and the bottom section the relevant options for each one. The price you pay for this, however, is in screen space: at 640 x 480 resolution, with the Wizard, Help and Help Index panes visible, your publication will be smothered with support and disappear completely.

Publisher 98 sees some long-awaited improvements in the art department, with the same splendidly-equipped drawing toolbar that graces Microsoft Office. This offers Bézier curves as well as several galleries of "smart" shapes including banners, stars, speech bubbles, flowchart symbols and "sticky" connector lines. There is also a range of gradient and textured fills and the WordArt text-tweaking feature now has a wealth of 3D effects complete with lighting, shadow and surface texture control. Other Office 97 spin-offs include the Office Assistant; an animated front-end for the help file and system messages. More usefully, the AutoCorrect and on-the-fly spelling checker, as seen in Word, are now standard in Publisher.

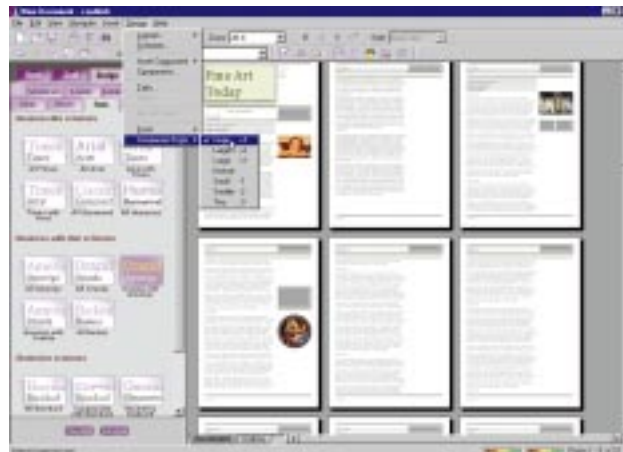
Previous versions had a gallery of pre-designed page furniture such as mastheads or coupons. This has been augmented and brought into line with the rest of the design Wizardry so these items, too, can be instantly formatted with the same "look". Earlier versions, in common with some competing packages, also remembered details such as your organisation's name and address which it would automatically insert where appropriate. This version goes further: you can have up to four stored profiles for business, home or other organisational use and store logos and colour schemes as well as textual information.

Publisher 97 saw a load of new web-page creation features with Wizards, button and bar clipart and hyperlink tools. With 98 there's much more, including support for animated gifs (with 340 supplied) and music clips. There's a Wizard to create navigation bars automatically, and support for forms. These come ready-made for signing-up, ordering and general response, or you can create bespoke forms from individual text boxes, lists, checks and buttons. For more experienced web authors there's a pop-up editing window for inserting fragments of



Left Instant colour schemes and plenty of help in Publisher

Below Fill up a form: more web wizardry from Microsoft



raw HTML code. Any paper-based publication can be converted to a web page, and vice-versa. Finally, there's a Web Publishing Wizard to cope with uploading the finished pages to an Internet Service Provider.

In terms of professional features, Publisher scores poorly. There's little precision control over placement and typography although you do get both automatic and manual kerning. There is neither table-of-contents, nor indexing, and no story editor, although there is an option to use Word for this (if you have it). There is no support for Pantone or other standard libraries and colour separations are limited to two spot colours.

There's a generous clipart collection and more is available from the Clip Gallery Live web site. One major annoyance is that although the program installation takes a reasonable

24Mb, for the Wizards to work properly another 85Mb of clipart must be installed. This cannot, as most applications, be accessed by leaving the CD-ROM in its drive but must be copied to the hard disk. Worse still, if you already have Office installed, this will default unchangeably to your C: drive.

### PCW Details

**Price** £99.99 (£85.10 ex VAT)  
**Contact** Microsoft 0345 002000  
[www.microsoft.com/publisher/](http://www.microsoft.com/publisher/)

**System Requirements** Windows 95.

**Good Points** New Wizards offer more choice and flexibility. Well-equipped for web publishing.

**Bad Points** Limited typographic and colour support. Clogs your hard disk with clipart that would be better left on the CD-ROM.

**Conclusion** Simple and fun. A good choice for the beginner.

★★★★★

## Serif PagePlus 5

**S**erif prides itself on being the company that offers professional features at a budget price, and PagePlus 5 continues the tradition of showing that this is not just sales talk.

High-end features include precision layout which, while not quite up to Quark's legendary split-hair standards, nevertheless offers one-tenth of a point, millimetre or degree sizing and placement, as well as both manual and automatic kerning.

Colour is professionally handled, with Pantone solid and process colour libraries built-in. Page Plus will produce both spot and process colour separations, with automatic trapping if required.

This version sees some welcome streamlining of the interface. The button bars have been slimmed down to give more workspace, and the rather idiosyncratic Change and Status bars which govern the formatting and placing of objects have been rationalised considerably. Settings such as font names, which were previously unreadable in the too-narrow box, have wisely been moved to a standard WP-style formatting ribbon and the other controls have been combined into one small, tabbed, palette.

A criticism of earlier versions was that it was poorly-featured for longer publications. This version at last rectifies that to some degree, with both indexing and table-of-contents creation. Both of these, as with many of PagePlus' features, are Wizard driven and thus don't constitute too much of a challenge, even for beginners. Those producing documents with a variety of page layouts, however, are still stuck with just left and right master pages, although in fairness it must be said that the rest of the budget applications here are similarly limited.

### Back on the table

Serif veterans will be pleased to see that TablePlus, which mysteriously disappeared for a few versions, is back and looking better than ever. As its name suggests, this is an applet for producing tables, and it comes equipped with spreadsheet-style functions. As such, it considerably outclasses PageMaker for doing things such as summing, or averaging rows and columns. It has a built-in calculator for entering numeric formulas and "smart" features such as the autofilling of formulas or series across a range. It's good-looking as well as clever, with a range of fill and outline effects and the facility to angle text in cells. This latter is especially useful when lengthy titles have to be placed at the head of narrow columns.

Other accessories include LogoPlus, for layering text and shapes and producing special effects for logos or other artwork and the WritePlus story editor which comes equipped with both spelling and grammar checking. Further proofing is available from the new Layout Checker, which spots potential problems such as items being off the printable area of the page, or text in columns not lining up. This could be better implemented, however. When it advised us that our columns didn't align, it didn't suggest any method of correcting the problem and a trawl through the help file also failed to find an answer.

There are two more new features, in the shape of Calendar and Mailmerge wizards. The former does exactly what its name suggests, with options of having space to write in the printed calendar. The latter, although somewhat unusual for DTP, was first seen in Microsoft Publisher. You could, for instance, have a printed-on label to mail newsletters, or simply personalise your Christmas cards.

### HTML at heart

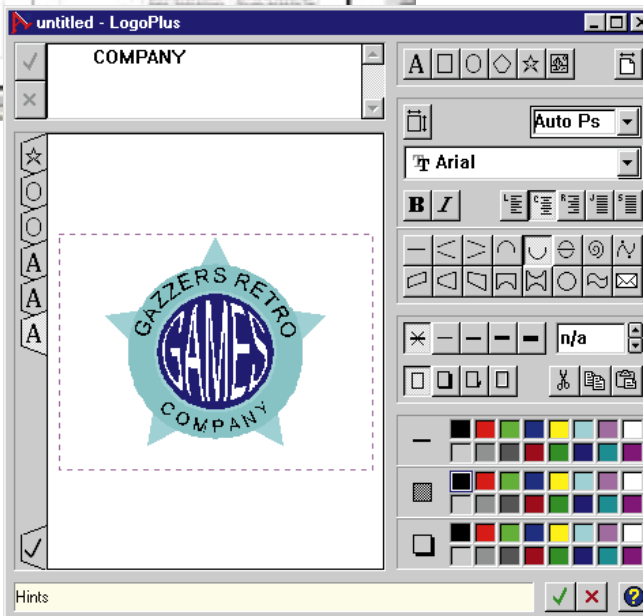
The main news is in web design. Serif has taken HTML to heart in a big way. First, there is a set of Page Wizards for creating a variety of ready-made web pages for personal, business and community use. There's a quick Hyperlink tool to attach URLs to text or graphics, or for more



Personal  
Computer  
World  
**Editor's  
Choice**

Left A streamlined interface and a drag-and-drop clipart browser

Below PagePlus's mini-drawing applet, LogoPlus, in action



subtle surfing a Hotspot tool that can be used transparently anywhere on the page, so you can create image maps consisting of several jumps attached to different parts of a larger graphic. There are tools for creating scrolling text marquees, support for animated gifs (with 99 samples) and, rather cheekily, a copy of the Microsoft Web Publishing Wizard for getting the whole thing up and running, on site.

Serif has always taken pains to give value for money and there is a lot here, including Wizards, Tutorials and a good graphic file browser. There's a plentiful supply of resources, too: over 17,000 clipart items, 400 fonts and lots of wizards and templates. But, as ever you get what you pay for, and neither the fonts nor artwork are of particularly high quality. Another drawback is that you can only work on one document at a time, but this has been alleviated somewhat by the introduction of the Portfolio, which acts as a central store for page elements, including text, graphics and OLE objects created in the table, logo or calendar applets. But unlike Quark XPress' Libraries, you can only have one Portfolio and this limits its use if you are creating lots of differently-styled publications.

### PCW Details

- Price** £99.95 (£85.06 ex VAT)
  - Contact** Serif 0800 376 7070, [www.serif.com](http://www.serif.com)
  - System Requirements** Windows 95.
  - Good Points** Inexpensive. Easy to use. Surprisingly well-equipped.
  - Bad Points** The quality of the fonts, templates and clipart don't do justice to the program.
  - Conclusion** Excellent value for the power user on a budget.
- ★★★★★

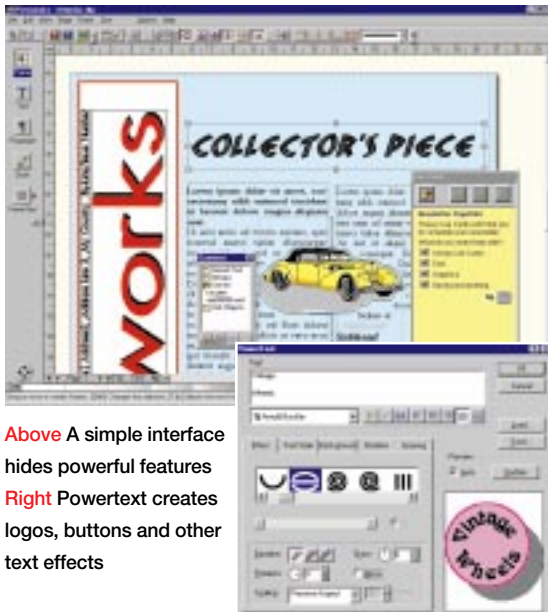


## GSP PressWorks 2.5

**T**here's good news for the large number of people who are still using Windows 3.1: GSP includes both 16- and 32-bit versions of the product on the same CD-ROM.

Here, Page Pilots fulfil the role of Wizards and these come equipped to deal with everything from business stationery to full-length books. The templates are UK localised, with comforting terms such as "VAT" and "Postcode". As with the Microsoft and Serif products, there is plenty of hand-holding, with Cue Cards and "first-time help" for many features.

The key to the interface is the "mode" buttons to the left of the screen, where you switch between creating and formatting frames to hold text, formatting on a paragraph level, editing text and formatting at character level, drawing and inserting graphics or Powertext objects. The top toolbar changes to suit the mode, with a text formatting ribbon, standard drawing tools and so on. It can get a little tiresome at times, especially when you switch to drawing and realise you must first create an empty frame. The next version of Pressworks, due out shortly, will be "modeless".



**Above** A simple interface hides powerful features

**Right** Powertext creates logos, buttons and other text effects

Despite the budget price, there are some professional features: Pantone support, spot and process colour separation and trapping. Typography and design is adequate, with good drawing tools, rules for letter and word spacing, and both internal and external text wrapping.

Document management is not quite as strong. Notwithstanding the book Pilots, there is no indexing or table-of-contents generation. In compensation there is a very useful Contents palette. Rather like Ventura's Navigator, this lists all the imported text and graphic files, or chunks of text you have named within the program. It can also serve as a holding area for files that have been imported but not yet placed in a publication, and shows basic information such as the size of a graphics file or how much of a story

remains unplaced.

Bundled with this is a tiny clipart collection, 35 own-brand fonts, and utilities to browse clipart and PhotoCDs, customise the keyboard and manage font groups.

### PCW Details

**Price** £39.95 (£34 ex VAT)

**Contact** GSP 01480 496575  
[www.gspltd.co.uk](http://www.gspltd.co.uk)

**System Requirements** Win3.1 or 95.

**Good Points** Easy to use. Cheap, with power for those who need it.

**Bad Points** A modest bundle of clipart and fonts. No web output.

**Conclusion** The price and modest system requirements make for an excellent solution to a tight budget.

★★★★★

## ipublish 2.0

**I**f you still find the Wizard or Pilot approach too difficult or time consuming, ipublish takes the helping-hand approach even further. It is aimed, as the blurb puts it, at: "Busy professionals with little or no design training," offering a one-stop solution to paper, web and other screen-based output.

Start it up and, having chosen from one of ten publication categories, you find yourself with your publication on the right of the screen and a pane full of thumbnail views of layouts and colour schemes on the left. Select from here and the left pane shrinks to a four-tabbed control centre and your document expands, with picture and text placeholders already in place.

You will now find yourself at the Grab stage, in an environment uncannily like a web browser — which is exactly what it is! Here you can select graphics from the CD-ROM or, if you have an internet connection, direct from the ipublish web site. You can also, of course, browse your hard disk for text and graphics files, or type directly into the placeholders.



**Above** Browser-based "Grab" lets you assemble a page

**Right** Patronising? Moi? Typographical control is rather limited



The next stage is Design, where you can reconsider your original layout and colour scheme choices. Again, everything is taken care of and you don't have to resize frames or move things around. If you want to change aspects of a single element, such as a headline or a story, then the choice becomes more limited. You can't resize a picture with the usual handles, and font sizing is limited to a seven-step range from Tiny to Huge. The final tab, Publish, lets you choose whether to output to paper, web or on-screen presentation and set up page size and numbering, which seems, perhaps, rather a back-to-front approach.

When it works, this "hands off" approach works well.

The templates are elegant, and especially suited to repetitive layouts like catalogues, with lots of same-size illustrations and texts. It's not as good with a more random mix or long texts, and it's easy to encounter

problems such as large areas of unfilled page or too-small graphics. Trying to rectify this, or fine-tune a publication can, at times, be seriously frustrating and the program also seems to slow dramatically with longer texts.

### PCW Details

**Price** £58.99 (£50.21 ex VAT)

**Contact** Design Intelligence  
0118 9814230 [www.ipublish.com](http://www.ipublish.com)

**System Requirements** Windows 95

**Good Points** Very easy multiple choice-driven page creation for paper and web.

**Bad Points** Frustrating if you want to depart from the pre-designed schemes.

**Conclusion** Fun and easy, especially for those in a hurry, but it won't suit the more creative user.

★★★★★



**Editor's Choice**

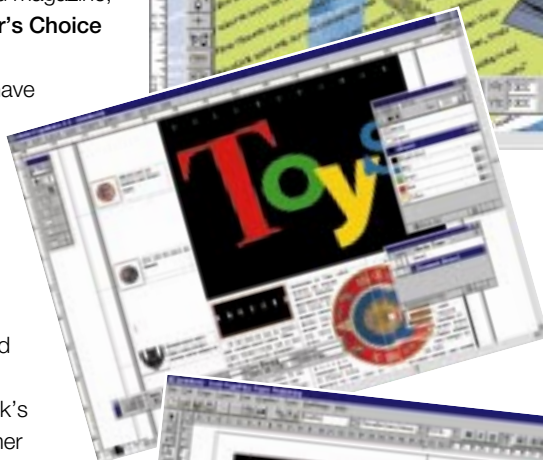
**A**t the high end, despite the high price and lack of any bundled extras, it doesn't look likely that anything will topple Quark XPress from its professional magazine perch. Its widespread popularity is reflected in the plentiful supply of third-party Xtras and in the universal acceptance by pre-press and printing houses, whether using Macs or PCs. The long-awaited new features are well thought out but at the same time the program designers have resisted the bloatware bug and kept the interface as simple and uncluttered as ever. So if you're starting up a newsstand magazine, **Quark XPress** gets our **Editor's Choice** as being simply the best.

Most users, however, will have less ambitious aims and the battle for second place is fiercely contested. Both Ventura and PageMaker are highly respectable and powerful applications. Both offer a far more value than XPress, with bundled fonts and extra proofing languages as standard for a fraction of Quark's recommended price. The former certainly offers the most for your money but you should take a long hard look at how much of that stuff you really need. Is a clipart library essential, or will you only be using original artwork? Do the bundled extras, such as WordPerfect and the OCR software, really add value for you? Do you really need the extensive illustration tools, or will you be importing graphics from a separate, purpose-made application?

We thought long and hard about this and decided to focus on the core activity of desktop publishing rather than be swayed by sheer size. As such, we found **PageMaker 6.52**, with its cleaner and less obtrusive interface, put less between the user and their work so we **Highly Commend** it in the high-end section.

**Budget DTP**

Down in the under-a-ton basement, there can be only one winner. Serif consistently offers more for your money, not just in terms of extras but in hard-nosed professional features for precision typesetting and commercial colour



**Illustrated, top to bottom: Quark XPress 4.0, Adobe PageMaker 6.52, Serif PagePlus 5, GSP PressWorks 2.5**

from a reputable foundry, rather than four hundred own-brand versions? Despite this quibble, we have no hesitation in making

**PagePlus 5** our **Editor's Choice** of the budget products.

Of the remainder, the UK-developed PressWorks 2.5 commands special attention. Despite being priced at under £40, this is no bin-end bargain product. GSP continues to

develop and support the application, and also markets a range of similarly-priced complementary products for illustration and image-processing. Add to that its

printing. The welcome return of the table editor and the provision of indexing and table-of-contents generation now expand its capabilities to long document management as well as page design. The interface has matured into a comfortable and elegant working environment. We note, though, that it's about time the huge but rather cheesy clipart collection was revamped. And how about a hundred really good typefaces

modest hardware requirements and this means even the poorest of church mice should be able to produce a professional-looking parish magazine. As such, **PressWorks 2.5** is **Highly Commended** to anyone who doesn't have the option of throwing money at their DTP problem. ■





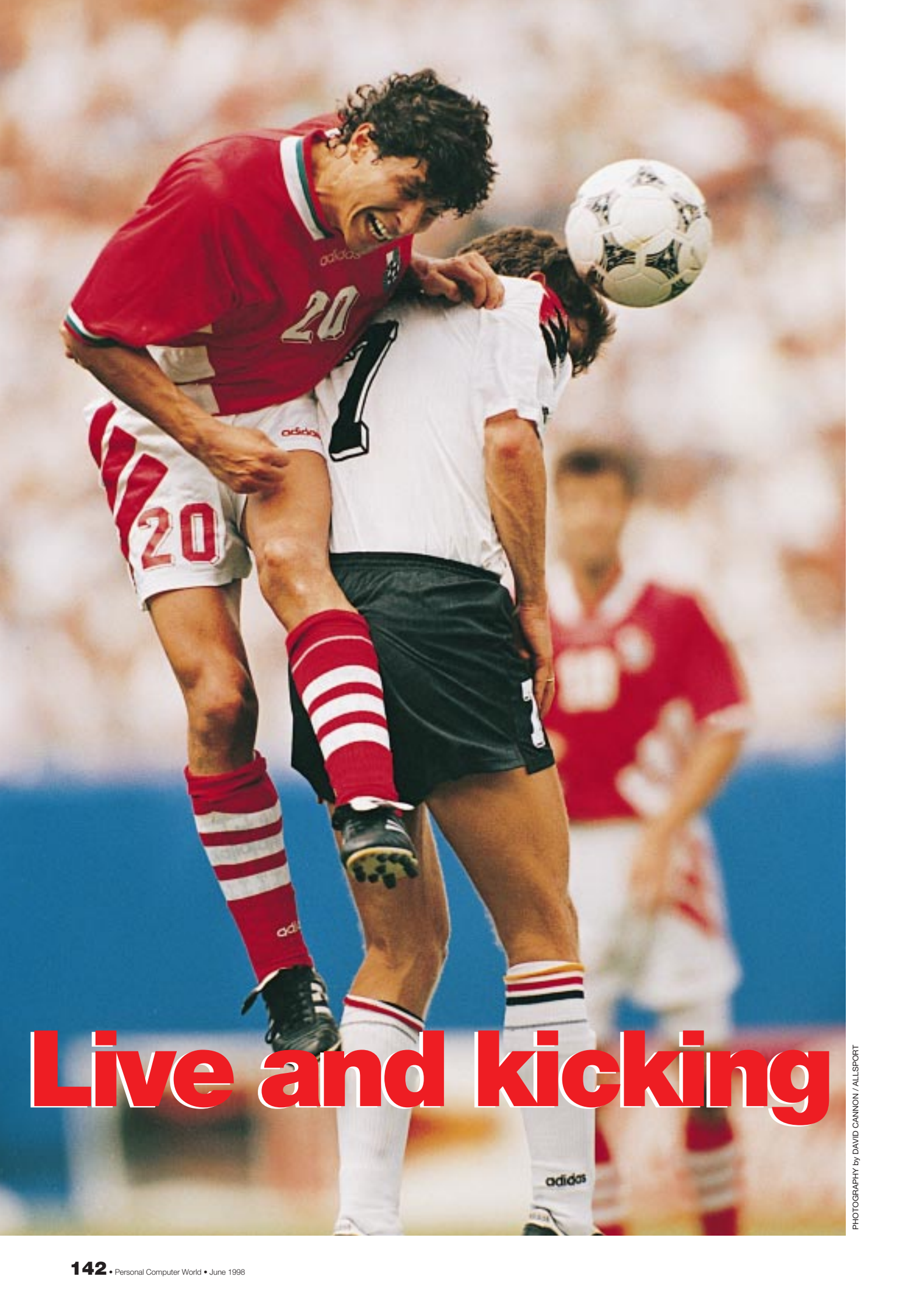
Table of Features				
				
Product	XPress 4	PageMaker 6.52	FrameMaker 5.5.3	Ventura 8 (beta)
Supplier	Quark Systems	Adobe	Adobe	Corel
Telephone	01483 454397	0181 606 4001	0181 606 4001	0800 973189
URL	<a href="http://www.quark.com">www.quark.com</a>	<a href="http://www.adobe.com">www.adobe.com</a>	<a href="http://www.adobe.com">www.adobe.com</a>	<a href="http://www.corel.com">www.corel.com</a>
Price ex VAT	£1,320 (Passport) £995 (English)	£422	£440	£319
Price incl VAT	£1,551, £1,169	£495	£517	£374
Platforms	Win95, NT, Mac	Win95, NT, Mac	Win95, NT, Mac, Unix	Win95, NT
Min processor, RAM, disk	486, 12Mb, 12Mb	486, 8Mb, 26Mb	486, 16Mb, 15Mb	Pentium, 16Mb, 80Mb
Multiple documents	●	●	●	●
Table of contents	●	●	●	●
Indexing	●	●	●	●
Pantone libraries	●	●	●	●
Spot separations	●	●	●	●
Process separations	●	●	●	●
Hexachrome separations	●	●	○	●
Trapping	●	●	○	●
Wizards	○	○	○	●
Text editor	○	●	○	●
Master pages	Multiple	Multiple	Multiple	Multiple
HTML output	○	●	●	●
Acrobat output	○	●	●	○
Add-ons / scripting	●	●	●	●
Fonts supplied	0	220	220	1,000
Supplied font format	N/A	PostScript	PostScript	Both
Clipart collection	0	0	750	40,000

Table of Features				
				
Product	PagePlus 5	Publisher 98	Pressworks 2.5	ipublish 2
Supplier	Serif	Microsoft	GSP	Design Intelligence
Telephone	0800 3767070	0345 002000	01480 496575	0118 981 4230
URL	<a href="http://www.serif.com">www.serif.com</a>	<a href="http://www.microsoft.com">www.microsoft.com</a>	<a href="http://www.gspitd.co.uk">www.gspitd.co.uk</a>	<a href="http://www.ipublish.com">www.ipublish.com</a>
Price ex VAT	£85.06	£85.10	£34	£50.21
Price inc VAT	£99.95	£99.99	£39.95	£59
Platforms	Win95	Win95	Win3.1, Win95	Win95
Min processor, RAM, disk	486, 8Mb, 25Mb	486, 8Mb, 109Mb	486, 4/8Mb, 5Mb	486, 16Mb, 65Mb
Multiple documents	○	○	○	○
Table of contents	●	○	○	●
Indexing	●	○	○	○
Pantone libraries	●	○	●	○
Spot separations	●	●	●	○
Process separations	●	○	●	○
Hexachrome separations	○	○	○	○
Trapping	●	○	○	○
Wizards	●	●	●	●
Text editor	●	○	○	○
Master pages	Pair	Pair	Pair	○
HTML output	●	●	○	●
Acrobat output	○	○	○	○
Add-ons / scripting	○	○	○	○
Fonts supplied	400	179	35	44
Supplied font format	TrueType	TrueType	TrueType	TrueType
Clipart collection	17,000	13,000	105	1,000

● Yes ○ No





# Live and kicking

PHOTOGRAPHY BY DAVID CANNON / ALLSPORT



## John Rennie kicks off the football fan's dream season with a look at how technology is involved in World Cup 98. From games to the net, and from Virtual Replay to the incredible logistics involved, computers will be star strikers

It's 30th July 1930, and host nation Uruguay brings the inaugural World Cup to a close, with a 4-2 drubbing of neighbours and arch rivals, Argentina. The Montevideo final is the climax of an invitation tournament — one which England has sniffily declined. It involves eight South American teams, four from Europe and four from the USA.

The competition has been born out of arguments with the International Olympic Committee (IOC) over the non-amateur status of football players. Stadia are packed to overflowing for the South American derbies. The USA vs Belgium is, predictably, less of a draw. And the whole tournament passes off with barely a mention in Europe, apart from a dismissive word from the president of the IOC: "That's the first and the last World Cup we'll see."

Famous last words indeed. On 12th July 1998, two teams will contest the final of the 15th World Cup. Over the course of five weeks, 64 games, ten stadia and nine cities, 32 countries will have been whittled down to the final pair. Two and a half million people will have attended matches. Viewing figures will be close to 37 billion worldwide, compared to around 21 billion for the most recent Olympics in Atlanta.

Imagine the World Cup as a medium-sized enterprise with a plethora of IT needs, with the specific requirement of marshalling and delivering information to very tight and specific deadlines, and getting that information to 50,000 new staff over ten sites, and you're getting the picture. Oh, and this is a business that has to hit the ground running from Day One, just to be closed 35 days later.

### Logistical nightmare

These are problems that the four men and a dog who put together the 1930 Uruguay tournament didn't need to address. You booked the stadium, invited a few friends, sold the tickets and everyone turned up. Today, the logistics bend the brain: this project should be impossible. And when the organisers of France 98 began to plan the tournament five-or-so years ago, what quickly became apparent was that rather than bolt together existing systems, stadia, ticketing arrangements and the like, what had to be done was to design the whole competition from the bottom up.

Managing this nightmare of logistics is the Comité Français d'Organisation (CFO), effectively the franchisee of world football's organising body, FIFA. Hewlett-Packard (HP), with one eye on the public relations nightmare which was IBM's handling of the information systems at the Atlanta Olympics, is the company entrusted with making the whole thing happen.

Anyone who watched the recent France vs England rugby union international at the Stade de France in Paris, can't help but to have been impressed by the city's new flagship stadium. Look at Wembley, and you see an arena of the old school. The crumbling national showcase, built

in the early twenties, was basically constructed as a large shed in which to cram as many standing punters as possible, and never mind comfort and safety.

Football matches in the nineties make different demands on architects and designers. Everyone is seated and that means getting in and out of grounds takes that much longer. The modern football fan demands luxuries like toilets that work and snack bars where you can get served quickly during the brief half-time break. People arrive at stadia in cars and need to park. And consider the logistics of getting 50,000 confused foreigners in and out of an unfamiliar stadium in double-quick time and back to the centre of Paris. Then there is the unfortunate tendency of some football fans, particularly the Dutch and the English, which fills the organisers with particular trepidation: they want to beat each other to a pulp and so need to be kept apart.

### Just the ticket

To tackle this brief, HP put its CAD system in place in 1995 to design the new ground. The system was used to sketch out not just the alternative designs for the new stadium, but to put in place the construction plans, model the arena into existing city maps and produce maps of the villages, press centres, security perimeters and the signage that speeds the baffled visitor on his way. The system was based on a central graphic database, hooked up to an optical jukebox. As the infrastructure moved into place, the system was then used for individual ticket planning.

It was not simply a matter of splitting the stadia into halves for each set of supporters. For instance, there will be many more Dutch than Mexicans at the Holland vs Mexico game but both need to get enough room, access to all facilities and be kept apart. To grasp some idea of the size of the task, think of the 2.5 million tickets that have been sold for this five-week football fest. Then think of Manchester United's Old Trafford, the biggest club stadium in

Britain, packed every fortnight with 55,000 fans. Now think of two-and-a-bit seasons' worth of United games in just over a month. But, unlike many United fans, these people are not season-ticket holders and have never been to the ground before.

BEN RADFORD / ALLSPORT



**Soccer action between the USA and Switzerland in the previous World Cup**

p144 >

## On side and online: a web fan's guide to France 98

Let's face it, the net is where the sports anoraks among us will be gleaning our information. We've probably never been better served for stats, stats and more stats.

- The Content Engine, the group of servers which will contain all the facts and figures almost as they happen, will feed into the official web site as well as the journalists' secure intranet, so you should know the facts as soon as they do. You can also see what they do with them! Click on [www.france98.com](http://www.france98.com).
- Go to the official FIFA site for background on the history of the tournament. One for the footballing pros here, with a rundown of the rules and regulations of the tournament. And remember, FIFA always uses the World Cup to force through rule changes. Watch out for a ban on the tackle from behind in this summer's championship. Go to [www.fifa2.com](http://www.fifa2.com).
- For breaking news on the teams in the run-up to France 98, see [www.wldcup.com](http://www.wldcup.com).
- If you fancy a more active role in the tournament, like managing a team, you'll find more fantasy league sites on the web than you can shake a browser at.
- And, finally up and running is the long-awaited Football 365 site, managed by Under The Moon presenter Danny Kelly, which is not only a daily-updated online football paper, but also uses push technology to deliver personalised stories on your favourite teams and topics. Go to [www.football365.co.uk](http://www.football365.co.uk).
- For the latest reports, betting and statistics it's always worth taking a look at the *Sporting Life* site at [www.sporting-life.com](http://www.sporting-life.com).

Of course, not everyone is so enamoured of the gambling fever set to sweep the planet. Peter Cox, of computer security company Internet Smartware, reckons many firms will struggle to keep business-critical computer

systems working as they get overloaded with workers running sweepstakes and placing bets using company email.

Okay, Mr Cox is probably overstating the case a little here (not surprising, as he has email filter software to sell) but with 107 million hits on the official World Cup web site, he has a point. With many companies concerned at the amount of email junk, never mind World Cup web fever,



clogging up memory and soaking up employee time, we could see more of them employing software to scan workers' email.



Get the news online:  
(clockwise from top) FIFA France 98, the World Cup web site, the FIFA site, the Manchester United site

The ticketing was split into stages: reservation, allocation, production of the tickets in May 98 (deliberately late to counter fraud) and mailing. When you finally receive your ticket, you will see that it bears your name: in an attempt to counter theft and touting, HP makes the boast that in the event of trouble, the combination of in-stadium CCTV, numbered seating and named tickets means the authorities will know who you are.

This slightly "Big Brother" approach could be a double-edged sword. Imagine the nightmare scenario for the world's second-biggest computer company, an American giant, dipping a nervous toe into this strange world called soccer. One of its corporate clients receives his complimentary tickets and finds at the last minute he can't go. He gives the tickets to a friend, who gives them to a friend who sells them. The recipient, wearing his Spurs shirt resplendent with its Hewlett-Packard sponsor's logo, is then caught on CCTV having a frank exchange of views with a Belgian fan. "No problem, we can track back on who supplied the ticket... Oh, dear..."

### Personnel department

Now we've dealt with the small matter of 2.5 million fans, we move on to the large army of accredited personnel: players, media, stadium staff and volunteers. There are

around 50,000, each of whom has to be allocated a swipe pass tailored to their status. You don't want Jean-Claude the barman wandering into the England dressing room at half-time, and by the same token, Gazza is unlikely to require access to the main stand's kitchen or bar areas (*are you sure? Ed*). The processing target is to give everyone a time period during which they can turn up for logging-in (say Monday a.m. to Tuesday p.m.) and HP claims it will have each person photographed on digital camera, processed through a Vectra PC, and their picture mounted and laminated on a swipe card with no more than a five-minute wait. No player will pass water after a match without it going through HP's gas chromatograph mass spectrometer, urine dope-testing system. No fan will gain access to the ground without their ticket being swiped through an HP reader. No journalist will file copy without access to the HP intranet, and no World Cup worker will go through their day without being tracked and assigned tasks from the HP database.

That's enough statistics! I hear you say. I just want to roll up and see a game of football. I don't want a hotel, or a Eurostar ticket, or to disappear into HP's database; I just want a ticket. Well, you can't, and this is where the CFO has run into trouble both with disgruntled fans and with hacked-off Football Associations around the world.

By late March, the CFO was facing a legal challenge from the EC because of its policy of giving French citizens first refusal on tickets. A policy which, when coupled with the huge allocation of tickets to corporate hospitality, means there will only be about 3,000 regular England or Scotland fans at their respective matches. With early allocation and non-transferable tickets, the CFO faces minor draws like South Africa vs Saudi Arabia playing to half-empty grounds. There may be a message here: where do you draw the line between organisation and inflexibility? For many a fan, it may feel like he is serving the system rather than vice versa. And how many Joe Punters can shell out for ticket packages which cost the

thick end of £1,000? Not many. The participation of most will end with frequent hits on the official website run by... yes, you guessed it: Hewlett-Packard.

With Atlanta in mind — spectators and athletes being bussed to the wrong venues, journalists unable to access the pictures database, or even find somewhere to plug in the laptop and file copy — HP is desperate not to reap the same appalling PR coverage that IBM attracted. This should be not only the first world sporting event modelled by IT (rather than IT systems being something which is bolted on later) but it also promises to be superbly organised. Me? I'm joining the queue for the web site, getting the beers in and watching it on the telly. ■

## Model footballers

**T**hey think it's all over... it is now! Er, no, it isn't, actually. And by the way ref, your decision isn't final any more. For the past year or so, viewers of Sky football coverage have marvelled at Andy Gray's dexterity with Virtual Replay as he plays God and reruns borderline decisions. There's no blurry slo-mo, as Virtual Replay lets you move around the players to get a closer look.

Sky has already used the system to remodel Geoff Hurst's second goal from the 1966 World Cup final. The bad news for Geoff and the referee who allowed the goal is that the ball didn't cross the line. The bad news for Franz Beckenbauer and his German team is that Virtual Replay was invented 30 years too late to do anything about it.

The application works by creating 3D images from captured video

footage: if a player is facing you in a 2D video clip, the back of his head literally doesn't exist on the captured image. Virtual Replay constructs a walkaround image from what it sees on the video, but most importantly, the positions of player and ball remain the same.

The implications for action replays are obvious. Cricket has succumbed to the third

umpire, who reruns the action on run-outs and glove/bat decisions with the aid of slow motion. But cricket is a stop-start game anyway. Many people fear that football, subjected to an even finer system of rerun, might end up staging three-hour games.

Now manufacturer Orad has bolted Virtual Replay to another of its products, Digital Replay, which tracks player and ball and can be used to break down the physical approach of the player for training purposes, and is ready to push something called VirtualLive onto your desktop. But why?

Watching a remodelled game via VirtualLive on your PC will be rather like watching a 3D computer game (but one which you can't influence) and takes watching football on TV a stage further. You'll be able to rerun clips, watch a goal from any angle and see the game from the player's point of view. Orad's Miky Tamir explains why you'll want to watch this stuff: "The big advantage over video is the bandwidth. Once you've downloaded the models of the players and the stadium, you just have to update the positions of heads, legs and so forth. So very little data needs to be sent for real-time transmission." VirtualLive can be used to rerun footage on TV broadcasting and Orad reports some British TV companies showing interest.

Andy Gray was on the brink of taking up the managership of Everton a couple of years ago, but BSkyB slapped on some lucrative golden handcuffs, so impressed were they by his dexterity with Virtual Replay. Now, if I can just work out these controls...



**They thought it was all over. But it isn't. Virtual Replay shows that Geoff Hurst's controversial second goal in the 1966 World Cup final did not, in fact, cross the line**



## Getting technical

**L**et's be blunt: the one bunch of people you do not want to annoy, when planning your information systems, are the journalists: you upset them, they tell their readers. One of the biggest own goals Atlanta scored was making it tough for these hacks to file their copy. The task for France was firstly to make a mission-critical system, resistant to crashes, glitches and general falling over, and secondly to milk the ability of IT to deliver collated and compared statistics. With the first in mind, Hewlett-Packard (HP) hasn't pushed

its most state-of-the-art hit into this particular loop, but is going with the tried and tested. Regarding the second, we haven't caught up with the Americans yet in our obsession with sports stats, but anyone who has watched football on Sky will have seen their burgeoning use: possession time, corners won, shots on goal, percentage of play in each area of the pitch — the fans love it.

Statistics are collected on a central server that feeds the internet as well as a secure intranet exclusive to the media. At the heart of this is

the Content Engine, a cluster of Unix system-based HP 9000 Enterprise Servers. The intranet side, Info France 98, is accessible only by accredited journalists, so back to those swipe-card sessions mentioned earlier. The system is designed to provide access to stats and data in media centres at all ten World Cup venues, as well as at the International Media Centre in Paris. The network comprises 30 HP NetServer systems and HP Vectra PCs. And, as the press will be filing their copy from the same rooms, nothing should go wrong!



## PCW's IT dream team



If 11 IT executives were football players, what would your dream team be? PCW presents its top team from the world of computing with comparisons to some of the greatest players in the English game.

■ **Bill Gates (Microsoft) / Alan Shearer (Newcastle)**

Could be found wanting in the excitement stakes, but the most expensive and most productive player in the game.

■ **Alan Sugar (Amstrad) / Tommy Smith (Liverpool)**

A combative, not-to-say vicious, centre-back. These days though, the game has changed.

■ **Steve Jobs (Apple) / Jurgen Klinsmann (Tottenham Hotspur)**

Flashy quixotic who ignored the dictum of never going back to your first team. Fellow players have questioned his team spirit.

■ **Sir Clive Sinclair (Sinclair) / George Best (Manchester Utd)**

Ah, the dangers of hubris. This boy had it all and lost it. Last seen leaving the ground in a curious motorised roller skate.

■ **Marc Andreessen (Netscape) / Robbie Fowler (Liverpool)**

So much so young. The dangers are that your star can wane as quickly. Not, in this case, undone by a young pretender but by seasoned

pro, Microsoft. It was nice while it lasted.

■ **Paul Allen (Microsoft) / Chris Sutton (Blackburn Rovers)**

While others get all the plaudits, this one just comes up with the goods time after time. Not flashy, but effective.

■ **David Filo (Yahoo!) / Michael Owen (Liverpool)**

Robbie Fowler revisited. But will it all go pear-shaped for Yahoo!?

■ **Derek Dukes (Yahoo!) / Rio Ferdinand (West Ham United)**

See the boy Filo. But, like the above, an old head on young shoulders.

■ **Nolan Bushnell (Atari) / Stan Collymore (Aston Villa)**

Atari was once worth £16bn: recently the back catalogue was sold off for £3m. Stan cost £7.5m, now he's playing like he cost ten bob.

■ **Gil Amelio (Apple) / Fabrizio Ravanelli (Middlesbrough)**

Lavishly talented player of Italian extraction who was going to save Middlesbrough/Apple. And then he didn't. And then he was gone.

■ **Michael Dell (Dell) / Denis Irwin (Manchester United)**

Reliable, unspectacular, some might say dull. But has been in the game so long he's seen a generation of young pretenders come and go. Very solid in defence.

## Participation sport

Increased processing power and multimedia capabilities mean that soccer simulations are getting better and better. Of the current batch, two in particular stand out: EA Sports' Road to the World Cup, and Gremlin Interactive's Actua Soccer 2. Enhanced by smoother graphics and playability, they also have commentary from such luminaries as John Motson, Des Lynam, Barry Davies and Trevor Brooking. Like most games you will, however, need good multimedia capabilities. Watch out, too, for a new title from EA Sports called World Cup 98, and for Adidas PowerSoccer from Psygnosis.

At the other end of the gaming field are the management simulations, recreating everything related to the precarious business. The best of these is the latest version of Championship



Manager from Eidos. Containing hundreds of players and teams from all the major European leagues, you can achieve the impossible by keeping Spurs in the Premier League. There are a few similar titles available, such as Europress' Total Football Management.

caused north of the border when it was discovered that Scotland had been put on the Old Kent Road. And our cover-mounted CD features a full version of Kick Off, completely gratis. Sweet as a nut.

Jim Haryott

### Spurs are winning! But it's only a computer game, Actua Soccer 2

Then there are the Encyclopedias, a surefire way of securing new soccer-mad friends. The Ultimate Encyclopedia of Soccer, from Europress, is packed with facts and clips but is now slightly outdated. Also worth a mention is Arsenal Inside Highbury from Anglia Multimedia (purely because I can't hide my bias!).

In this issue (p317) you can read about Monopoly World Cup, notable for the fuss it

### The big match games

Adidas PowerSoccer	£29.99
Road to the World Cup	£39.99
Actua Soccer 2	£39.99
The Ultimate Encyclopedia of Soccer	£9.99
Total Football Management	£29.99
Arsenal Inside Highbury	£29.99
Championship Manager 97/98	£19.99

Psygnosis	0151 282 3000
Electronic Arts	01753 549442
Gremlin Interactive	0114 263 9900
Europress	01625 855024
Europress	01625 855024
Anglia Multimedia	0500 600191
Eidos	0181 636 3000

<a href="http://www.psygnosis.com">www.psygnosis.com</a>
<a href="http://www.ea.com">www.ea.com</a>
<a href="http://www.gremlin.co.uk">www.gremlin.co.uk</a>
<a href="http://www.europress.co.uk">www.europress.co.uk</a>
<a href="http://www.europress.co.uk">www.europress.co.uk</a>
<a href="http://www.anglia.co.uk">www.anglia.co.uk</a>
<a href="http://www.eidos.com">www.eidos.com</a>



# Triple jump

Fast? Not half! Even though 333MHz PCs may soon be overtaken by even quicker machines, the price is right today. Lynley Oram put ten tearaways on the starting blocks and watched them race away.

Only six months ago we were excited about Pentium II processors running at an incredibly speedy 266MHz. But in the quick-paced world of IT, these bits of silicon are already well on the way to becoming tomorrow's entry-level CPUs.

Intel's 300MHz processor marked the end of its first-generation (Klamath) Pentium II product line. The second and latest range, codenamed Deschutes, starts with the 333MHz CPU. With faster models like the 400MHz just around the corner (see page 212), the 333MHz is falling in price. So, we decided to round up ten machines based around the 333MHz Pentium II, accompanied by 64Mb of memory, and all running Windows NT 4.

We didn't put a price point on these machines. Instead, we asked each company to supply us with the sort of machine they'd sell to a customer looking for a corporate workstation. Otherwise, we just supplied minimum specifications: 6Gb or more storage space on the hard drive, at least a 17in monitor, and 3D graphics with memory of 4Mb plus. It remained for each company to install additional hardware or software.

The type of machine we received, and its price tag, depended on the type of corporate-cum-business workstation each company was promoting. We expected to receive machines that would fall into one of two categories: workstations that would be used in an office application-intensive environment, or a more graphics-orientated machine. No matter how intensive your computing requirements, there should be something here to suit your needs.

We had told companies that any additional hardware was OK, and we were curious to see what would turn up. As it is highly likely that this sort of machine would be hooked up to a network, we wondered how our outline specification would be interpreted. Most commonly, the machines we review come with extras like modems and storage devices: would either of these prove to be relevant to a networked workstation? Or would we be inundated with PCs that had no more frills than a network card.

These powerful workstations go the distance. Here's how they ran.

## 333MHz PIIs Contents

- 154 Carrera Power Pro II - 333
- 154 Dell Dimension XPS D333
- 157 Elonex PTX-G333/11
- 157 Evesham Vale Platinum
- 158 Gateway 2000 G6-333
- 158 KT Business Plus
- 160 Lexon Technology 702XL
- 160 Linear NT Powerstation
- 161 NEC Dirion SP-333L
- 161 Panrix Fusion 333
- 164 Which processor — all the threes or up Deschutes?
- 168 Removable storage
- 168 Network interface cards
- 172 High-speed memory technology
- 172 High-speed disk technology
- 174 Performance graphs
- 174 How we did the tests
- 174 Be BIOS aware — 300MHz vs 333MHz processors
- 177 **Editor's Choice**
- 180 Table of features

## Ratings

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





### Carrera Power Pro II - 333

**T**he Power Pro looks like a typical corporate workstation. The lockable case is a tall business-like tower with a removable hard-drive tray. This was one of three SCSI-based machines to be submitted to our group test and came fifth in our

benchmark tests, outperformed by two EIDE-based machines. However, if you were to use all three SCSI devices

simultaneously, the performance gain would likely be impressive. There's a 9Gb IBM ultra-wide SCSI hard drive, a 32-speed Toshiba SCSI CD-ROM drive and a 1Gb Iomega Jaz SCSI drive, all connected to the on-board Adaptec SCSI controller. Carrera included a spare 1Gb Jaz disk. Unfortunately for those who may want to use an external SCSI device, no external connector had been fitted as this SCSI controller only supports two channels and both were in use by the devices fitted. If you were not going to use both, it would be possible to have an external SCSI connector fitted.

Installation was smooth, especially with the easy-to-read, user-friendly manual. System administrators will be pleased to find the emergency repair disk in the box, as things can go wrong on even the best of machines. To get inside, you remove two screws and slide the panel off. Cabling was very neat and tidy and there was a lot of space inside, making access for upgrading or maintenance a dream. We were pleased to see the 64Mb of SDRAM occupying

only one of the four DIMM slots. (As this was a single-processor group test, only one of the CPU slots was in use.)

The monitor was an excellent Iiyama Vision450 19in (18in viewable diagonal), TCO 95 and EPA Energy Star compliant. For even the finest images, the Diamondtron aperture-grille CRT monitor was bright and sharp. D-Sub and BNC connectors are available and the on-screen display includes adjustments for colour and colour temperature, horizontal and vertical moiré, and convergence.



#### PCW Details

**Price** £2,931.63 (£2,495 ex VAT)

**Contact** Carrera 0171 830 0486 [www.carrera.co.uk](http://www.carrera.co.uk)

**Good Points** Three internal SCSI devices. Monitor. Lots of upgrade potential.

**Bad Points** Benchmark performance a little slower than we would have liked.

**Conclusion** Ideal graphics-oriented workstation or standalone PC.

**Build Quality** ★★★★★  
**Performance** ★★★★★  
**Value for Money** ★★★★★  
**Overall Rating** ★★★★★

### Dell Dimension XPS D333

**A**lthough the XPS D333 is reasonably priced, it is not the cheapest in our group. Neither is it one of the fastest, coming seventh in our performance benchmark test. Still, this was a solidly-built machine, housing some good components. We were pleased to see three extra Zip disks included in the box, which is a nice, customer-friendly touch. Like all Dell machines, setting up this PC was a piece of cake. The rear is

well labelled and the manuals are helpful. Only one screw secures the case, and this is easily removed using just a thumb and forefinger. The inside is spacious, with stacks of room for future upgrades — handy if you already have components, such as a network card, that you'd prefer to use.

We are always impressed with the huge gold heatsink that Dell uses in its Pentium II PCs. Somehow, you just can't imagine the CPU ever overheating with something like that attached to it.

But just to keep things extra cool, there's also a large fan fitted to the case for internal ventilation. We'd have preferred the 64Mb of SDRAM to have been fitted on one module instead of two, as the setup left just one free DIMM slot for future memory upgrades.

All four of the PCI slots were empty, as were both ISA slots, with sound provided on the Intel motherboard by a Yamaha OPL-3 chipset. Graphics

were powered by an STB Velocity 128 fitted into the AGP connector. The 8.4Gb Maxtor hard drive had been tucked neatly away in the case, leaving a 5.25in bay and a 3.5in bay free, both with external access. There's another free 3.5in bay inside, ready for easy installation of a device such as a second hard drive.

The Dell D1226H 19in monitor has a 17.9in viewable diagonal. It is TCO95 and EPA EnergyStar compliant. In our tests it suffered from a little moiré but otherwise produced excellent images. The focus on this monitor was particularly sharp. We also liked having separate, easily accessible controls for brightness and contrast.



#### PCW Details

**Price** £1,820.08 (£1,549 ex VAT)

**Contact** Dell 0870 1524850 [www.dell.com/uk](http://www.dell.com/uk)

**Good Points** Monitor. Ease of use and installation.

**Bad Points** Limited room for memory upgrades. Performance.

**Conclusion** A good, user-friendly PC.

**Build Quality** ★★★★★  
**Performance** ★★★★★  
**Value for Money** ★★★★★  
**Overall Rating** ★★★★★

## Elonex PTX-G333/II

**T**he reasonably-priced PTX-G333/II from Elonex was one of the slowest machines in the group, just beating Linear in our performance benchmark. Its beige case is the sort of unappealing hardware we prefer to keep hidden under the desk, but the bright-green power LED did add a nice splash of colour. There is a lock on the case, which is good for the security-conscious.

Six screws had to be removed before we could take the lid off. While this was simple enough, getting the

cover back on again took some considerable manoeuvring. The insides were a fine example of tidy housekeeping, with all the cables neatly folded and clipped out of harm's way. Those managers who believe that a work PC is just that, will be pleased to note that this machine has not been fitted with sound capability. This leaves all three ISA slots free. A 3Com network card has been fitted into one of the four PCI slots, with the ATI Xpert@Work using the AGP connector. The graphics card had been fitted with the full 8Mb of RAM.

We were treated to a splash of colour on the Microstar motherboard, provided by the metallic green heat-sink attached to the Intel 440LX chipset. With memory prices so cheap, it would have been nice to have had the 64Mb of SDRAM fitted onto one module instead of two, but it still leaves two DIMM slots available for future upgrades.

No software package was included but there are options available on request, according to a

company's size and requirements. There is a logic to this, since many companies have their own deals with software manufacturers.

The monitor is an Iiyama VisionMaster Pro 17in with a 15.6in viewable diagonal. It is TCO 95 and EPA Energystar compliant. These are generally excellent monitors producing good, stable images that are easy on the eye, and this particular model was no exception. There are BNC and D-SUB connectors available at the rear, which is handy if you want to connect two systems. It has all the controls you need, colour temperature adjustment, manual degauss and horizontal convergence.



### PCW Details

**Price** £1,639.13 (£1,395 ex VAT)

**Contact** Elonex 0181 452 4444  
[www.elonex.co.uk](http://www.elonex.co.uk)

**Good Points** Price. Monitor. Spacious interior.

**Bad Points** Case. No extras. Performance.

No sound.

**Conclusion** Worthy of consideration, but shop around before making a decision.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★

## Evesham Micros - Evesham Vale Platinum

**N**ot all companies are big enough to warrant dedicated IT staff, and the person who has to set up and run a workstation may have little experience of hardware. If so, the Platinum is worthy of consideration.

It's easy to set up and the user manual is informative, well written and illustrated. Performance-wise the Platinum did well, coming in third ahead of two SCSI-based machines; not bad, considering it carries a price tag that's £600 less than the cheapest of the SCSI computers

tested. Housed in a short, stocky case with a lockable front bezel, the insides of this PC are a tribute to good housekeeping. The cables were neatly folded out of the way, and even the power cables had been tidily wrapped.

We were surprised to see a Panasonic DVD-ROM drive installed, as NT4 doesn't offer support for DVD. This means the drive simply operates like a normal 20-speed CD-ROM, which makes sense insofar as future-proofing goes. Evesham is confident that software for running DVD in NT4 will be available by the time you read this. Software support will also be offered in the next version of Windows NT.

To help you run power presentations Evesham has teamed the DVD drive with an ATI All-In-Wonder graphics card offering 3D graphics and DVD MPEG-II video decoding. Disappointingly, the 64Mb of SDRAM had been installed in two of the three DIMM slots, limiting future memory

upgrades. A two-year on-site maintenance warranty applies to this PC.

The Taxan Ergovision 750 17in monitor uses Diamondtron aperture-grille CRT technology. It has TCO 95 and EPA Energy Star ratings. Focus was crisp, and images in the 16in viewable diagonal were sharp. Along with BNC and D-Sub connectors there's a serial interface input connector. The on-screen display offers more controls than any of the other monitors here, and includes adjustments for purity, horizontal and vertical convergence, colour, degauss and moiré.



### PCW Details

**Price** £2,231.33 (£1,899 ex VAT)

**Contact** Evesham Micros 0800 6345999  
[www.evesham.com](http://www.evesham.com)

**Good Points** Performance. Ease of use and installation. Warranty. Monitor. DVD-ROM.

**Bad Points** Limited memory upgradeability. No extras.

**Conclusion** A good, reasonably-priced workstation.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★



## Gateway 2000 G6-333

The good-looking G6-333 has some respectable components which are reflected in the price. Installation was easy, and greatly simplified by Gateway's habit of colour-coding all system connections.

Inside, after the removal of six screws, there was simply stacks of room, as the size of the case would suggest. The first thing to

strike us was that the power cables were in a bit of a mess, although access to

components is not obstructed. A large vent covers the CPU which, along with the huge heatsink, should keep things nice and cool.

Managers wanting a workstation with a lot of internal upgrade potential will love this PC. Two extra brackets are fitted inside for stacking devices like hard drives in blocks of three. With the 8.4Gb Quantum Fireball drive already fitted, there are five free internal 3.5in bays: great for accommodating several additional hard disks in a RAID configuration or for a selection of OSs on separate drives, and handy if you want to work with Windows,

Unix and perhaps a DOS CAD package. If this sounds like your cup of tea, ask Gateway to fit SCSI. There's still room for devices requiring external access, with two forward-facing 5.25in bays free.

Both ISA slots were free, with the Ensoniq sound card fitted into one of the four PCI slots. Graphics are powered by an Accel Graphics

Permedia II with 8Mb of SGRAM, fitted in the AGP slot. For extra storage there's an Iomega Zip drive. Useful little touches include the non-slip pads beneath the keyboard, the inclusion of a Microsoft IntelliMouse and a blank Zip tape included in the box.

The Gateway EV900 19in monitor has an 18in viewable diagonal and TCO92 and EPA Energy Star ratings. The on-screen control display has all the positioning, sizing and geometric controls you need, plus manual degauss and controls for adjusting colour and colour temperature. Focus was not that crisp, but the image quality was good apart from a little moiré.



### PCW Details

**Price** £1,916.43 (£1,631 ex VAT)

**Contact** Gateway 2000; 0800 552000  
[www.gateway2000.co.uk](http://www.gateway2000.co.uk)

**Good Points** Spacious interior. Ease of installation and use.

**Bad Points** Performance. No extras.

**Conclusion** Good, but shop around.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★

## KT Computers - KT Business Plus

An unusually-styled monitor made the Business Plus stand out from the crowd. Also, its price puts it among the less expensive in the group; only Linear and Elonex submitted cheaper PCs. But unlike its budget rivals, keeping the price low did not harm its performance. The Business Plus managed a score in our performance benchmark tests which put it about mid-pack, just behind Carrera's SCSI-based machine; a respectable placing for an EIDE-based PC.

A little more money

could have been spent on the small tower case used to house the system, though. The fact that it is a lighter shade of beige than the floppy-disk drive and 32x Hitachi CD-ROM does little to enhance its looks.

Some guesswork was involved when setting up, as the rear of the system lacks any labelling. The insides were so cramped that the PII was tucked under the PSU, making it difficult to reach. The 64Mb of SDRAM had been installed on two modules, leaving two free DIMM slots for future memory upgrades.

Sound is via an AWE64 sound card occupying one of three ISA slots. A Diamond Viper 330 graphics card occupied the AGP connector, while a 3Com Ethernet card occupied one of four PCI slots.

This particular model is offered with a choice of office suites. The machine we reviewed came with Lotus SmartSuite, but for an additional £120 (plus

VAT) you could opt for Microsoft Office SBE.

The Nokia Multigraph 447Za 17in monitor has a 16in viewable diagonal and carries TCO 95 and EPA EnergyStar ratings. It came with more extras than most offices will need, such as the built-in, front-facing speakers, volume control, mute button and connectors for an external microphone and headphones. The unusual style of the control buttons across the front of the monitor are distinctive: instead of the usual on-screen controls, adjustments are measured by a row of green LED dashes.

Personal  
Computer  
World  
Highly  
Commended



### PCW Details

**Price** £1,737.80 (£1,479 ex VAT)

**Contact** KT Computers 0181 961 8897  
[www.ktcomputers.co.uk](http://www.ktcomputers.co.uk)

**Good Points** Price. Performance.

**Bad Points** Case design. Lack of labelling. Cramped innards.

**Conclusion** A no-frills machine, suited to those on a budget.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★





### Lexon Technology - Lexon 702XL

**T**he 702XL was one of three SCSI-based machines in the group and zipped through our benchmark test into second place. It is one of the most expensive machines here, but boasts components that should keep even the most power-hungry workstation-user happy. Those looking for a PC with lightning-fast 2D graphics will be thrilled with the Matrox Millennium II AGP graphics card and its 16Mb SGRAM. The Adaptec AHA 2940 Ultra 2 SCSI card occupied one of four PCI slots. Both ISA

slots are in use, with a 56Kflex modem and an AWE64 sound card. 64Mb of SDRAM was fitted into one of the four DIMM slots, leaving lots of room for future memory upgrades.

A Seagate Travan EIDE tape drive takes 4Mb tapes (8Mb compressed) and complements the 9.1Gb IBM SCSI hard drive. The SCSI card has no outside connector for external devices like scanners, but our unit was a pre-production model: future cards should offer this feature. We understand from Adaptec that the production 2940 Ultra 2

SCSI card will operate with devices plugged into all its connectors, which is great news for those with plenty of internal and external devices. With only one internal 3.5in bay free, our only gripe is that there's little room for adding more internal devices.

The Natural Keyboard and Intellimouse that accompanied this PC earn Lexon extra points, as does the easy-to-read user guide.

And to make the most of the IBM voice recognition software, Lexon has included a microphone and a headset.

The monitor is an ADI Microscan 6P 19in with an 18in viewable diagonal. It is TCO 95 and EnergyStar compliant. There are four USB plugs at the rear, plus one downstream USB plug for connecting to your PC. There are on-screen controls for degauss, moiré, colour temperature and colour adjustment.



#### PCW Details

**Price** £2,931.63 (£2,495 ex VAT)

**Contact** Lexon 0181 680 6816  
[www.lexonpc.com](http://www.lexonpc.com)

**Good Points** Graphics-card memory. Performance. Ultra 2 SCSI. Tape drive. Keyboard. Upgradable memory.

**Bad Points** No external SCSI connector on pre-production card. Little space for adding extra internal devices.

**Conclusion** A great CAD/CAM/CAE graphics workstation.

- Build Quality** ★★★★★
- Performance** ★★★★★
- Value for Money** ★★★★★
- Overall Rating** ★★★★★

### Linear Computers - Linear NT Powerstation

**D**ue to a last-minute withdrawal, we would have had a gap our group test but for Linear, which rose to the challenge admirably, putting a system together for us in only four days.

There was nothing about the Powerstation to show that it was a rush job. Its use as a workstation is questionable though; it had the feel of a mid-range SME computer. But it's certainly a machine to consider if you're on a tight budget. Do bear in mind that although it has the cheapest price tag in the group, it also came last in our performance benchmark test.

We liked the way the 6.4Gb Maxtor hard drive had been partitioned in two, and assigned the letters C and E, leaving D for the Mitsumi 32-speed CD-ROM. The case used to house the system is quite small, giving the innards a cramped look. Because of the lack of space, the PII is located beneath the PSU, severely restricting access. Linear fitted the 64Mb of SDRAM into two of the three DIMM slots, limiting future expansion of the memory to a single slot.

One of the three ISA slots was vacant, with an AWE64 sound card and 56Kflex modem fitted in the other two. A 10/100 Network card had been

fitted into one of the four available PCI slots. Occupying the AGP slot, the Matrox Millennium II graphics card has 4Mb of SGRAM. Instead of a floppy drive, Linear has installed an LS120 (see

"Removable storage", p168), although no spare LS120 disk accompanied the machine. This left two forward-facing 5.25in bays and one 3.5in bay with external access free. There's also an empty internal 3.5in bay.

The 17in Samsung SyncMaster 700s monitor has a viewable diagonal of 15.7in and MPRII and EPA EnergyStar ratings. Picture quality was good, and we liked the separate dials for contrast and brightness, with separate buttons for degauss and colour temperature adjustment (a consideration if you do a lot of colour matching). Other controls were accessed via an on-screen display and included all the sizing, positioning and geometric adjustments you'd require.



#### PCW Details

**Price** £1,585.08 (£1,349 plus VAT)

**Contact** Linear 0800 622094 (no website)

**Good Points** Price. Setup. Monitor.

**Bad Points** Performance. Cramped interior. Limited memory upgradability.

**Conclusion** Ideal for those on a tight budget.

- Build Quality** ★★★★★
- Performance** ★★★★★
- Value for Money** ★★★★★
- Overall Rating** ★★★★★

## NEC Direction SP-333L

**T**he Direction SP-333L did well in our performance benchmark test, finishing way in front of three SCSI-based PCs. High praise indeed for an EIDE-based machine. Installation was smooth, helped by the quick-start wallchart. However, it was disappointing to find that the Office 97 manuals were in French, and the NEC Utility disks supplied were for Win95, not NT. Things

improved once we got the lid off. The inside was spacious and the cables were neatly tied out of the way.

With no extra devices included, and one forward-facing 5.25in and two forward-facing 3.5in bays vacant, all with external access, there's room for adding bits later. If the 6.4Gb Quantum Fireball 3.5in hard drive isn't enough, there's a bracket already in place for fitting an extra device inside (a second hard drive, say).

As NEC had opted to fit 64Mb of SDRAM into two of the three DIMM slots, future memory upgrades would be limited. The PC has no sound capability, presumably to enhance its image as a serious corporate business machine, but with its speedy performance and ATI Xpert@Work AGP card with 4Mb SGRAM, the temptation to play games instead of working may otherwise have proved too much. A 3Com network card occupied one of four PCI slots.

We were pleased to get an IntelliMouse, and the keyboard is comfortable to use with satisfyingly "punchy" keys. Also included is Office 97 SBE and McAfee Virus Webscan.

The NEC MultiSync E700 17in monitor has a viewable diagonal of 15.6in and is TCO 95 and EPA EnergyStar compliant. As it suffered badly from moiré, we'd have liked a control to correct this. However, the on-screen control display did include adjustments for colour and colour temperature. Colour registration was a little out, which could have accounted for the colour fringes on images. This was especially hard on the eyes when reading text.



### PCW Details

**Price** £1,974 (£1,680 ex VAT)

**Contact** NEC Direct 01706 362811  
[www.necdirect-europe.com](http://www.necdirect-europe.com)

**Good Points** Performance. Software package.

**Bad Points** Monitor. Limited memory upgradability.

**Conclusion** Will suit users for whom performance is the prime requirement.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★

## Panrix Fusion 333

**T**he SCSI-based Fusion 333 wasn't quite the racy little number we had expected it to be. Although it came fourth in our performance benchmark test, it was left behind by two EIDE-based PCs.

At first we were unable to use the floppy drive on this machine, so we removed the casing and checked the connectors but they seemed to be OK. Something must have done the trick, though, as the drive worked next time

around. We had to remove the casing anyway, to get at the Sleep button which disappeared inside the case when pushed. The power button also failed to work. It was easy enough to remove the power cable, but it was annoying, especially as this is the most expensive PC in the group.

Once we'd had a look at the inside, we were impressed. A large internal fan had been fitted to keep the interior cool. The Asus P2L97DS is a dual-processor motherboard, but for the purposes of our group test only

one processor had been fitted. We were happy with the amount of room for future memory upgrades: the 64Mb of SDRAM took up only one of the four DIMM slots. All three of the internal devices — the 9Gb IBM hard drive, the Plextor 34-speed CD-ROM and the Iomega Zip drive — use the on-board Adaptec SCSI controller. Panrix has

made the most of having the SCSI controller on the motherboard, by daisy-chaining the hard drive with an external connector fitted to the case: handy for external SCSI devices.

The Iiyama Vision Master Pro 17in monitor has a 15.6in viewable diagonal. It is TCO 95 and EPA EnergyStar compliant. This excellent monitor produces good, stable images which are easy on the eye. There were BNC connectors at the rear, which is handy if you want to connect up to two systems. The controls included colour temperature adjustment, manual degauss and horizontal convergence.



### PCW Details

**Price** £3,284.13 (£2,795 plus VAT)

**Contact** Panrix 0113 244 4958 [www.panrix.com](http://www.panrix.com)

**Good Points** Stacks of upgrade potential. External SCSI connector.

**Bad Points** Problems with power and sleep buttons. Not as fast as expected.

**Conclusion** A good configuration let down by minor build problems.

**Build Quality** ★★★★★

**Performance** ★★★★★

**Value for Money** ★★★★★

**Overall Rating** ★★★★★



## The PII 333MHz processor and how it differs from previous Pentiums

**T**oday's workstations are continually asked to perform processor-intensive tasks, and are used as performance engines to drive image and data-rich applications in a whole raft of graphics-based industries, from CAD/CAM engineering to the manipulation of textured 3D images.

We asked that all the workstations in our group test should be fitted with single Pentium II 333 processors, although high-end workstations used in areas like computer graphics imaging are usually fitted with dual-333 processors to cope with the workload.

Launched in January '98, the PII 333MHz may appear to be just another processor running slightly faster than its predecessor. But there are a few key differences between it and previous Pentium IIs. The PII 333 is, in fact, the first of a new Pentium II product line, formerly codenamed Deschutes.

### Deschutes: the difference

The new Deschutes processors contain the same basic features as previous Pentium II processors, including the Dual Independent Bus architecture which enables the CPU to use the L2 cache bus and the system bus simultaneously, as well as Dynamic Execution, MMX technology and the 512Kb Level 2 (L2) cache which runs at half the speed of the processor.

Although similar on the outside to the earlier Klamath 233, 266 and 300MHz PIIIs, there is a single important difference in terms of Deschutes micro-architecture. Previous PII chips were manufactured using Intel's 0.35-micron process, but the new Deschutes chips are the first to use the 0.25-micron process. (To put this into perspective, a single human hair is approximately 400 times thicker than 0.25 microns.)

By decreasing the size of the die cut from the silicon wafer, Intel benefits in three ways. Firstly, it can produce more processors from a single wafer. Secondly, the distances travelled by the electrons on the chip shrink, in turn increasing the overall speed of the processor. The first Deschutes processor is the 333MHz version group-tested here, but the 0.25-micron process can support 350 and 400MHz speeds. (See page 212 for our profile of four of the first lightning-fast 400MHz PCs on the market.)

Finally, the voltage necessary to drive current through the features on the chip is reduced as those features are brought closer together. Running at 2.0v, the new Deschutes processors consume much less power, in turn generating less heat compared to previous Klamath PIIIs running at 2.8v. The old PIIIs typically consumed 32W at 300MHz, compared to Deschutes' consumption of little more than 15W at 333MHz.

### System performance

The PC industry measures system performance with benchmarks which calculate floating-point, integer and multimedia performance. Intel's figures claim that on standard office applications the 333MHz Pentium II processor delivers up to a ten percent increase in performance over a 300MHz Pentium II processor, with a SPECint



Intel's PII 333MHz processor with the slide out NLX motherboard

rating of 12.8, a SPECfp rating of 9.14 and a Norton Multimedia Benchmark rating of 28.8.

There is, however, one other very important fact about the Deschutes product line. It may have the same size Level 2 cache as the Klamaths, but has two memory chips rather than the previous four. This cuts down production costs but also affects performance if your BIOS isn't aware. Rather than the anticipated ten percent increase, you may only be looking at around four percent.

### BX and LX boards

All BX boards (see "Replace or upgrade?") are said to have Deschutes-savvy BIOS chips but the LX boards may need to be updated. Make sure your supplier has updated the BIOS if you don't fancy downloading an update and flashing it yourself. Check the BIOS boxout on page 174 for our results.

Although the PII 333 was the first to usher in the new die size which Intel has also used to produce the latest 350 and 400MHz PII processors, it is the last CPU designed specifically for Intel's LX chipset. The LX was launched in August last year and was the first chipset to integrate Intel's new Slot 1 technology and its Accelerated Graphics Port (AGP).

Intel considers the Slot 1 PII and potential of AGP to be the basic components of what it describes in typical buzzword terminology as "visual computing". This essentially encompasses all image-based software — specifically, 3D-rich applications used in CGI and CAD/CAM engineering, as well as technology like DVD video decoding in software which really gives the processor a workout.

The new PII processors are designed for Intel's BX chipset which has a number of

advantages over the LX. Its system-bus speed has been increased by 50 percent to 100MHz, compared to the LX's 66MHz, and the BX can utilise up to a gigabyte of main memory rather than the 512Mb limit of the LX. Both chipsets can cache up to the full 512Mb RAM.

The faster bus speed is an advantage, of course, but a 50 percent increase isn't that sensational when you consider Intel doubled the bus speed from 33 to 66MHz when the market switched from the 486 to the Pentium. Note that only the 350 and 400MHz PIIIs will be able to make use of the BX boards running at 100MHz; the 333MHz will only run at 66MHz externally whether in a BX or LX board.

### Replace or upgrade?

There will be the inevitable move amongst the high-end market to embrace the new processors and Intel is expecting a large percentage of OEMs to ship the new processors with the LX motherboards, as well as with the BX. This will mean, though, that to enjoy the advantages of the quicker bus speed you will need to upgrade both processor and motherboard, in effect buying a whole new machine.

No other industry falls its champions as young as the PC industry, and Intel is claiming that a PII 400 on a BX motherboard represents "up to a 20 percent performance boost" over a PII 333 using the LX motherboard. With the prospect of late 1998 Slot 2 technology looming and all the upgrading that will entail, some high-end corporate buyers might choose to opt for the cheaper 333s which can replace processors on existing LX motherboards, rather than upgrade to new machines.

Paul Trueman



## Removable storage

**A**lthough removable storage devices are fast becoming a standard feature on PCs, there is such a diverse range that it is difficult for manufacturers to decide what to include.

### LS120 or Zip

Of all the systems in this group test, only one came supplied with an LS120. Although performance is its weakest point, the LS120's main aim is to replace the ageing floppy disk, so you can forgive its slow pace. It is backwards compatible with 720Kb and 1.44Mb disks, and the LS120 disks provide a useful 120Mb of storage. If the system's BIOS is compatible, the LS120 can be used to boot a PC.

Many readers will be familiar with Iomega's Zip drive. Its inclusion in four of the systems here illustrates its popularity. The ZIP disks hold up to 100Mb and are ideal for storing large files or transferring them across PCs. However, like the LS120, performance limits its usefulness and capacity is too low to make it suitable for tasks such as regular backup.

### All that Jaz

If you're looking for near hard disk performance from your removable media, then Iomega's Jaz drive is the ideal choice.

The latest drives offer a whopping 2Gb of storage on a single cartridge. They have the power to run applications locally, and



**Tape is the sensible choice for backup as it offers far higher capacities**

over the past year; most PCs come with nothing less than 6Gb.

The Seagate STT8000A drive supplied with the Lexon system uses Travan TR-4 data cartridges which can pack in up to 8Gb of data, allowing you to complete a full backup of your hard disk on a single tape.

easily handle graphics-intensive tasks such as multimedia presentations.

### Who's got it taped?

Only one contributor to this group test considered a tape drive a suitable component. Although removable storage is pushed hard as a candidate for backup, tape is still the only sensible choice as it offers far higher capacities and lower overall storage costs. Furthermore, the storage space on the average hard disk has increased dramatically

### On a network

The fact that a corporate workstation is usually attached to a network can make the removable storage device completely unnecessary. The primary function of networks is for information sharing, so unless staff have a need to transfer data to remote systems such as their PC at home, it may be worth cutting overall costs and keeping removable storage out of the equation.

**Dave Mitchell**

## Network Interface Cards

**I**t's a rare occurrence nowadays to buy a corporate workstation and not have it connected to the company network. As a result, an increasing number of PC vendors are including network cards as part of the basic computer specification — as did four of the manufacturers in this group test. Two installed 3Com Ethernet cards, while one opted for an Intel Network 10/100 card. The remaining one chose an unbranded 10/100 card.

Taking things even further, most of Intel's motherboards now have network connectors integrated. As with anything in the computer market, however, this isn't the end of it; there's more to it than just having a network connector.

For the majority of networks, a standard 10Mb network connection will be sufficient. However, as applications become increasingly powerful and complex, and the data we are creating becomes bigger, this basic network architecture will soon grind to a halt. Upgrading the backbone will alleviate the bandwidth problem to a certain extent, but upgrading the user's network connection can also help.

Unfortunately, to go to every machine on your network and replace the current 10Mb card with a Fast Ethernet card (offering 100Mb connection) is not a task to which many people would look forward: depending on the number of cards to be

replaced, this could take days or merely be too impractical.

### Slow and fast cards

One thing to look out for when choosing a network card is one that can work at both 10Mb and 100Mb network speeds. Deploying these throughout the network provides users with a standard 10Mb connection and then, as your network bandwidth requirements increase, the network cards can easily be switched over to the faster 100Mb connection. In the majority of cases this

just entails a software change, providing a simple upgrade path while protecting your initial investment.

### Wake on LAN

Another important feature to look out for is support for "Wake on LAN". Developed initially by AMD (known then as Magic Packet Technology), Wake on LAN is the ability to remotely boot a PC from across the network, even if that PC has been fully powered down. It is primarily targeted at remote PC management in conjunction with DMI and

other desktop management tools like Hewlett-Packard's TopTools. This feature is prominent at present among network connections integrated onto the motherboard, as they require an additional connection to the power supply. However, NIC vendors, including Intel and 3Com, should soon be announcing expansion boards with Wake on LAN functionality.

**Alan Clark**



## High-speed memory technology

**A**s CPU (central processing unit) speeds progress past 300MHz, so DRAM (dynamic RAM) is unable to keep up with the demands of the processor. All the PCs in this group test used SDRAM (Synchronous DRAM).

SDRAM technology uses a clock to synchronise signal input and output on a memory chip. This RAM clock is co-ordinated with the CPU clock so the memory and microprocessor are in sync, allowing the processor to perform other operations without waiting for the memory to locate the address and read or write the data. The result is increased speed and higher bandwidth performance, as SDRAM technology allows two pages of memory to be opened simultaneously. Effectively, synchronisation reduces the time it takes to execute commands and transmit data.

As well as performance, SDRAM has other advantages. It is beneficial for multitasking, particularly in memory-intensive networking environments because of the double memory on the chips (SDRAM is designed with two internal memory banks).

Like most of today's PCs, all the machines reviewed here run the system bus at 66MHz. At this speed, SDRAM offers a modest five to ten percent speed boost over the somewhat cheaper EDO RAM.

The imminent introduction of the 100MHz bus will allow SDRAM to shine. It is estimated

that SDRAM could double the memory performance seen with DRAM today. SDRAM will provide incremental performance gains up to 200MHz, at which time, manufacturers say, another new type of memory must take over.

There's a "multiplier ceiling" factor of 3x between processor and bus clock speeds. If we are to have ever-faster processors, then the bus speed can't really fall much below one-third of the CPU clock without starving the CPU of data. It's inevitable that bus speed and memory speed have to increase to keep pace with the new breed of processors. The forthcoming Intel BX chipset will be the first to support bus speeds in excess of 66MHz.

### The future

What can we expect for the future? First in the queue is a version of SDRAM called DDR, short for Double Data Rate. This is still based on the SDRAM architecture but enables data transfer on both edges of the "clock", allowing DDR to achieve 200MHz bus speeds.

Further down the road is SyncLink DRAM (SLDRAM), which builds on the features of both DDR and SDRAM for a synchronous link.



A 168-pin SDRAM memory module

SLDRAM is being touted as an alternative to proprietary, licensed, RDRAM architecture of Rambus, which eventually promises 800MHz bus speeds.

SLDRAM improves on SDRAM by offering a higher bus speed and using packets to take care of address requests, timing and commands to the DRAM. The result is less reliance on improvements in DRAM chip design and, ideally, a lower-cost solution for high-performance memory. In the meantime, Intel is proposing a halfway house solution: synchronous DRAMs on a 100MHz or 133MHz Rambus module (RIMM), effectively making SDRAMs mimic the Rambus architecture.

Roger Gann

## High-speed disk technology

**T**wo high-speed disk interface technologies were used in the Windows NT 4.0 Workstations we tested: Ultra DMA and Ultra SCSI.

### Ultra DMA

Ultra DMA, also known as Ultra-ATA or Ultra-DMA/33, is the latest advancement to the ATA specifications, ATA-4. The standard was developed jointly by Quantum and Intel and was first supported by the TX chipset.

Put simply, Ultra-DMA doubles the maximum transfer speed of the previous ATA-3 standard, from 16.6Mb/sec to 33Mb/sec. It

does this without increasing the cycle time of the ATA bus clock over the rate currently used for PIO Mode 4 and DMA 2 (the previously fastest modes). As such, its performance is comparable with Ultra Wide SCSI but it's much cheaper. This speed gain is achieved by improving timing windows in the protocol on the ATA bus, reducing propagation delays by pipelining data transfers and transferring data in synchronous or strobed mode. Note, though, that the 33Mb/sec rate is a burst-mode rate: real-world performance gain over PIO Mode 4 is as low as five percent.

As well as improved throughput, Ultra

DMA improves data integrity by using a Cyclic Redundancy Check to flag any data transfer errors which may be made over the ATA bus. Equally important are the gains made in reduced host bus/CPU utilisation, virtually halving CPU utilisation compared to PIO Mode 4 when performing write operations.

### Ultra SCSI

For serious, heavy-duty multitasking disk chores, SCSI has long been the

preferred storage solution. It is a mature technology: the original throughput was doubled to 10Mb/sec with the advent of Fast SCSI-2 (this was over the original, 8-bit bus); by increasing this to 16 bits, Fast Wide SCSI was able to double Fast SCSI's transfer speed to 20Mb/sec.

Ultra Wide SCSI, the latest advance in parallel-bus design, further increased the speed of the SCSI bus to a maximum of 40Mb/sec. However, each increase in transfer speed was accompanied by a reduction in cable and bus length and an increase in signal complexity.

Just recently, Ultra2 SCSI was announced by Adaptec and Seagate. The new SCSI standard offers unprecedented throughputs of 40-80Mb/sec. With Ultra2 SCSI, many of the old SCSI restrictions, such as the short cable and bus length, are banished. And for high-speed network servers, there may be no faster method of data delivery.

Very high-end workstations, such as the HP Kayak, make use of RAID 0 striping techniques so as to be able to write simultaneously to a pair of Ultra Wide SCSI drives, achieving throughput gains as high as 75 percent compared to single-drive configurations. Such workstations are equipped with a RAIDport PCI slot extension capable of taking the Adaptec RAIDport Option, the ARO-1130.

Roger Gann



Adaptec makes a range of good-quality SCSI cards



## BAPCo Windows NT 4.0 test results

Manufacturer	Product	200	220	240	260	280	300	320	340	360	380	400	Totals
<b>BIGGER IS BETTER</b>													
<b>NEC</b>	<b>Direction SP-333L</b>												<b>344</b>
<b>Lexon</b>	<b>Lexon 702XL</b>												<b>309</b>
<b>Evesham</b>	<b>Vale Platinum</b>												<b>292</b>
<b>Panrix</b>	<b>Fusion 333</b>												<b>290</b>
<b>Carrera</b>	<b>PowerPro II - 333</b>												<b>287</b>
<b>KT Computers</b>	<b>Business Plus</b>												<b>284</b>
<b>Dell</b>	<b>Dimension XPS D-333</b>												<b>282</b>
<b>Gateway</b>	<b>G6-333</b>												<b>279</b>
<b>Elonex</b>	<b>PTX-G333/II</b>												<b>279</b>
<b>Linear</b>	<b>NT Powerstation</b>												<b>272</b>

### How we did the tests



**D**ifferent applications reflect different aspects of a PC's performance, so it is important to use an appropriate benchmark test. Here, we used the SysMark performance benchmark test to put all ten PCs through their paces. This test is provided by BAPCo (Business Applications Performance Corporation), an organisation which specialises in designing tests based on real-world applications. Its members include many "heavyweight" IT companies including Apricot Computers, Compaq, Dell, Gateway 2000, Hewlett-Packard, IBM, Intel, Lotus,

Microsoft, Motorola, Digital Equipment and Texas Instruments.

BAPCo operates on a non-profit basis with a mission to develop the best objective performance benchmarks for PCs. The tests measure the speed of a computer running a particular OS. In our group test, we used the SysMark NT benchmark which measures system performance under Windows NT.

Eight popular applications were used: Word 7, Lotus WordPro 96, Excel 7, Borland Paradox 7, CorelDraw 6, Lotus Freelance Graphics 96, PowerPoint 7 and Adobe

PageMaker 6. In each application, the time taken to perform a variety of tasks is measured. To get a fully-rounded picture of a PC's performance, and to eliminate the possibility of spurious results, SysMark runs through each application three times. As the benchmark score is based on best-selling business software packages, the result given is a genuine reflection of how the PC will perform in actual day-to-day use.

In addition to testing the speed of the PCs, we also verified the components used and checked out the computer's build.

### Be BIOS-aware: 300MHz vs 333MHz processors

**W**e decided to pitch the Deschutes PII 333MHz and the 300MHz PII processors head to head, to assess the performance gain of the former over its predecessor. The results were not encouraging (see graph, right). If you're after the fastest processor available, go for the 333MHz — but assess your needs carefully. Future versions of the Deschutes (350 and 400MHz) will run on the new BX chipset at the much faster 100MHz external bus speed.

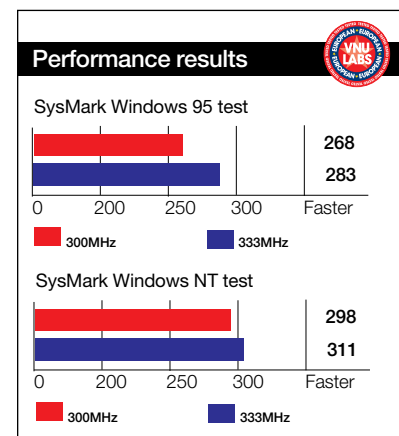
Mathematically speaking, the 333MHz processor should be ten percent faster than the 300MHz CPU. But in the real world, fitted to a motherboard with other components such as add-in cards, we saw that theoretical performance gain drop off.

We benchmarked a 300MHz and a 333MHz CPU in identical machines. Bearing in mind that the results reflect just the performance of a single chip in one machine, the scores were still disappointing. Under the Windows NT version of our SysMark bench-

test, the 333MHz CPU was only 5.5 percent faster than its predecessor, while under the Win95 version of SysMark it emerged only 4.4 percent faster. Also, it's vital that your PC's BIOS is aware of the different way in which the Deschutes CPU accesses its L2 cache memory. If the BIOS is not Deschutes-aware, then the performance gain may be negligible. It is difficult to ascertain whether a BIOS is Deschutes aware, and you often have to rely on the say-so of the PC's manufacturer. Nearly all the PCs we see at PCW use BIOS developed by one of three companies: AMI, Phoenix, or Award. However, as the BIOS is bought by board manufacturers as source code, there isn't always a specific version number to check against.

BIOS source code purchased since Intel began shipping the 333MHz processor is claimed to be Deschutes-aware. Also, all BX boards are said to have Deschutes-aware BIOSes. Consequently, the problem only seems to affect 333MHz processors in current

LX boards (such as those tested here). If you discover yours is not Deschutes-aware, you should look into downloading an upgrade and "flashing" your BIOS up to date.





## Editor's Choice

This group test was unusual in that we did not specify a price guide around which manufacturers could base their PC's configuration. Instead, we decided to make it much harder for them, specifying only that the PC should have a 333MHz processor backed up by 64Mb of memory. Then we sat back and waited to see what would roll in.

A quick perusal of our reviews will have revealed that the computers we received fell into two I/O camps: three machines were SCSI-based, while the other seven opted to use EIDE with hard drives utilising Ultra DMA. This resulted in a firm price difference, with the SCSI machines costing around £3,000 (inc VAT) and the EIDE-based machines carrying more modest price-tags of between £1,600 and £2,200 (inc VAT).

Of the three SCSI machines submitted, Panrix had the most elegant setup. Making the most of the on-board SCSI controller's abilities, Panrix had managed to maximise the usage of both SCSI channels by daisy-chaining an external SCSI connector to the same channel used by the hard drive. This meant you could easily connect external SCSI devices such as scanners or removable storage drives.

We asked for machines to be supplied with a 3D-capable graphics card, and all manufacturers opted to install their cards in the AGP slot; a sensible choice, as there's no premium involved in choosing an AGP card over a PCI card. AGP might be great for 3D gameplay, especially with its dedicated 66MHz bus speed and ability to handle loads of texture memory, but these special features can be put to even better use in the office or studio.

Powerful workstations such as those reviewed here, backed up by decent 3D graphics cards and fast, large hard-disk drives, are perfect for high-end office applications and can cope with virtually all the non-professional

graphics and design packages on the market.

Panrix deserves particular praise for installing a Diamond Fire GL AGP card with 8Mb of SGRAM. This has been teamed with an Iiyama VisionMaster Pro 17in monitor (which was also the monitor of choice for Elonex). Although we'd normally recommend a bigger monitor for graphics-intensive work, this particular display is based on Diamondtron aperture-grille technology and produces sharp, vibrant images. It also won a Highly Commended award in our recent high-end 17in monitor group test (*PCW, April '98*).

Evesham Micros gets a special mention for future-proofing its PC with a DVD-ROM drive. For now, this will only operate as a CD-ROM drive, but NT 4 software support for DVD should be on its way soon (alternatively, wait for Windows NT 5 to arrive). The ATI All-In-Wonder graphics card used by Evesham

Personal  
Computer  
World  
Editor's  
Choice

Left The  
Carrera  
Power  
Pro II

offers software MPEG support which will eliminate the need for a separate decoder card once the DVD is operational under Windows NT. The All-In-Wonder has similar features, and benchmark scores, to the ATI Xpert@Play. The first of our **Highly Commended** awards goes to **KT Computers** for its **KT Business Plus**. It's a good buy for those on a






budget, and KT has managed to strike a balance between build quality, performance and price. Although the machine doesn't come with additional storage, KT did include a 3Com 10/100 network card and Lotus SmartSuite.

Our second **Highly Commended** award goes to **Lexon Technology**. The **702XL** carried a reasonable price tag, included some excellent components, and performed well.







When it came to our **Editor's Choice**, the **Power Pro II** from **Carrera** was an obvious winner. While it wasn't the fastest SCSI-based machine, it was solidly built. As a workstation it's a good all-rounder, offering power performance for use as a high-end workstation or for running numerous office-intensive applications. Best of all, there's plenty of scope for future upgrades, which will lengthen the life of this machine and make it a good choice if total cost of ownership is of paramount importance. ■

Below Our two Highly Commended machines: the KT Business Plus (left) and the Lexon 702XL (right)

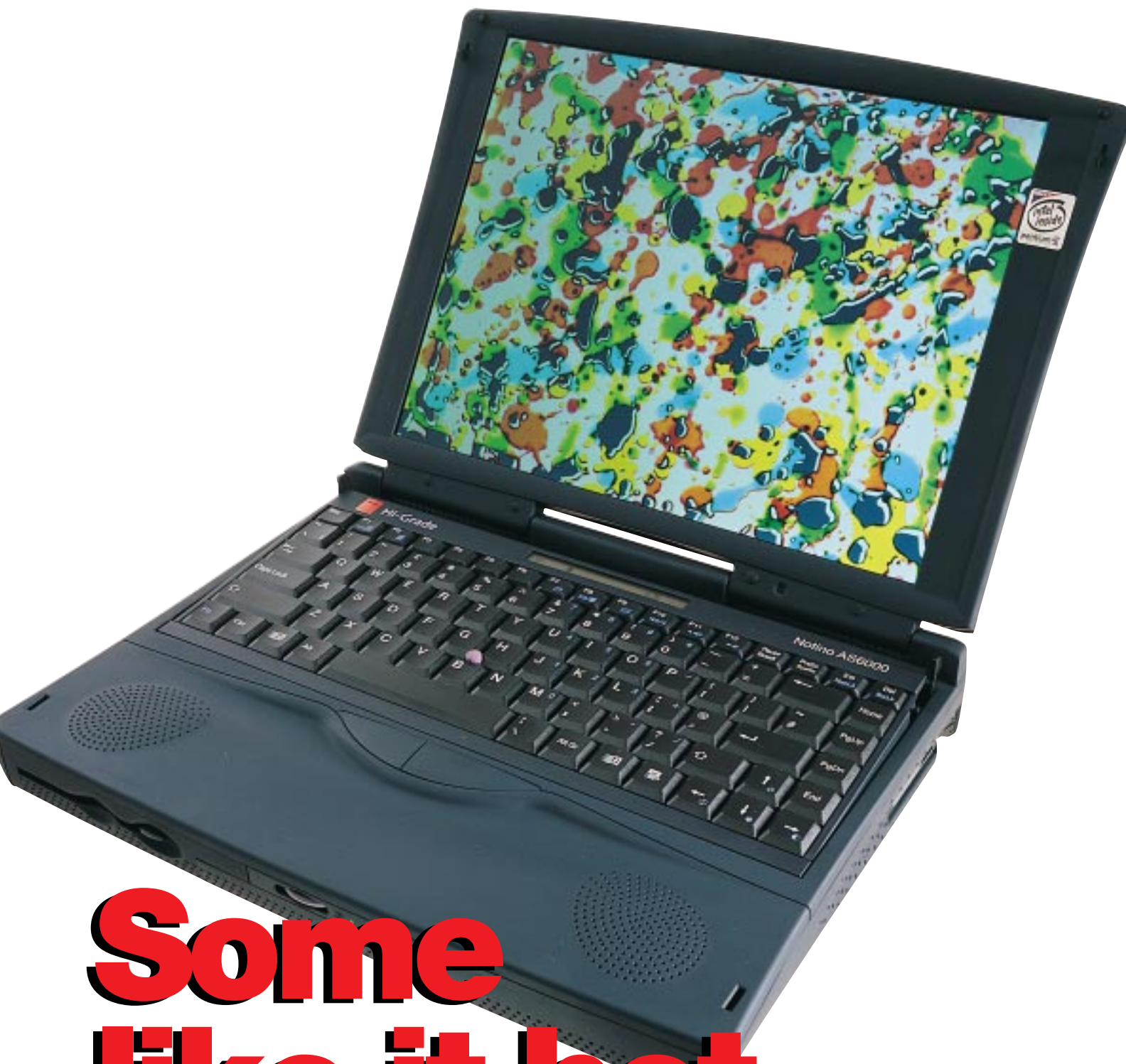


Table of Features					
					
    					
Manufacturer	Carrera	Dell	Elonex	Evesham Micros	Gateway 2000
Model Name	Power Pro II - 333	Dimension XPS D333	PTX-G333/II	Evesham Vale Platinum	G6-333
Price (ex VAT)	£2,495	£1,549	£1,395	£1,899	£1,631
Price (inc VAT)	£2,931.63	£1,820.08	£1,639.13	£2,231.33	£1,916.43
Telephone	0171 830 0486	0870 1524850	0181 452 4444	0800 6345999	0800 552000
Fax	0171 299 6600	01344 723699	0181 452 6422	01386 765954	00353 1 848 2022
Sales hours	9-6 Mon-Fri; 9-5 Sat	8-8 Mon-Fri; 10-4 Sat	9-5 Mon-Sat	9-7 Mon-Fri; 9-5.30 Sat	8-10pm Mon-Sat
Web address	<a href="http://www.carrera.co.uk">www.carrera.co.uk</a>	<a href="http://www.dell.com/uk">www.dell.com/uk</a>	<a href="http://www.elonex.co.uk">www.elonex.co.uk</a>	<a href="http://www.evesham.com">www.evesham.com</a>	<a href="http://www.gateway2000.co.uk">www.gateway2000.co.uk</a>
Standard warranty	1yr RTB / 3yrs labour	1 yr RTB	1yr on-site	2yr on-site	1yr on-site / 2yrs RTB
Warranty options	3 yrs on-site	3 yrs on-site	up to 5yrs	3yr on-site	3 yrs on-site
Technical support	9-6 Mon-Fri; 9-5 Sat	8-8 Mon-Fri	8-8 Mon-Fri; 9-1 Sat	9-5.30 Mon-Fri; 9-3 Sat	8-10pm Mon-Sat
<b>Hardware spec</b>					
Processor	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz
RAM type	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM
Hard disk	IBM	Maxtor DiamondMax	IBM	Quantum	IBM
Size(Gb) / interface	9Gb UW SCSI	8.4Gb EIDE UDMA	8.5Gb EIDE UDMA	8.4Gb EIDE UDMA	8.4Gb EIDE UDMA
<b>Motherboard components</b>					
Motherboard manufacturer	Supermicro	Intel	Microstar	Chaintech	Intel
Chipset	Intel 440LX	Intel 440LX	Intel 440LX	Intel 440LX	Intel 440LX
L2 cache	512Kb	512Kb	512Kb	512Kb	512Kb
<b>Expansion and I/O</b>					
Spare bays 3.5in / 5.25in	2 x 3.5in	2 x 3.5in / 1 x 5.25in	2 x 3.5in / 2 x 5.25in	2 x 3.5in / 2 x 5.25in	5 x 3.5in / 3 x 5.25in
PCI slots / ISA slots / shared slots	4 PCI / 3 ISA / 1 shared	4PCI / 2ISA / 1shared	4 PCI / 3 ISA / 1 shared	4 PCI / 3 ISA / 1 shared	4 PCI / 2 ISA / 1 shared
USB / serial / parallel / PS2	2USB/2S/1P/2 PS2	2 USB / 1 S / 1 P / 2 PS2	2USB/2S/1P/2 PS2	2USB/2S/1P/2 PS2	2USB/2S/1P/2 PS2
<b>Multimedia</b>					
CD-ROM manufacturer	Toshiba	NEC	Veugo	Panasonic DVD-ROM x2	Mitsumi
CD-ROM speed / interface	32x SCSI	14-32x EIDE	32x	20x EIDE	13-32x EIDE
Sound card manufacturer	Pine	Yamaha	○	Creative Labs	Ensoniq
Sound card model	S3 Vibes 3D	OPL3 / 4	○	AWE 64	Audio PCI
Speakers	Altec Lansing	○	○	Multimedia Labs Tc1680	Boston Acoustic Media
<b>Graphics &amp; monitor</b>					
Graphics card	Matrox Millenium II	STB Velocity 128	ATI Xpert@Work	ATI All-in-Wonder	Accel Graphics Permedia3
Bus type	AGP	AGP	AGP	AGP	AGP
RAM / max RAM / type	8Mb / 8Mb / SGRAM	4Mb / 4Mb / WRAM	8Mb / 8Mb / SGRAM	8Mb / 8Mb / SGRAM	8Mb / 8Mb / SGRAM
Monitor model	Iiyama VisionMaster 450	Dell D1226H	Iiyama VisionMaster	Taxan 750	Gateway EV900
Monitor size / viewable area	19in / 18in	19in / 17.9in	17in / 15.6in	17in / 16in	19in / 18in
Max refresh rate	120Hz	85Hz	107Hz	130Hz	75Hz
at 1,024 x 768 (NI)					
Emissions compliance	TCO 95	TCO 95	TCO 95	TCO 95	TCO 92
<b>Other information</b>					
Modem speed (Kbps)	n/a	n/a	n/a	n/a	n/a
Other extras	Iomega Jaz Drive Intel 10/100 network card	Iomega Zip Drive	○	○	○
Office suite	○	Office 97 SBE	○	○	Office 97 SBE
Other software		Dell DMI			
Annual company turnover	£15 million	\$12.3 billion	n/a	£56 million	n/a
Number of employees	85	2,300 (UK & Ireland)	n/a	270	n/a

Key: ● Yes ○ No

Table of Features					
					
					
Manufacturer	<b>KT Computers</b>	<b>Lexon Technology</b>	<b>Linear Computers</b>	<b>NEC Direct</b>	<b>Panrix</b>
Model Name	<b>KT Business Plus</b>	<b>Lexon 702XL</b>	<b>NT Powerstation</b>	<b>Direction SP-333L</b>	<b>Fusion 333</b>
Price (ex VAT)	£1,479	£2,495	£1,349	£1,680	£2,795
Price (inc VAT)	£1,737.80	£2,931.63	£1,585.08	£1,974	£3,284.13
Telephone	0181 961 8897	0181 680 6816	0800 622 094	01706 362811	01132 444958
Fax	0181 961 7498	0181 667 1134	0181 641 8862	01705 629472	01132 444962
Sales hours	9-8 Mon-Fri; 10-5 Sat	9-6 Mon-Fri	9-7 Mon-Fri; 9-2 Sat	8-7 Mon-Fri	9.30-5 Mon-Fri; 10-4 Sat
Web address	<a href="http://www.ktcomputers.co.uk">www.ktcomputers.co.uk</a>	<a href="http://www.lexonpc.com">www.lexonpc.com</a>	n/a	<a href="http://www.necdirect-europe.com">www.necdirect-europe.com</a>	<a href="http://www.panrix.com">www.panrix.com</a>
Standard warranty	1yr RTB / 5yrs labour	2yrs RTB	5yrs RTB	1 yr on-site	1 yr on-site
Warranty options	up to 5 yrs on-site	1-3 yrs on-site	n/a	2 yrs	3 yrs on-site
Technical support	9-6 Mon-Fri; 10-5 Sat	10-5 Mon-Fri	9-7 Mon-Fri; 9-2 Sat	8-8 Mon-Fri	9.30-5 Mon-Fri; 10-4 Sat
<b>Hardware spec</b>					
Processor	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz	Pentium II - 333MHz
RAM type	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM	64Mb SDRAM
Hard disk	Seagate	IBM	Maxtor DiamondMax	Quantum Fireball	IBM
Size(Gb) / interface	9Gb EIDE UDMA	9.1Gb UW SCSI	6.4Gb EIDE UDMA	6.4Gb EIDE UDMA	9Gb SCSI-3
<b>Motherboard components</b>					
Motherboard manufacturer	Soltek	Abit	Biostar	Intel	ASUS
Chipset	Intel 440LX	Intel 440LX	Intel 440LX	Intel 440LX	Intel 440LX
L2 cache	512Kb	512Kb	512Kb	512Kb	512Kb
<b>Expansion and I/O</b>					
Spare bays 3.5in / 5.25in	1 x 3.5in / 2 x 5.25in	1 x 3.5in	2 x 3.5in / 2 x 5.25in	2 x 3.5in / 1 x 5.25in	2 x 5.25in
PCI slots / ISA slots / shared slots	4 PCI / 3 ISA / 1 shared	4 PCI / 3 ISA / 1 shared	4 PCI / 3 ISA / 1 shared	4 PCI / 2 ISA / 1 shared	4 PCI / 2 ISA / 1 shared
USB / serial / parallel / PS2	2 USB / 2 S / 1 P / 2 PS2	2 USB / 2 S / 1 P / 2 PS2	2 USB / 2S / 1P / 2PS2	2 USB / 2 S / 1 P / 2 PS2	2 USB / 2 S / 1 P / 2 PS2
<b>Multimedia</b>					
CD-ROM manufacturer	Hitachi	Creative	Mitsumi	Sony	Plextor
CD-ROM speed / interface	32x EIDE	24x EIDE	32x EIDE	32x EIDE	34x SCSI
Sound card manufacturer	Creative Labs	Creative Labs	Creative Labs	○	Creative Labs
Sound card model	AWE 64	AWE 64	AWE 64	○	AWE 64
Speakers	(built-in to monitor)	80W	SP96S	○	Yamaha M20
<b>Graphics &amp; monitor</b>					
Graphics card	Diamond Viper 330	Matrox Millenium II	Matrox Millenium II	ATI Xpert@Work	Diamond Fire GL
Bus type	AGP	AGP	AGP	AGP	AGP
RAM / max RAM / type	4Mb / 8Mb / SGRAM	16Mb / 16Mb / SGRAM	4Mb / 8Mb / SGRAM	8Mb / 8Mb / SGRAM	8Mb / 8Mb / SGRAM
Monitor model	Nokia 447ZA	ADI Microscan 6P	Samsung Syncmaster 700s	NEC E700	Iiyama VisionMaster Pro
Monitor size / viewable area	17in / 16in	19in / 18in	17in / 15.7in	17in / 15.6in	17in / 15.6in
Max refresh rate at 1,024 x 768 (NI)	75Hz	100Hz	85Hz	75Hz	107Hz
Emissions compliance	TCO 95	TCO 95	MPR II	TCO 95	TCO 95
<b>Other information</b>					
Modem speed (Kbps)	n/a	K56flex	K56flex	n/a	K56flex
Other extras	3Com network card	Seagate Travan 4/8 Adaptec Ultra2 SCSI controller 3Com network card	LS120 drive unbranded 10 / 100 network card	3Com network card	Iomega Zip drive
Office suite	Lotus SmartSuite	Lotus SmartSuite 97	○	Office 97 SBE	Office 97 SBE
Other software		IBM ViaVoice and headset		McAfee Virus Scan	
Annual company turnover	n/a	£2 million	£8 million	n/a	£7 million
Number of employees	12	7	28	n/a	35





# Some like it hot

The Mobile PIII is the latest processor technology to be squeezed into notebook PCs. But coming so soon on the heels of the 266MHz Tillamook, is it hot stuff or merely a cool con? Adele Dyer and Paul Trueman review a threesome of mobiles with the new chip.

**T**he rate at which new processors are released onto the market has accelerated to a dizzying pace. Only a few months have elapsed since the release of the 266MHz mobile Pentium with MMX technology, also known as the Tillamook chip. Now we have the release of another desktop processor technology, this time shrunk to fit a notebook: the Mobile PIII.

Even before this processor was released there was scepticism in the industry as to whether or not the chip would be worth paying

for. There were fears about how much energy it would sap and, as a result, how much heat it would produce. And there were fears of overheated machines running off batteries that could not keep up with the demands placed on them by the processor.

So, is it as hot (in both senses of the word) as either side would have us believe, or is it just going to burn a hole in our pockets? We gathered together three notebooks to test out the claims and find the truth behind the hype.

### Dell Inspiron 3200

Dell has two lines of notebooks. The one that has been around for longer, and which most people know, is the Latitude range. These notebooks have a reputation for high-quality and usually do well in tests for reliability, even surviving the notorious "torture" test (devised by an American publication).

The Inspirons form the budget range and are aimed at the price-conscious. Unfortunately, if you are used to Dell's Latitude range, the cheap-and-cheerful nature of the Inspirons shows up badly.

Dell buys its Inspirons from a Taiwanese manufacturer, Compal, which is also used by many small notebook vendors. Bulk-produced Taiwanese notebooks have come in for some harsh criticism in the past for their shoddy quality, and while this particular model does not appear to have any serious faults, it is not up to the standard of the Latitudes.

It seems to have all the features you might expect from a budget notebook, including a 266MHz PII, 48Mb of RAM, a 4Gb hard disk and a 13.3in TFT screen. It also has a CD-ROM drive (which can be swapped with the floppy drive), one USB port and two PC Card slots. However, these seem like ticks in the box and represent few reasons to buy the Inspiron.

There is the much faster 1.4Mbit/sec IrDA 1.1 and there are line in, line out and microphone jacks, but the speakers are poor and there is no TV out for displaying your presentations on a TV set.

Our main criticism was the sheer noise made by this notebook. Turn it on, and its very noisy fan kicks straight in as the machine grinds away. Compal has perhaps not paid as much attention as it might have done to engineering the PII successfully: the fan comes on very quickly, and when you go to try out the trackpad, it keeps wandering away from you. No matter how much we fiddled with the settings, this problem only got worse, not better.

**Price** £2,583.83 (£2,199 ex VAT)

**Contact** Dell 0870 1524625 [www.dell.com](http://www.dell.com)

**System Reviewed** PII 266, 48Mb RAM, 4Gb HD, 13.3in XGA TFT screen.

**Good Points** Reasonable performance.

**Bad Points** Noisy. Jerky trackpad.

**Conclusion** Dull and disappointing.

★★★★☆



### Gateway 2000 Solo 9100

Gateway has made huge strides into the notebook arena during the past year, offering high-spec machines with extras that few other notebooks have, yet all at a reasonable cost.

The latest Solo 9100 follows the same pattern. It is, of course, one of the first to contain a 266MHz PII mobile chip and one of the first to offer an optional DVD drive.

Gateway was not the first manufacturer to put 3D graphics and a 14.1in screen in its top-of-the-range notebook — IBM had these several months ago in its ThinkPad 770. But very few others have

followed suit. Add to this a staggering 128Mb of RAM with one free RAM slot, a good 56K PC Card modem, plus a copy of LapLink and MS Office SBE, and you've got nearly everything your heart could desire.

But why do you need all these bells and whistles? The 9100 is a desktop replacement machine, so it is probably also going to replace the monitor on your desk. This display runs in XGA mode (1,024 x 768) in millions of colours, and although on the prototype model we saw there was a slight escape of light from the bottom edge, it was otherwise a good screen.

As for the Trident 3D graphics chip, it boosts your graphics performance all round, especially on graphics-intensive applications like video (it comes into its own when playing DVD movies).

It is also a good way of future-proofing yourself: in the future, even humble office applications will start to make use of 3D graphics.

The optional DVD drive has been put in one bay together with the floppy drive, so you do not need to swap drives. With the TV out port, you can even hook it up to a TV to watch your DVD movies. However, if you need more battery life, it can be swapped for a second battery.

Gateway seems to have done a good job of dealing with the heat problem created by the PII processor (the company freely admits that it was not an easy obstacle to overcome). Even after having been run hell-for-leather during our tests, the Solo 9100 did not get more than moderately warm.

**Price** £3,876.33 (£3,299 ex VAT)

**Contact** Gateway 2000; 0800 282000 [www.gateway2000.co.uk](http://www.gateway2000.co.uk)

**System Reviewed** PII 266, 128Mb RAM, 8Gb hard disk, 14.1in XGA TFT screen.

**Good Points** Big screen. 3D graphics. Bundled software. TV in and out. DVD. 4Mb video RAM.

**Bad Points** Hard to find any.

**Conclusion** An exceptionally well-specced notebook.

★★★★☆





### Hi-Grade Notino As6266-2

The first thing you notice about this notebook from Hi-Grade is its outward appearance. The As6266-2 is covered in a stylish layer of black rubber (not as exciting as it sounds) which gives it a more streamlined appearance than most other notebooks. There are some impressive specifications, too: a 13.3in TFT XGA screen, 4.1Gb UDMA hard drive, 48Mb of SDRAM, and a 2Mb NeoMagic MagicGraph graphics chip. And Hi-Grade plans to bring out upgrades, with DVD drives and 3D graphics chips, soon.

You need to switch off the notebook before swapping between the floppy and CD drives, as Windows 95 does not allow hot-swapping of drives. But it is possible to warm-swap the Li-Ion batteries, putting the PC in Suspend mode beforehand.

There are VGA and TV out ports should you wish to work from a CRT monitor or hook up to a television screen, as well as a docking-station connection, and the large screen afforded a sharp picture. The Notino has either two Type II or one Type III PC Card, and this model arrived with a "ClipperCom World" global modem card installed.

In a neat touch, the keyboard is raised up and tilted at a slight angle. Apart from the fact that this aids typing, it also increases the ventilation of the mobile's processor and RAM. Hi-Grade has been able to use the same notebook chassis as that which housed the Tillamook chip — the As6266. The PII mobile does run hotter in this machine, although it doesn't heat up enough to activate the internal regulator fan.

This is quite a heavy piece of kit, weighing in at 3.5kg with the battery. Although it would be an excellent desktop replacement with its 13.3in TFT XGA screen, if you are often "mobile" with the notebook, its weight might prove cumbersome.

**Price** £2,849.38 (£2,425 ex VAT)

**Contact** Hi-Grade 0181 5326100 [www.higrade.com](http://www.higrade.com)

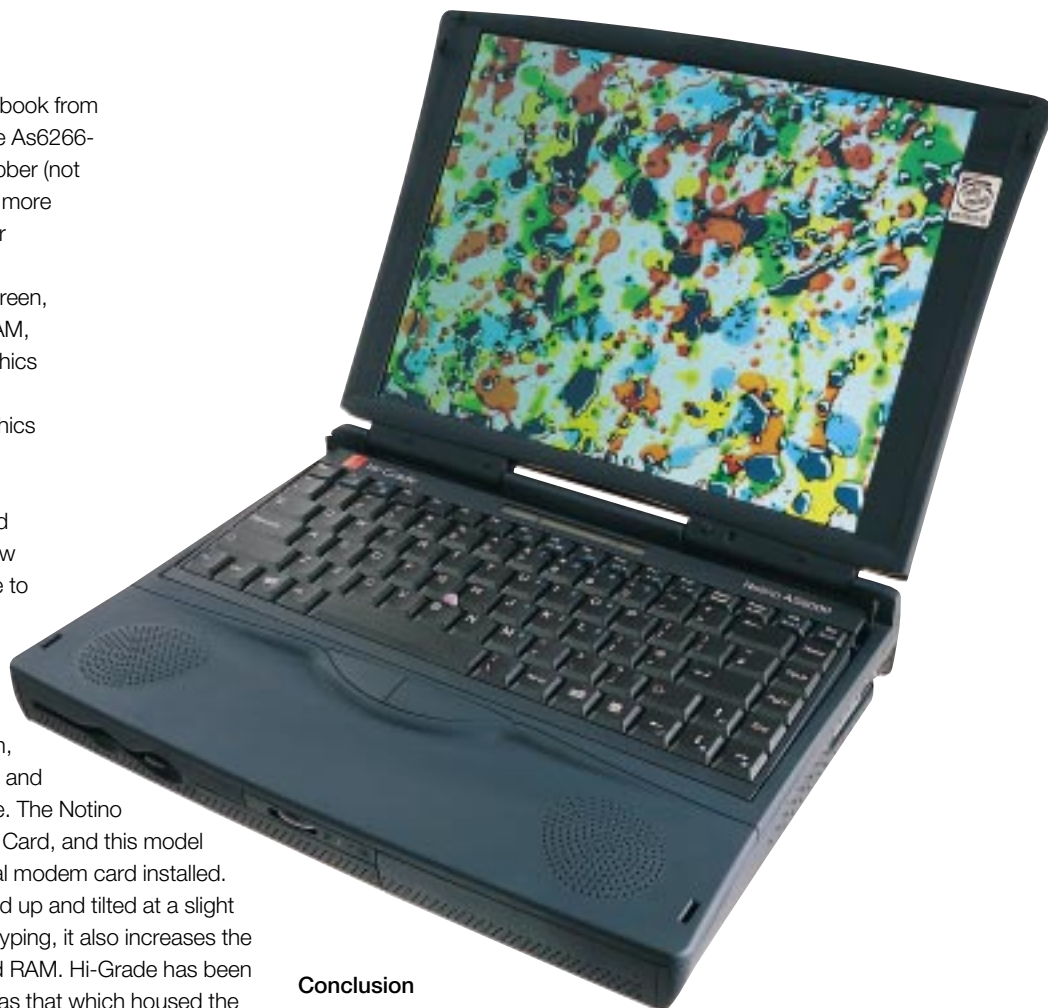
**System Reviewed** PII 266, 48Mb RAM, 4Gb hard disk, 13.3in XGA TFT screen.

**Good Points** Excellent large screen. Attractive design.

**Bad Points** Hot and heavy rubber.

**Conclusion** A good desktop replacement.

★★★★★



### Conclusion

Why upgrade a Tillamook to a PII? Intel is resting its hopes on the claimed performance boosts of the PII of ten to 30 percent over its counterpart, the Tillamook, as well as on the ability of manufacturers to engineer their way out of the heat and power-consumption problems.

Overall, we found that in the notebooks we saw, the speed increases were in line with Intel's projected figures, and that the manufacturers had mostly handled the heat problems in innovative and effective ways.

The Hi-Grade Notino As6266-2 is an impressive desktop replacement notebook: we were pleased with its performance and its handling of the inherent problems in the Mobile PII. But the Gateway Solo 9100 gets our vote here, simply for the staggering number of features it has managed to cram into the chassis, including DVD, 3D graphics, USB, TV in and out and a 14.1in screen.

### Table of Features

Manufacturer	Dell	Hi-Grade	Gateway 2000
<b>Model</b>	<b>Inspiron 3200</b>	<b>Notino As6266-2</b>	<b>Solo 9100</b>
Price ex VAT	£2,199	£2,425	£3,299
URL	<a href="http://www.dell.com">www.dell.com</a>	<a href="http://www.higrade.com">www.higrade.com</a>	<a href="http://www.gateway2000.co.uk">www.gateway2000.co.uk</a>
Tel No	0870 1524625	0181 532 6100	0800 282000
RAM	64Mb	48Mb	64Mb
Hard disk	4Gb UDMA	4Gb UDMA	8.1Gb UDMA
Screen	13.3in TFT	13.3in TFT	14.1in TFT
IrDA	v.1.1	v.1.1	v.2.1
CD-ROM drive	24x Variable CD	20x Toshiba XM1602B	Toshiba 820x CD-ROM/floppy



## What is the PII mobile chip?

**W**hen it was released last year, the Tillamook mobile module was seen as a breakthrough for two reasons. Firstly, it used the new 0.25-micron process, and secondly, it was mounted on a mobile module which meant that notebooks were finally upgradable (at least in theory). However, it was also seen as only a temporary stopgap, as the forthcoming PII mobile processor would finally give notebooks the same power as desktops.

### Similarities and differences

There are obvious similarities between the PII and the Tillamook processors: both use the 0.25-micron process and both are mounted on a mobile module, although the PII mobile is also enclosed in a new cartridge format designed for ultra-thin notebooks. These cartridges cannot be put in the same slot as the mobile module and so require a different motherboard.

The differences can be found in the P6 architecture. The 512Kb L2 cache has been integrated into the processor, and the temperature control has been transferred on-chip to measure temperature more accurately (of which more later).

Intel has improved the processor's access to the L2 cache by doubling the bus speed between them from 66 to 133MHz. The PII also has a Dual Independent Bus architecture, enabling the CPU to use both L2 cache bus and the system bus simultaneously. Intel has also altered the way it links its silicon die to the connector pins through the substrate material. Previous processors used gold wires, but the PII links the two through soldered ball bearings sunk into the substrate, which it says are cheaper as well as being better conductors.

As with the desktop PII, the mobile has the Dual Independent Bus with Dynamic Execution. Intel claims to have refined the clock gating system, too, allowing the processor to be far more selective about which parts of itself it gates to save power. The Northbridge chipset is now the 440 Mobile BX, based on the 440BX used in the new desktop PII's, rather than the 430TX used with the Tillamook. This offers the same Quad Port Management and AGP

### Mobile Pentium II on a mobile module, and in the cartridge format

features as the desktop PII, so expect to see much-improved notebook graphics in the not-too-distant future.

### Hungry for power

The PII does consume more power than the Tillamook: Intel's own figures show that the TDP (Thermal Design Power — a measurement of power consumption when the computer is running processing-intensive tasks) of both the L2 cache and a PII 266 is around 8.6W; 2W higher than Tillamook running at 266MHz. A notebook's key components consume around 23-24W and the screen around 3-4W, so those two Watts represent an increase of approximately seven percent in overall power consumption. This makes life more difficult for notebook manufacturers, who have to squeeze more life out of battery technologies which have not evolved in line with the greater demands placed upon them.

### More transistors, more heat

Frank Spindler, marketing director of Intel's Mobile Products Group, justified this higher power consumption, saying: "It's around 2W above the fastest Tillamook. The PII is the next generation of processor and so there are a lot more transistors built in to the device to deliver that technology." However, Intel is keen to underplay the inevitable heat increase

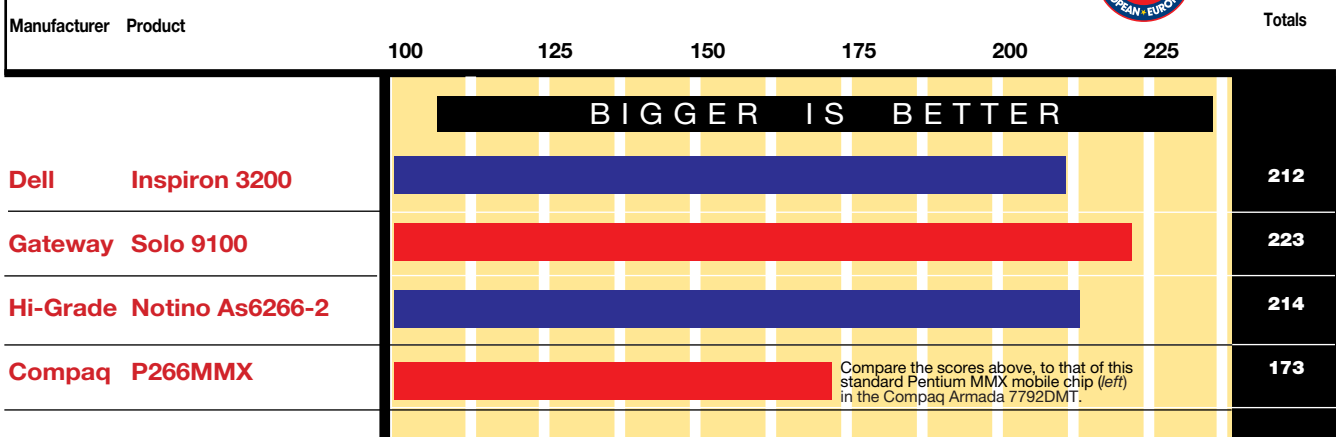


associated with more transistors. The die in the PII has been designed to run up to 100°F rather than the 80°F limit of the Tillamook.

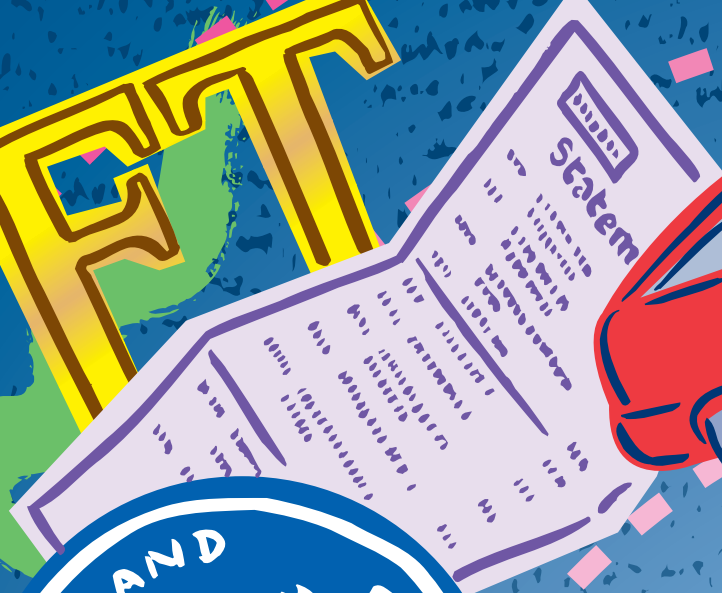
Spindler also pointed out the advantages of a higher case temperature: "It means that the processor won't throttle back at all, the mainstream cooling is going to let you run the processor at full speed all the time." On the mini-cartridge, the die has been left exposed so that heat dissipation devices can be attached directly, thus increasing their efficiency.

This summer will see the launch of a PII mobile clocked at 300MHz. Spindler hinted that the next performance leap after 300MHz would need to refine the die process even further. "You can expect that we'll apply 0.18 technology in mobiles," he said and added that Intel also has 0.12-micron technology in development.

## BAPCo Sysmark tests



# FT



# Money spinners

If juggling figures and playing with numbers are not a strong point, your PC can lend a hand. David Carter looks at software designed to help you keep your head above water.

**T**here are not many applications that businesses can do without, and accounting software is one of them. No matter what kind of business you run, you will have to keep track of your sales and purchase invoices, cheque payments and receipts, as well as produce figures for the tax man at the end of the year. The trick when buying an accounts package is to buy one which satisfies your accountant on the bookkeeping side while providing you with the detailed information you need to run your business.

Throughout this group test we've assumed that you're an owner-manager, without a bookkeeper, who is going to buy from a retail outlet rather than a specialist dealer. We've addressed small-to-medium-sized businesses (i.e. those with not more than around 100 employees). We've explained how an accounting package is made up of modules and the particular job carried out by each (p196). And we've tested each package for those features we believe to be the most important: for a list of these criteria, see overleaf.

Whether you're a sole trader, or even if you do not run a business but just want to keep track of where your money goes, we have addressed your needs in a section on personal finance packages (p209). If you want to try banking over the internet or keeping up to date with stocks and shares, we deal with that too (p208).

You can keep your money in check, with our antidote to your accountancy angst.

## Accounting software Contents

- 196 What is an accounting package?
- 196 How we did the tests
- 198 Bestware MYOB
- 200 Intuit QuickBooks 5
- 203 Megatech TAS Books for Windows 95/NT v3.08
- 204 Pegasus Capital Lite
- 205 Sage Instant Accounting 98
- 207 Access Intro
- 207 DO\$H Cashbook
- 208 **Editor's Choice**
- 208 Online banking and investment
- 209 Personal finance packages
- 210 Table of features

## Ratings

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



## What is an accounting package?

**A**fter word processing, the next key application for business PCs is accounting. But what exactly does an accountancy software package do? — There is no simple answer because any accountancy package is a combination of several “modules”, each of which carries out a particular job.

### ■ Ledger modules for statutory reporting

At a basic level, there are the three “ledger” modules: sales ledger, purchase ledger and nominal ledger.

These core modules are to be found in every accountancy software package. They record all the financial transactions of a business — sales invoices, purchase invoices, cheque payments and receipts — and extract from them the reports required by law: principally, a profit and loss report and a balance sheet.

Every accounts package will provide you with a profit and loss report and balance sheet for the Inland Revenue, together with a VAT analysis for Customs and Excise. The *nominal ledger* is used to unify all the figures and to create profit, loss and balance sheets.

An invaluable by-product of these core modules is cash control. Because it keeps track of unpaid bills both to customers and from suppliers, it enables you to schedule the flow of money in and out of your bank account.

On the sales side, the *sales ledger* records invoices against each customer’s account and payments made by them in settlement. It will automatically print monthly statements and provide you with an aged debtors report to show how much you are owed by each customer and when payment is due to be made.

The *purchase ledger* works in the same way, but on the purchases side, and provides an aged creditors report which illustrates how much you owe to suppliers and when payment is due.



### ■ Management accounting

Although the statutory accounts show you the broad brush picture of how well you are doing, they are not sufficiently detailed to enable you to control business profitability.

For that, you need to pinpoint sales and costs in more detail. Which products do we sell most? Which jobs are the most profitable? Which customers generate the biggest margin? And so on.

Unlike statutory accounts, which are the same for everyone, different types of businesses require different sorts of management information.

Some packages can provide this information, others can’t. For example, if you are a Distribution or a Jobbing company (see *below*) you may want to keep track of the prices you are paying for products or raw materials. So, when you receive a purchase invoice from a supplier for 100 widgets costing £5 each, you want to record this against the widgets stock record on your accounts package.

The American packages in this review (Quickbooks and MYOB) both allow you to do this, but the UK packages (TAS Books, Pegasus, Sage and Access) do not. The British argue that you should use a purchase

order processing (POP) module for this, but for most small companies it is simply too long-winded. So, for someone who wants to keep track of what he is paying for products and materials, there is only QuickBooks and MYOB from which to choose.

### ■ Distribution company, service company, jobbing company

In this review, we’ve tried to distinguish the principal types of business and to identify which packages will suit each.

**1.** Firstly, there is the *distribution* type of company, which hold stocks of the products it buys and resells. Typically, this distribution company will have a standard price list of products and will also require a regular stocktake to

produce the accounts. For these, a stock control module is essential. Sales invoicing will also be needed, with sales analysis.

**2.** Then there is the *service* company, which supplies services to its customers and bills them out at a standard rate. It is people-orientated and does not hold stocks of any product.

For an accounts package the service company is the easiest to satisfy. Apart from the standard ledgers, all that is likely to be needed is sales invoicing.

**3.** Finally, there is the *jobbing* company which does a complex job on behalf its customer. Here, the emphasis is on the purchases side rather than sales.

It is important to keep track of costs in order to recharge them to the client, or to ensure that a profitable price has been quoted. This is achieved by allocating costs to a cost centre or job number so that it is possible to calculate a mini profit and loss account for each job.

The jobbing company which keeps track of material costs will find a “parts explosion” (or bill of materials) module invaluable. This lists the components of an assembly and recalculates the assembly cost automatically as component costs change.

## How we did the tests

**W**hile carrying out the tests, we assessed each package on seven main criteria, as follows:

### 1. Suitability for each type of company

Does the package have the features required to provide the management information required by (i) a distribution company (ii) a service company, or (iii) a jobbing company?

### 2. Are self-teach materials provided?

Does the package come with sufficient training materials for the new user to learn it or will he need an outside consultant? In particular, does it come with a tutorial?

### 3. Guidance on setting up your new system

One of the hardest tasks with an accounts package is transferring your manual records and unpaid invoices (opening balances) onto the new computer system. And this has to be

done before you even know how it works. What assistance does the new system provide you with in this instance? Does it clearly explain the terminology?

### 4. Ease of use when entering transactions

Most of the time you will be entering transactions; invoices, payments etc. Does the package make this as easy as possible by offering pop-up lists of customer codes, or by giving prompts explaining what to do next?

### 5. Easy access to data?

Once you’ve entered transactions, is it easy at a later date to retrieve them to the screen and, if necessary, “drill down” to see them in detail?

### 6. Easy to correct errors?

If you find that a transaction has been entered incorrectly, how easy is it to correct? Can you pull it back to the screen and change it? And does the package then

automatically recalculate all the figures?

### 7. Good cross-referencing to source documents (auditability)

All your entries into the accounts package will be from an original source document (purchase invoice, cheque-stub, paying-in slip etc). Once any transaction has been entered, the computer should display a unique reference number for this transaction which you then write onto the source document as a cross-reference. Does your package do this?

In addition, if you enter an invoice that is several months old, does the package correctly post it to the current month or does it post it back and lose the VAT? Finally, can the package provide you with a list (a Daybook) of all the transactions you’ve entered during the day’s session?

**Personal  
Computer  
World**  
**Editor's  
Choice**

**Bestware MYOB (Mind Your Own Business)**

**M**YOB was first released in 1989, originally designed for the Apple Mac. It's an American product but is customised and marketed over here by Bestware (UK). MYOB has never had the marketing muscle behind it to gain a big market share but over the years it has obstinately remained a contender because of its sheer quality. It is one of the best accountancy packages around.

MYOB comprises the three ledgers, together with invoicing and stock control. On the purchases side, MYOB is equally versatile at handling purchase invoices as it is at dealing with sales invoices, enabling you to analyse purchase invoices to nominal account, to product or to job. There's an "auto-build" feature, too, which enables you to hold the components of an assembled item. MYOB's feature list makes it equally suitable for distribution, service or jobbing companies. It does not handle VAT Cash Accounting.

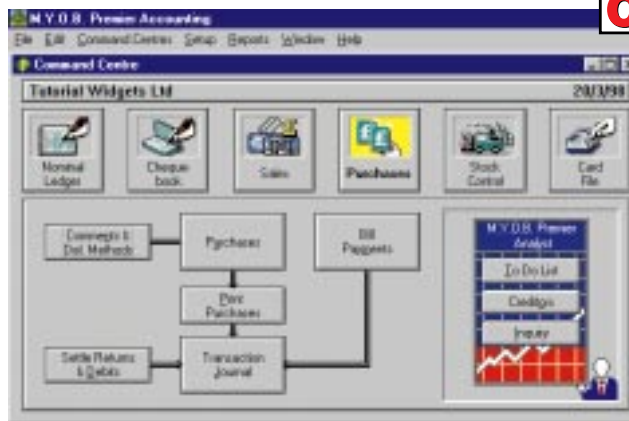
**Learning and getting started**

MYOB has a separate Getting Started manual, which I found logical and well signposted. After installation it recommends that you go into the sample files of a company called Widgets Ltd, but this is of the "feel free to browse and look around" variety, so skip it and go straight into the step-by-step tutorial for the Tutorial Widgets company. In this, you use MYOB to set up and make the first month's postings for a new company.

You are taken through 12 sample transactions which illustrate the major types of transaction you will be using in your own company. Although this was just sufficient, I'd like there to have been more.

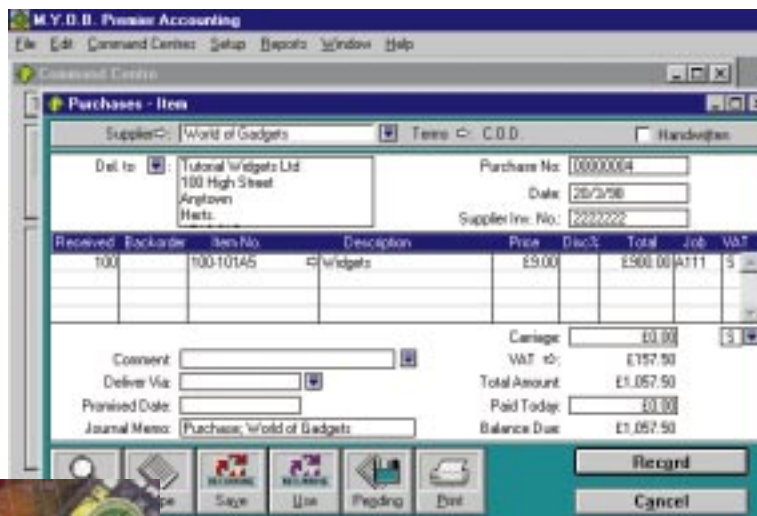
Data entry into MYOB was pure pleasure. The Enter and Escape keys work the way you'd expect and navigation is fast and confident. Colours are attractive and guide the eye naturally around the screen. Record and Cancel buttons give you a feeling of control and feedback on what you've just done. MYOB's is easily the best-designed and most fluent GUI interface of any of the packages reviewed here.

The tutorial takes you through samples of the most common transactions and after each one it shows you the resultant debits and credits, but the accounting stuff does not become oppressive. The only oddity was that



**Left MYOB's command centre takes you logically through the menus**

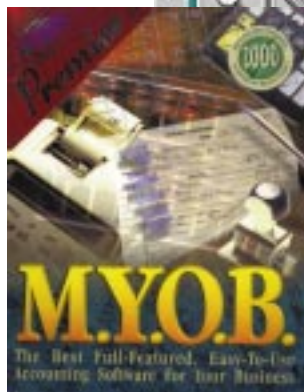
**Below MYOB's ability to analyse purchase invoices is outstanding**



abbreviated into a couple of sentences. Generally, though, I found the MYOB manuals consistently helpful and relevant.

**Data access and error correction**

When it comes to accessing data and drilling down to detail, MYOB is excellent: you simply click on a little arrow next to the record and the details appear. If you want to be able to amend faulty transactions, you can go into Preferences/Security and set a switch which allows you to amend past records.



it seemed to assume that major overhead items like advertising, office cleaning, telephones and electricity should all be entered and analysed to VAT as they are paid. In fact, they should all be first recorded as purchase invoices and then the VAT analysed.

Analysing sales or purchase invoices on individual products and jobs in MYOB was quite superb; infinitely superior to any of the UK packages and only equalled by QuickBooks. There is a basic, but perfectly adequate, form of Order Processing in MYOB as well. If you

want to create a sales or purchase order, all you have to do is create a sales or purchase invoice, print it off, then save it as Pending. When the goods arrive, simply recall the order and save it as an invoice — it's so simple.

MYOB, like QuickBooks, takes you through a Setup Interview: an interactive guide which asks you numerous questions and configures the new system according to your answers. This was very thorough but when it came to the key task of entering unpaid sales and purchase invoices, I started to get confused: the manual starts covering the setup of "linked accounts" and the posting of opening balances for sales, purchase and nominal ledgers simultaneously. There might be two or three days work here and it's all

On the other hand, if your accountant insists on a reversing entry only, all you have to do is to recall the faulty invoice to the screen and select Reverse from the Edit menu. On the auditing side, MYOB is fairly good since the input screens all display a sequential transaction number for you to write onto the source document. One black mark, however, is that MYOB only records one date for each transaction, so if you enter a back-dated invoice it will post it back to that period, probably losing the VAT. The only way to avoid this is either to date the invoice this month or manually "close" the period each month in System Preferences.

**PCW Details**

**Price** £229.13 (£195 ex VAT). Direct from Bestware £6 carriage.

**Contact** Bestware UK 01752 201901  
[www.myob.co.uk](http://www.myob.co.uk)

**System Requirements** Win3.1, Win95.

**Good Points** Superb GUI interface. Good self-teach. Versatile.

**Bad Points** A bit wobbly on VAT.

**Conclusion** Ideal for the owner-manager. Good for bookkeepers, too.

★★★★★

## Intuit QuickBooks 5

**Q**uickBooks has won itself a lot of praise in reviews for its ease of use and approachability. For £149 you get sales, purchase and nominal ledgers, together with invoicing and stock control. QuickBooks is one of only two packages in this review which allows you to record the products you are buying when you enter a purchase invoice. It can also analyse a job, so QuickBooks is one of the most versatile products reviewed, being equally suitable for a distribution, a service or a jobbing company. One small negative is that it has no Parts Explosion, which can be so useful for a jobbing company.

### Learning and getting started

The self-teaching materials supplied with QuickBooks were disappointing. There is some sample data for a company called Turner Hardware, but no guidance is given on how to enter transactions.

Anyway, things improve soon after as QuickBooks takes you through an Easy Step Interview to set up your new company. The Easy Step Interview took me about two hours and asks a series of questions (e.g. "Does your company maintain stock?") that will define how the new system will be configured and how you should load up your existing manual data. This is first-class, so one can only lament that, in key areas, the advice QuickBooks gives is wrong. For example, it tells you to enter the balance on your bank account from the bank statement but doesn't tell you to then enter uncleared cheques. Worse, it tells you to enter the unpaid invoices on customer and supplier accounts as a single opening balance rather than to record them all individually. This is bad advice. Entering them individually may take a bit longer but it will make it much easier to allocate cash receipts later on and you can start to print statements from Day 1.

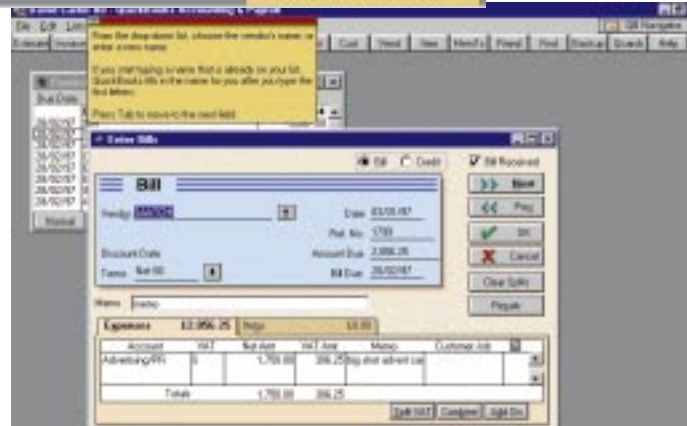
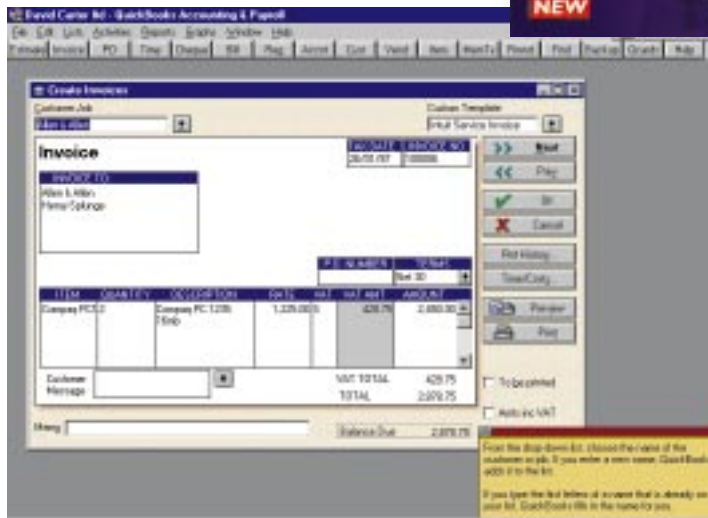
### Data entry

QuickBooks' screens are attractively set out with lots of helpful features. As you move through each field, a bubble appears with helpful advice. In addition, if you enter the first few letters of an account code, QuickBooks finds you the rest of the code automatically.

Initially, I generated a lot of error messages because I am used to pressing the Enter key rather than Tab, but later I went into the Preferences screen and found a switch that allows you to move from field to field via Enter. It is odd that these Preferences were not covered in the Easy Setup Interview. Also I

**Below** Well-designed invoice entry screen for QuickBooks, with good online help

**Bottom** QuickBooks' Cash Payment screen is well designed and easy to use



would have preferred more feedback than just a beep when I had completed a transaction. But you get used to this quickly and, on the whole, data entry in QuickBooks is easy.

### Data access and error correction

There is a wide variety of reports, with superb filtering and drill-down to source transactions which make up the balances. If you see that the transaction is in error, it is very easy to go in and correct it — perhaps too easy. I looked at the sales figure on the Trial Balance report, drilled down to one of the invoices, then changed the customer name and removed the VAT. No problem, but now a sales invoice has been sent out to one customer and the same invoice is recorded on QuickBooks as having been sent to another customer. And the VAT totals now no longer tally with the amount I put on my VAT Return.



### Auditability

Things started to go haywire when I tried to review the set of sample purchase invoices I had entered.

There is only one invoice date field and, when displaying a list of invoices you've just

typed in, QuickBooks doesn't display them in the order you entered them, but re-sorts them all into date order. This makes it extremely difficult to reconcile your manual records with what's in QuickBooks. It doesn't display a unique sequential number, neither does it realise that VAT must be accounted for in the month the invoice is posted (not in the month the invoice is dated). If you post an invoice that is several months old (or get the date wrong) QuickBooks just applies the VAT to the month of the invoice — when, of course, the VAT return has already been completed.

My guess is that anyone who uses QuickBooks may find themselves

regularly losing several hundred pounds a year in unclaimed VAT, although their accountant should pick it up at year-end.

However, the point is that QuickBooks is so lacking in controls that it needs an experienced bookkeeper to run it, who is aware of the

pitfalls. This is a pity, because otherwise QuickBooks is a cracking package. Really, Intuit has got to tighten it up with some proper auditing controls.

## PCW Details

**Price** £233.83 (£199 ex VAT)

**Contact** Intuit 0181 990 5500 [www.intuit.co.uk](http://www.intuit.co.uk)

**System Requirements** Win3.1, Win95.

**Good Points** Easy to use. Versatile. Superb reporting.

**Bad Points** No self-teach facilities. Auditing controls non-existent.

**Conclusion** Top-class design but requires an experienced bookkeeper.

★★★★★



## Megatech TAS Books for Windows 95/NT v 3.08

**M**egatech's TAS Books for Windows was released in 1997 and is the successor to its existing accounts package, TAS Books for DOS. This latter has some 40,000 users and its Accounts Processor design was the first to allow users to amend transactions if they'd made any errors. At the time (1991) this raised eyebrows in the accountancy profession because until then you could amend an error by entering a reversing journal or some other convoluted transaction. Now, the facility to retrieve and correct faulty transactions is commonplace, making accounts packages far easier to use.

TAS Books for Windows (TBW) is closely based on TAS Books for DOS so that existing users can make the transition easily from DOS to Windows. At the "special price" of £99 it comprises the three ledgers, a cashbook program for entering non-ledger payments, together with sales invoicing. There is a Stock file for invoicing purposes which does not hold balances, together with a Parts Explosion facility.

TBW does not have the facility to record details of products when you enter a purchase invoice. It is therefore not suitable for businesses that wish to track the costs of the products they buy. However, its Department codes will allow you to analyse to a job. So, TBW will suit service companies, as well as distribution and jobbing companies which have no need to track product costs.

### Learning and getting started

One of the selling points of TAS Books for DOS was its remarkable self-teach tutorial. This took you through worked examples of pretty much every type of transaction you could think of and was, in effect, a complete self-teach manual for anyone who wanted to learn computerised accounting.

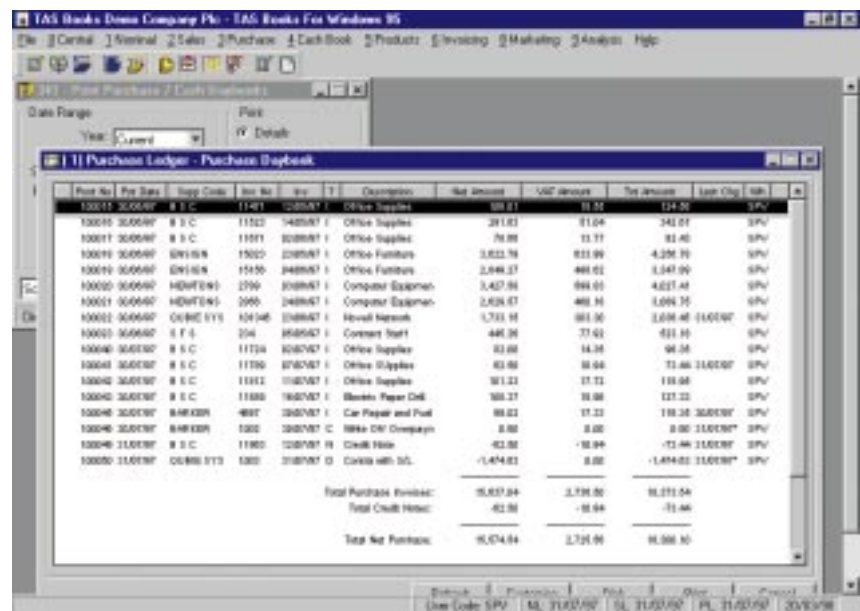
Unfortunately, the Quick Start and Tutorial Manual accompanying TBW is not so good. The initial Overview and Features section is just marketing puff — ignore it and go straight to the tutorial. This goes on for nearly 80 pages and takes you through most of the types of transaction you will need to enter. TBW's tutorial remains the best available.

### Data entry

TBW is Megatech's first Windows product. The screens are austere, with a colour scheme of white and battleship grey as in Excel or Word. There is not the immediate attractiveness of Sage, QuickBooks or MYOB.

A bit of colour would help. For example, TBW automatically provides on-screen Help whenever you enter a field. The other vendors display their Help messages in balloons on a yellow background so you can't miss them, but Megatech's are on a grey background and you could run TBW for weeks without realising that they are there. I had trouble with the Enter key, which in TBW acts to save the screen rather than to move from one field to the next. However, working your way through the tutorial helps you get used to these limitations, and appreciate the power and quality of TBW.

Entering a purchase invoice shows just how solid TBW is on the auditing side. TBW was the only package in this review which



asked for two dates: one being the date of posting, the other being the date of the invoice. This is the right way to do it because the VAT and invoice posting now go into the current (posting) month, while the invoice date gives proper ageing on the Aged Creditors Report. With TBW, the problems of posting prior period transactions simply disappear. Another very attractive feature is that you can print out an on-screen Daybook list of the transactions you have entered for any period.

You can select any transaction from the list and drill down to see the originating document, then the nominal and VAT analyses, then see how it was paid. I have installed TAS Books with several users over the years and all have found it eminently satisfying from the bookkeeping point of view.

TBW sales invoicing is a little convoluted (why does Megatech call a sales invoice a "sales order"?) but immensely powerful because of the Data Analysis and "Marketing" modules which automatically analyse your sales data. The Marketing module will be of particular interest to companies who sell by mail order, since it enables you to make sophisticated response analyses of where

your business comes from: advertisements, referrals, seminars and so on. Equally interesting is the Analysis/Data warehousing module, which is aimed specifically at managers. Here, TBW summarises all your sales by product, by customer, by salesman, into month-on-month totals and allows you to drill down from the totals into the original invoice if you want to query the monthly totals. Powerful stuff!

Personal  
Computer  
World  
**Highly  
Commended**

Left TAS Books' powerful Analysis feature lets you drill down from monthly totals to source invoice

Below On-screen Purchase Daybook. Note the two dates, which help make TAS Books the best package from an audit point of view

### PCW Details

**Price** £116.33 (£99 ex VAT)

**Contact** Megatech Software 01372 727274  
[www.megatech.co.uk](http://www.megatech.co.uk)

**System Requirements** Windows 95 or NT.

**Good Points** Good self-teach tutorial. Good bookkeeping. Powerful sales analysis.

**Bad Points** Austere interface. Cannot analyse product purchases.

**Conclusion** Good bookkeeping and very powerful analysis.

★★★★★

## Pegasus Capital Lite

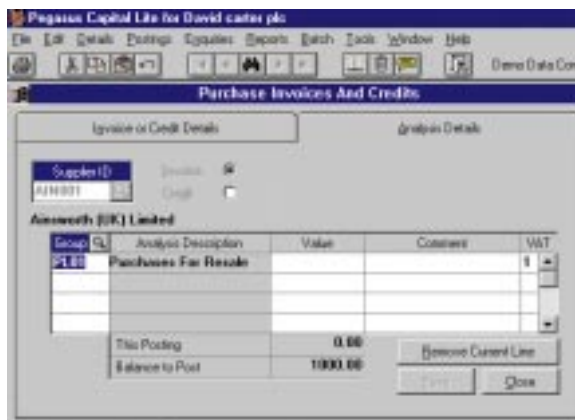
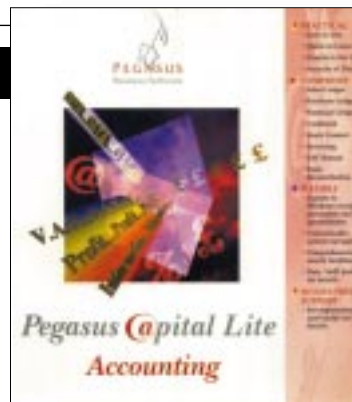
**C**apital Lite contains the standard sales, purchase and nominal ledgers. It also has sales invoicing and stock control. However, purchase invoicing does not record details of products purchased, neither does it allow costs to be analysed to a job. This

finished entering opening balances you have to switch Capital into normal mode which does update nominal ledger — non-accounting people will find this hard.

### Data entry and posting

Starting up Capital is rather forbidding. The screen is all grey and blank except for a row of menu options at the top (nothing like Sage with its cheerful colours and nice on-screen list of customers all ready for you to do business with).

Posting a purchase invoice is an odd process as you don't analyse the net amount to a nominal code but to a "purchases analysis" code. Presumably, the purpose of this is to allow you to analyse direct purchases in detail without



**Above** In Capital, you don't analyse to the nominal account but to an "Analysis Group"

**Right** Account enquiry in Capital. The ability to exclude paid transactions is great; but why show only five transactions at a time?

means that Capital Lite will suit a service company and any distribution company which does not wish to track the prices of the products it buys. However, it is unsuitable for a jobbing company or distribution company that needs to track product costs.

### Setting up and getting started

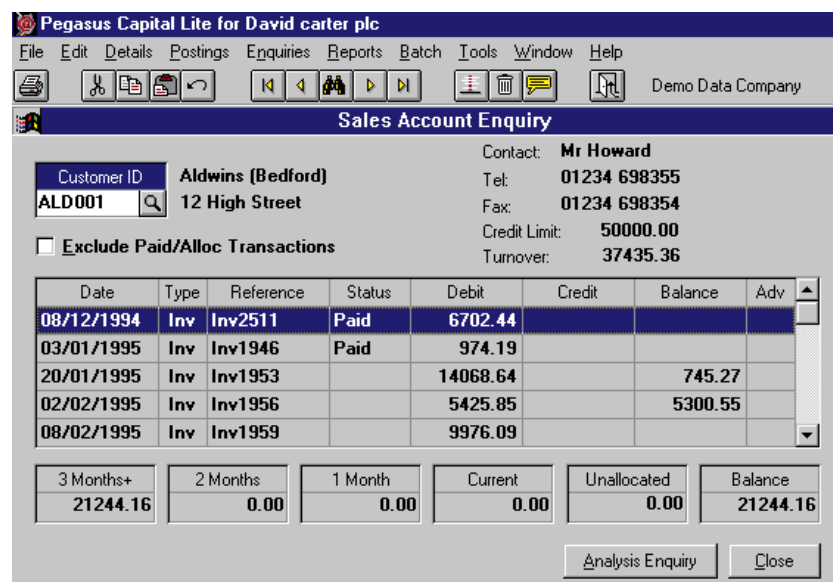
Installing Capital was a bit convoluted (the manual assumed I was using Windows 3.1) and I finally worked out how to install the (separate) tutorial. This, however, was a disappointment. The mouse pointer floats around the screen pointing at menus and I soon started to yawn. There's a company on the system called the Demo Data Company but you are simply invited to browse around and look at the data. In effect, then, there are no self-teach materials with Capital.

### Setting up the new accounting system

"The most difficult and confusing part of using an accounts package is often the initial setting up," states the manual. Quite right, so Pegasus supplies a new company setup wizard which takes 10-15 minutes to guide you through setting up the System parameters.

Capital asks whether you are a sole trader, a partnership or a limited company, in order to give you a suitable chart of accounts. It then presents a series of 37 cue cards as you work your way through each step. These cue cards offer step-by-step guidance through setting up new customers, new suppliers, new nominal accounts and new stock items. It's a bit of a slog but it's all there.

One thing did throw me. When entering initial opening balances you have to be in "Opening Balance" mode which does not update the nominal ledger. When you've



having to set up lots of nominal codes, but why not do the job properly and analyse directly to the individual product record?

Data access and enquiry was only fair. When looking at an invoice while in a customer account enquiry, you can drill down to see the nominal analysis detail and payment allocation but not the detail of the invoice itself.

I liked the Exclude Paid Transactions facility when showing a customer ledger, but why limit the screen to showing only five lines at a time? Most of the packages in this survey try to use on-screen lists whenever possible but Capital is the traditional design of accounting system where the data is buried deep down in the files and you have to hunt it out. And, once you have retrieved a transaction, there seems to be no easy way to correct errors in Capital.

On the auditing side, Capital was solid. When I entered a prior period invoice, it told

me that this invoice would be included in the current period and, sure enough, there it was on the daybook. Well done. But then Capital goes and ruins it on the auditing side because it generates no automatic cross-reference numbers except for sales invoices and credit notes.

To summarise, Capital is a traditional design of accounts package: solid on the

audit side but lacking most of the ease-of-use facilities of products like QuickBooks. There are no self-teach facilities with it and I think it will require expert help to get going. Only recommended to those with experience in bookkeeping who know what to expect.

## PCW Details

**Price** £99 (£84.26 ex VAT)

**Contact** Pegasus 01536 495000  
[www.pegasus.co.uk](http://www.pegasus.co.uk)

**System Requirements** Win3.1, Win95.

**Good Points** Solid, traditionally-designed accounts package.

**Bad Points** Too traditional for today's finances.

**Conclusion** Not for the owner-manager, perhaps more for the experienced bookkeeper.

★★★★☆

## Sage Instant Accounting 98

**S**age is the world's, largest supplier of accounting software. Its flagship product has always been the Sterling range, now renamed "Line 50" and distributed through the dealer market. Instant Accounting 98 is a cut-down version of Sterling/Line 50 and is sold via retailers and distributors such as PC World, Byte and Comet.

### Learning and getting started

Installation was straightforward. Sage takes you into an Easy Startup Wizard which asks you a series of questions to set up your chart of accounts, then to set up the defaults for customers, suppliers and products. It was clear, although a novice user might appreciate some guidance on the pros and cons.

After the five-minute wizard, Sage tells you that setup is complete. At this point you are left pretty much to your own devices. There's some sample data from a company called Demonstration Exhibitions but you're not given any help to find your way around it. There's also a Quick Tour but this is of the yawn-inducing slide-show variety. There are no practical exercises of the type you get with TAS Books or MYOB.

I tried the manual but all this does is go through all the menu options of Instant with a brief paragraph on each, none of which makes much sense at this stage.

Skipping through the Getting Started Checklist tells you to set up customer and supplier opening balances. Go into the Customer menu and you will find a special icon called New, which asks if you want to enter the balance as one block entry or as multiple transactions. I tried pressing the F1 Help key but Help had disappeared. Later, I realised that in fact Instant offers quite good help but in the Setup Wizards it is switched off, just when you need it most!

Essentially, Sage assumes you know what you're looking for. In fact, Instant's manual is virtually identical to that of Sterling. But retail purchasers need much more support than dealers and the novice will need outside help to get Instant up and running.

### Data entry

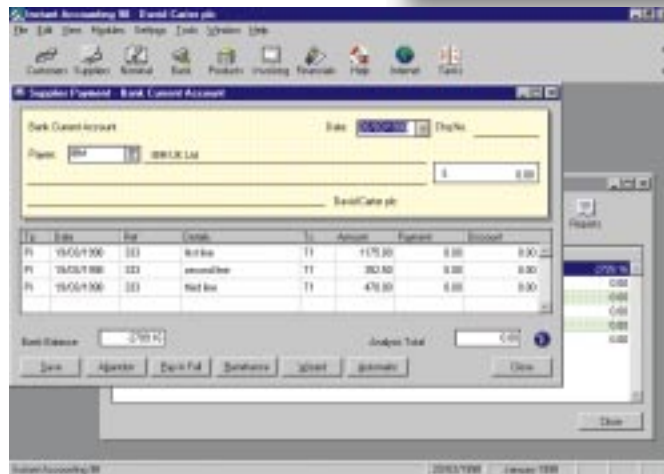
However, once you get beyond the setup stage and start entering customers and suppliers, things improve. Data entry was good. Most of the time Sage has disabled the Enter key, so if you Enter by mistake you do not find yourself thrown out of the program.

The one exception is invoice entry, where the Enter key works as you would expect. This brings us to the most controversial

aspect of Sage: its extraordinary Batch Invoice entry screens. Unlike all other accounting software vendors, who use both Transaction Header and Transaction Detail records, Sage only uses the former.

Suppose you have a purchase invoice and you wish to analyse it to ten departments or ten nominal codes. A standard accounting package will handle this by creating one transaction header record for the invoice, and ten transaction detail records for the ten analysis lines.

In Sage, however, you have to create ten separate invoices. And when you



**Left** Enter one invoice three lines long and you have to pay off three invoices in the ledger

**Below** You can sort Instant's on-screen lists any way you want — brilliant. But why can't you show the biggest balance first?



### Auditability

As you key in new customers, Instant displays them in a list box. It does the same with suppliers, products and nominal codes, as well as the Audit Trail. You can sort these on-screen lists into any order by clicking on the column headings — I loved it.

For many managers, these on-screen lists will make a good substitute for the printed reports and Sage should develop them further. For example: why can you only sort from lowest to highest, not vice versa? Why can't you change the order of the columns and print the results as a report? Why can't you choose any field from the master record to display on the screen? Why can't you apply Criteria to the Financials List to produce Daybooks? There's a lot of mileage here.

come to pay off the (one) invoice, you do not pay off one but ten.

The same thing happens with sales invoicing. If you generate an invoice for ten different products, Sage creates ten invoice records against which you will have to allocate the customer's payment. This means that Instant can only really be recommended to people whose invoices are never more than one line long.

In practice, this may not be a problem for users doing elementary bookkeeping because they may be content simply to analyse sales to sales and purchases to purchases. But Instant (and Sterling/Line 50, too) is unsuitable for anyone who wants more sophisticated analysis of what they are buying and selling.

## PCW Details

**Price** £99 (£84.26 ex VAT)

**Contact** Sage 0191 255 3000 [www.sage.com](http://www.sage.com)

**System Requirements** Win3.1, Win95

**Good Points** Attractive on-screen lists. Accounting standard.

**Bad Points** No self-teach. Difficulties with invoices over one line long.

**Conclusion** Limited to elementary bookkeeping tasks.

★★★★★



## Access Intro

**A**ccess Accounting was founded in 1991. Its flagship product, Access Accounting v.3, has some 7,000 users worldwide and won joint first prize for the BASDA (Business & Accounting Software Developers Association) mid-range accounting awards in November 1997.

The entry-level version, reviewed here, is available as Access Intro. The basic system comprises the three core ledgers. Thereafter

you can add stock control, invoicing/sales, order processing, and costing as additional modules, and add a second user. Access is sold via dealers only, so you won't find it in retailers such as PC World and its ilk.

Access is not designed for the owner-manager installing on his own, out of the box, so it is excusable that the manual and the startup notes did not tie up too well and that I had to call Access' technical support to help me get going.

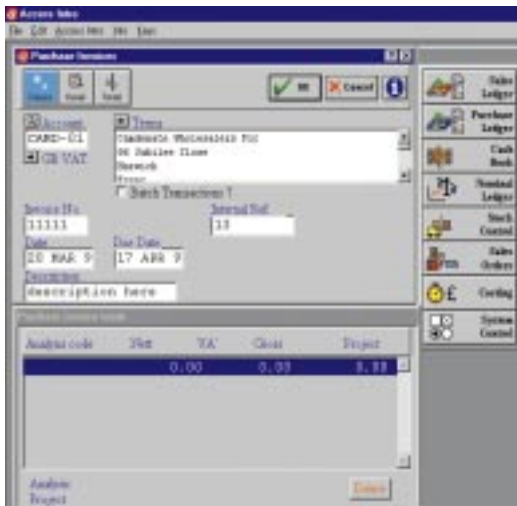
Essentially, Access is a "serious" accounting system designed for installations of up to 200 users. As such, it makes a good choice for the company that intends to grow and migrate to a full multi-user system.

The Access screens are attractive, with colourful icons and large fonts. All the data entry screens are basically the same design, which makes it easy to learn although I had trouble working out how to save a transaction.

As for data retrieval, Access is fairly traditional: there is no easy-to-use screen lists of customers and no suppliers and products with drill-down to see the detail. Neither could I find a way to amend a faulty transaction.

Auditability, however, was good with a unique transaction number being displayed on the screen and the prior-period invoice correctly appearing in this month's daybook.

Access is a "serious" accounting product of traditional design and suitable for experienced bookkeepers rather than non-accountants. Outside help from a dealer will be required to get it running.



Access has attractive data entry screens with large fonts

## PCW Details

**Price** (all ex VAT) Basic £395; additional modules £100 each; second user £200

**Contact** Access Accounting 01206 322575  
[www.access-accounting.com](http://www.access-accounting.com)

**System Requirements** Win3.1, Win95.

**Good Points** Solid auditing features. Good upward growth path.

**Bad Points** No self-teach facilities. No easy error correction.

**Conclusion** Traditional package for the experienced bookkeeper.

★★★★★

## DO\$H Cashbook

**D**O\$H Cashbook was launched in May '97 and is designed to help small businesses keep accurate records for presentation to their banks, accountants, the Inland Revenue and Customs and Excise.

No experience of bookkeeping is assumed and DO\$H produces a full listing of all bank payments and receipts, a cashflow summary, a bank reconciliation statement and a VAT account.

DO\$H is aimed at the businessperson who doesn't know much about accounting or computers but just wants to maintain their business records as simply as possible.

The manual is suitably basic and takes you through the accounts of an imaginary company. I found this didn't quite work, but it is clear that DO\$H is extremely simple and written by people who have actually worked in an accounts office. Data entry was straightforward, but I got stuck on "sub entries". The View Payments and Receipts Daybook was very good; clearly laid out, and you could drill down to a source transaction.

Date	Details	Cash	Bank
1 Day	Initials etc	50	100
2 Day	Agency commission	100	100
3 Day	Subscriptions	100	100
4 Day	Subscriptions	100	100
5 Day	Subscriptions	100	100
6 Day	Subscriptions	100	100
7 Day	Subscriptions	100	100
8 Day	Subscriptions	100	100
9 Day	Subscriptions	100	100
10 Day	Subscriptions	100	100
11 Day	Subscriptions	100	100
12 Day	Subscriptions	100	100
13 Day	Subscriptions	100	100
14 Day	Subscriptions	100	100
15 Day	Subscriptions	100	100
16 Day	Subscriptions	100	100
17 Day	Subscriptions	100	100
18 Day	Subscriptions	100	100
19 Day	Subscriptions	100	100
20 Day	Subscriptions	100	100

A good, clear Payments Daybook. But any chance of some gridlines like Excel?

Nevertheless, I could level two criticisms. The first being that bank reconciliation, a fundamental feature, is not as good as that of Quicken or Money (they sort the bank account into statement date order with a running balance, exactly duplicating the bank statement and making error detection easy). My second criticism is that the manual should make clear the position on VAT. DO\$H VAT reporting is only correct for those who are on the VAT cash accounting scheme (see *Personal Finance Packages*, p209). This

doesn't necessarily make it unsuitable for users who are not on the scheme, but nevertheless the VAT limitations should be properly explained.

All in all though, with Quicken and Money loading on more features, there is a strong need for a simple product like this, written by someone familiar with UK accounting practice. DO\$H fills the need admirably and I hope it does well.



## PCW Details

**Price** £96 (£81.70 ex VAT)

**Contact** DO\$H Software 0800 0264666  
[www.dosh.co.uk](http://www.dosh.co.uk)

**System Requirements** Windows 95.

**Good Points** Simple. Authors are experienced in UK accounting practice.

**Bad Points** Bank reconciliation is inferior to that of Quicken/Money.

**Conclusion** The simplest way to keep business records. Good.

★★★★★

Editor's Choice

Accounts packages are complicated, and even simple ones like Quicken need explanations and practice exercises to show how it all hangs together.

On the cashbook side, both Money and Quicken are beautifully designed but you have to work everything out by trial and error. If you don't have the time for this and just want a quick, simple package to record daily payments and VAT, then DO\$H is just the ticket.

Moving to the ledger-based packages, Sage, Pegasus and Access all make the mistake of assuming they can take their dealer-orientated products, cut them down a bit, then repackage them with what is basically the same manual as before. You can't do this in the retail market where users don't understand the terminology and need much more help. This is not to say that Instant Accounting, Capital Lite or Access Intro are bad products; simply that I don't see any new user having the slightest chance of successfully implementing them without outside help.

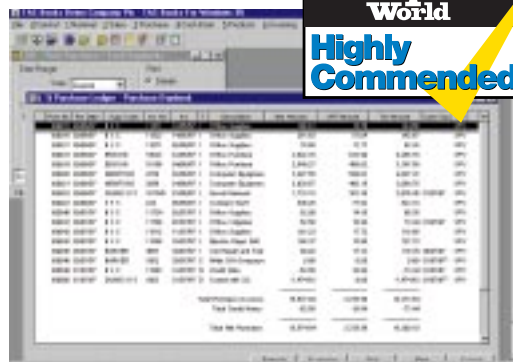
Only QuickBooks, MYOB and TAS Books for Windows have made a serious attempt to supply non-expert users with the help they need. QuickBooks is a delight to use and makes a genuine attempt to help you get your new system up and running, but provides no self-teaching materials. Worse, it is chaotic from an auditing point of view and will require an experienced bookkeeper to control it.

**TAS Books for Windows** is the best bookkeeping package in the group and has been designed by a British company that is familiar with UK specifics such as VAT. For the many users who simply want to "keep the books", this will be the best choice. Its remarkably powerful data analysis and



marketing analysis features make it equally desirable for any manager wanting to analyse sales in depth. As a result, it wins a **Highly Commended** award.

Our **Editor's Choice** rosette goes to **MYOB**. Navigation around the screens is fast, slick and logical, and non-accounting managers in particular will adapt to MYOB with ease. In terms of features and versatility it scored high marks in all areas. A superb all-rounder.



**Top Bestware MYOB (Mind Your Own Business)**  
**Above Megatech TAS Books for Windows**

Personal Computer World  
**Editor's Choice**

Personal Computer World  
**Highly Commended**

Online banking and investment

For most of us, online banking is a dream come true. No more queuing in the bank and no more complicated forms. It offers you the chance to perform nearly all your banking from the privacy of your own home, via the internet or a secure line. It's still a relatively new concept and not all banks have a service to offer at the moment, but they are working on it.

A good online banking service should offer the following functions: the ability to transfer money between accounts, pay bills, check account details, search through transactions, order cheque books and, with a bit of luck, download your banking details into a home finance package. A feature to look out for is the ability to set up transactions off-line, as this will help keep your online costs down.

- Barclays, at [www.barclays.co.uk](http://www.barclays.co.uk), has probably the best service. It is comprehensive and simple to use with either Microsoft Money or Barclays' own software. You pay £15 per year (free for the first year), plus £25 initial service fee. Others are cheaper.
- The Royal Bank of Scotland, at

[www.royalbankscot.co.uk](http://www.royalbankscot.co.uk), is free for the first six months and only £1.50 per month thereafter. Unfortunately, bill payments require that you make a phone call.

- Nationwide, at [www.nationwide.co.uk](http://www.nationwide.co.uk), runs a free service which is simple to install and runs on Internet Explorer, but has no facility for setting up transactions off-line.
- NatWest ([www.natwest.co.uk](http://www.natwest.co.uk)) will launch its service in June,
- First Direct's coming service is still in its trial stages.

**Free financial information on the net**

The internet is a great place to find free financial information. By far the best place to look is the Motley Fool site at [www.fool.co.uk](http://www.fool.co.uk) which tells people how they can best manage their investments. Another great place to look is on the Financial Times site at [www.ft.com](http://www.ft.com) which contains all the information carried in the FT newspaper.

CompuServe users have access to Business Tracker, a business information database that provides share prices, graphs,

indices, market summaries and news, free of charge. But if you're serious about your investments, another service worth investigating is Updata +20 at [www.updata.co.uk](http://www.updata.co.uk). It provides up-to-date information on share prices, indices and currencies online but makes a one-off charge. The service is licensed with the London Stock Exchange so it has access to share prices 20 minutes behind the market.

Anyone in the market for a mortgage should take a look at the Quicken web site at [www.quicken.co.uk/planning](http://www.quicken.co.uk/planning). It has a great mortgage-finder section: just enter the type of mortgage you're seeking (e.g. cash-back, first-time buyer, or 100 percent) and it'll provide you with a list of the best deals. Building society web sites also includes lots of mortgage information but bear in mind that they are trying to sell to you, so they're not the place to go for unbiased advice. Nevertheless, many of them include mortgage calculators to help you work out how much you can borrow.

Jemma Wheeler

## Personal finance packages

If you do not fall into the small-to-medium business sector, none of the packages we have reviewed will suit you. But never fear, there is a whole other category of software known as "personal finance", including Intuit's Quicken and Microsoft Money. These are cashbook packages in that you record your financial transactions not when you receive an invoice or a bill, but when you pay it. As you enter the cheque you record the amount against a category such as food, holidays, travel, and so on. Then, at the end of the month, you know where the money went.

Products like Quicken are used by individual users to track their personal finances, and by small organisations such as charities, clubs and local organisations which are not profit-orientated but still need a treasurer to keep the books. Some large businesses use them to run their petty cash ledger.

When deciding whether to use a cashbook program or a full-scale ledger-based package for your business accounting, there is a good rule of thumb: if you write your business and your personal cheques from the one bank account, use something like Quicken. But if you keep separate bank accounts, it's probably best to use a traditional package.

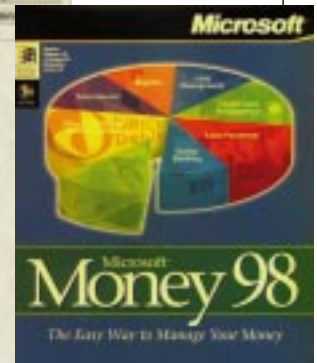
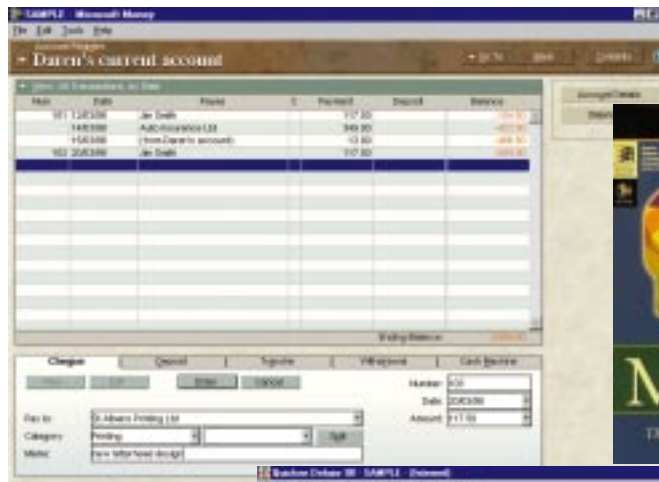
Cashbooks are simple, but remember that with such a package, sales and purchase invoices do not hit the books until they are actually paid, so it gives you no control over unpaid bills. For many businesses, control over unpaid bills is the key reason for getting an accounts program in the first place. Bear in mind also that a cashbook records VAT wrongly in that it records it *at the time of payment*. VAT, however, is due at the *invoice date*. Thus you have to be careful when preparing your VAT return otherwise you will get into trouble with Customs and Excise.

Nevertheless, there is one group which can use a cashbook program to produce its VAT returns: those businesses to which Customs and Excise have given permission to account for VAT when it is *paid* rather than when it is *invoiced*. The VAT Cash Accounting scheme, as it is called, is ideal for people like freelance consultants who have few expenses and who invoice on credit, as it means that they do not have to pay VAT on sales invoices until after their customers have paid them.

### Intuit Quicken 98

Quicken is the world's most popular personal finance package. It handles the recording of expenses and receipts through your bank account, helps you work out your taxes, will tell you the cost of a mortgage and give a valuation of your stocks and shares portfolio. If you have a modem, it will even retrieve the latest share prices, online.

I have to say, though, that I was disappointed in Quicken 98. The manual is one of the now fashionable "cookbook" variety which tells you, at the high level, all the exciting things you can do with the program but never descends to the low level to explain in detail how to do it. So, for example, the



central concepts of "accounts" and "categories" are never even discussed — Intuit assumes you understand them already. Worse, Intuit now seems to have abandoned the business user. VAT is crucial for most potential business users of Quicken, but VAT is not discussed in the manual. It's not even mentioned in the index.

Intuit is now aiming Quicken at the sophisticated, IT literate, personal user with a high net worth. But even then one doubts the extent to which a package written in the US is suitable for the UK market. For example, in the section on investment portfolio management there's no mention of calculating indexation allowances for capital gains, which would be central to any UK package.

### Microsoft Money 98

Money is Microsoft's answer to Quicken. Like Quicken, Money has an account register where you record receipts and payments and analyse them in categories. It also offers online banking services directly with your bank whereby via modem you can electronically pay bills, download bank statements or transfer money between accounts. You can also manage your Investment Portfolio and receive online share prices, as with Quicken. Money is beautifully designed and, in a number of ways, superior to Quicken but again it's all designed for the personal user.

Considering the needs of the business user, there are problems with VAT: "VAT is calculated automatically and can then be

accepted or amended" reads the manual — maybe, but it wasn't calculated automatically when I did it. In fact, when entering a transaction in Money, there seems to be no box at all for entering VAT. I spent half an hour trying to work it out but got nowhere. I probably missed something but why does it all have to be so difficult?

### What else is there?

For the business user, neither Money nor Quicken are now worthy of recommendation. Fortunately, there is an excellent alternative: DO\$H (see review on p207). It lives in a different world from Quicken and Money. It's not so polished but it is aimed squarely at the idiot-level user, its authors are familiar with UK accounting practice and it does the job.

## PCW Contacts

### Intuit Quicken 98

Price £39.99 (£34.03 ex VAT and carriage)

Contact Intuit 0181 990 5500 [www.intuit.co.uk](http://www.intuit.co.uk)

System Requirements Win3.1, Win95

### Microsoft Money 98

Price £39.99 (£34.03 ex VAT)

Contact Microsoft 0870 6010100

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

System Requirements Win3.1, Win95



Table of Features					
Name of product	Personal Computer World Highly Commended		Personal Computer World Editor's Choice		
	TAS Books for Win	QuickBooks 5.0	Instant Accounting	MYOB	Capital Lite
Price (ex VAT)	£99	£199	£84.26	£195	£84.26
Supplier	Megatech Software	Intuit	SageSoft	Bestware (UK)	Pegasus Software
Sales Tel No.	01372 727274	0181 990 5500	0191 255 3000	01752 201901	01536 495000
Web address	<a href="http://www.megatech.co.uk">www.megatech.co.uk</a>	<a href="http://www.intuit.co.uk">www.intuit.co.uk</a>	<a href="http://www.sage.com">www.sage.com</a>	<a href="http://www.myob.co.uk">www.myob.co.uk</a>	<a href="http://www.pegasus.co.uk">www.pegasus.co.uk</a>
Operating system	Win95	Win3.1 / Win95	Win3.1 / Win95	Win3.1 / Win95	Win3.1 / Win95
Recommended memory	16Mb	16Mb	16Mb	16Mb	16Mb
Hard-disk space	25Mb	42Mb	40Mb	24Mb	15Mb
<b>Modules</b>					
Cash	●	●	●	●	●
Sales / purchase / nominal ledgers	●	●	●	●	●
Sales invoicing	●	●	●	●	●
Purchase invoicing: expense analysis	●	●	●	●	●
Purchase invoicing: product analysis	○	●	○	●	○
Purchase invoicing: job analysis	●	●	○	●	●
Stock control	○	●	○	●	●
Parts explosion	●	○	○	●	○
Suitability for each type of company					
Distribution co: doesn't need to track product costs	Good	Good	Fair	Good	Fair
Distribution co: needs to track product costs	Poor	Good	Poor	Good	Poor
Services co	Good	Good	Good	Good	Good
Jobbing co: doesn't need to track product costs	Fair	Good	Fair	Good	Fair
Jobbing co: needs to track product costs	Poor	Fair	Poor	Good	Poor
<b>Ease of use</b>					
Transaction entry	Fair	Good	Good	Good	Fair
Access data once entered	Good	Good	Good	Good	Fair
Correct errors	Good	Good	Good	Good	Poor
Cross-reference to source documents	Good	Poor	Fair	Fair	Fair

Table of Features				
Name of product	Access Intro	DO\$H	Money 98	Quicken 98
Price (ex VAT)	£395 (basic)	£81.70	£34.03	£34.03
Supplier	Access Accounting	Dosh Software	Microsoft	Intuit
Sales Tel No.	01206 322575	0800 0264666	0870 6011000	0181 990 5500
Web address	<a href="http://www.access-accounts.com">www.access-accounts.com</a>	<a href="http://www.dosh.co.uk">www.dosh.co.uk</a>	<a href="http://www.microsoft.com">www.microsoft.com</a>	<a href="http://www.intuit.co.uk">www.intuit.co.uk</a>
Operating system	Win3.1 / Win95	Win3.1 / Win95 / Win NT	Win95 / Win NT	Win3.1 / Win95
Recommended memory	16Mb	4Mb or 8Mb	16Mb	16Mb
Hard-disk space	17Mb	2Mb	20-55Mb	26Mb
<b>Modules</b>				
Cash	●	●	●	●
Sales / purchase / nominal ledgers	●	○	○	○
Sales invoicing	●	○	●	○
Purchase invoicing: expense analysis	●	○	○	○
Purchase invoicing: product analysis	○	○	○	○
Purchase invoicing: job analysis	●	○	○	○
Stock control	●	○	○	○
Parts explosion	○	○	○	○
Suitability for each type of company				
Distribution co: doesn't need to track product costs	Good	n/a	n/a	n/a
Distribution co: needs to track product costs	Poor	n/a	n/a	n/a
Services co	Good	n/a	n/a	n/a
Jobbing co: doesn't need to track product costs	Fair	n/a	n/a	n/a
Jobbing co: needs to track product costs	Poor	n/a	n/a	n/a
<b>Ease of use</b>				
Transaction entry	Good	Good	Good	Good
Access data once entered	Fair	Good	Good	Good
Correct errors	Poor	Good	Good	Good
Cross-reference to source documents	Good	Fair	Fair	Fair

Key: ● Yes ○ No



# The fast show

Catch 'em while you can: Nik Rawlinson reports from the business end of four of the first 400MHz machines to hit the market, from Carrera, Dan, Gateway and Hewlett-Packard.

Just three months ago, Intel's 333MHz Pentium II processor had its PCW debut. How quickly things change: this month, we profile four of the first lightning-fast 400MHz PCs on the market. Utilising beta versions of the new BX chipset on pre-production motherboards, these processors tore through our rigorous benchmark tests, thanks largely to the first 100MHz motherboard bus speeds.

The 400MHz processor is a member of the Deschutes family, in which the 0.25 micron technology enables lower power consumption and, consequently, less heat generation. This is also the way in which Intel manages to make the chips run so fast: as its component parts are closer together, it takes less time for the instructions to travel from one place to another. An AGP slot comes as standard with these machines (with the exception of the Hewlett-Packard), freeing up valuable expansion space and allowing us access to the fastest graphics interface on the

market. We have taken a detailed look at what Intel's new 400MHz processor can do for you, and put four pioneering machines under the microscope.

## Carrera Power Pro II-400

The large tower case of this Carrera machine offered plenty of opportunities for expansion. Of the six free drive bays, only two 3.5in slots remained vacant. The hard drive was mounted in a removable tray in one of the 5.25in bays, so for those with security in mind, this machine would be a good choice. The drive could be removed at night, so even if your expensive hardware went missing, you would still have your (irreplaceable) data.

At 8.5Gb this drive looked to the future and the next generation of resource-hungry applications, while the SCSI interface, also used by the 32-speed Toshiba CD-ROM drive, ensured the fast processor was not held back by the machine's other components. Further storage capacity was in the form of an Iomega Jaz drive offering

1Gb backup capacity on the bundled cartridge.

The 64Mb SDRAM was supplied across two modules, leaving a further slot free for expansion. Without removing what was already installed, we could take our allocation to a maximum of 192Mb.

Running Windows NT 4 Workstation as its operating system (although the disks supplied were for Windows NT Server), this PC would be suitable for use in networked environments, for which the 10/100 network card catered. No modem was included, but that is not surprising in a machine incorporating a network card.

Graphics were supplied by a Matrox Millennium II and with 8Mb RAM on-board we were impressed by the results. (The more dedicated memory a card has at its disposal, the higher the resolution and the greater the number of colours.) Once we had set the refresh rate to 85Hz, the Iiyama Vision Master 450 monitor demonstrated the usual high quality we have come to expect from this manufacturer. The 19in

**(Right) Carrera's Power Pro II-40: Jaz, speakers and network-ready**

tube had a visible diagonal of 18in, making it perfect for graphics-intensive applications and GUI use. A good on-screen display catered for a range of image alteration options, including degauss and pre-set colour temperatures.

**Price** £3,049.13 (£2595 ex VAT)

**Contact** Carrera 0171 830 0486  
[www.carrera.co.uk](http://www.carrera.co.uk)

**Good Points** SCSI. Removable HD.

**Bad Points** Maybe a little pricey.

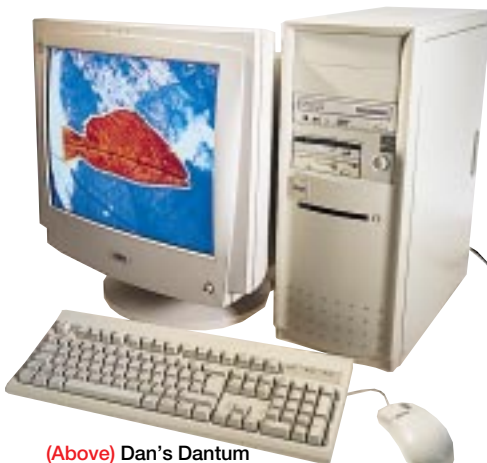
**Conclusion** Well worth considering

★★★★☆

**Dan Dantum II/AS598**

The Dan machine was supplied with plenty of added goodies. The Zip drive was accompanied by two free disks and the generous software selection included a variety of Microsoft products, ranging from Encarta to The Magic Schoolbus, and Serif Page Plus Home/Office Edition. Microsoft Works was pre-loaded but the installation disks had not been included, while the more extensive Lotus SmartSuite was both pre-loaded and supplied on CD. There was even a DVD drive thrown in: the Creative Labs Dxr2 (*PCW February*).

The Pace 56K Voice modem is bundled with the 28-day Pipex trial, while the keyboard and mouse were high quality. The



**(Above) Dan's Dantum sports DVD and MPEG**

64Mb RAM came on two DIMMs, leaving one slot free for expansion, but the number of PCI expansion slots was limited by an MPEG card in one of the PCI slots even though the ATI All-In-Wonder Pro AGP graphics card had this on-board. But the All-In-Wonder has a TV tuner with teletext, video capture and 3D graphics handled by the 3D Rage chip all on one card. Sound came from a SoundBlaster AWE64 through 300W Yamada speakers with a subwoofer.

The 19in Dan-branded ADI MicroScan 6P monitor offered a steady, sharp, clear picture with an easily navigable and extensive on-screen display. Brightness and contrast controls had wisely been kept separate from the OSD and were instead controlled by rotary dials for immediate access. The three preset colour temperatures are supplemented by no less than three further user-definable levels.

**Price** £2,447.53 (£2,083 ex VAT)

**Contact** Dan 0181 830 1100 [www.dan.co.uk](http://www.dan.co.uk)

**Good Points** All-In-Wonder Pro.

**Bad Points** Second, unnecessary MPEG card.

**Conclusion** A PC with all the trimmings.

★★★★☆

**Gateway G6-400XL**

Gateway machines always arrive in attractive cases and this was no exception. Three free external 5.25in drive bays offered plenty of opportunity for expansion, while internally a vertical shelving system allowed us to add three hard drives to complement the 8.4Gb IBM EIDE drive. Production models of this machine will ship with 128Mb NVRAM but our test machine had only 32Mb (the first model we have seen to have this type of RAM), so end-users could expect better benchmark results than those achieved here.

With 4Mb on the graphics card, the STB Velocity 128 was only adequate. Fortunately the 32Mb RAM was supplied on just one DIMM, so two further vacant slots offered expansion possibilities.

As expected, the standard setup included a couple of USB ports, looking forward to the day when peripherals for this

interface become more commonplace. The inclusion of a DVD drive rather than the conventional CD-ROM meant users won't have to upgrade to this new format when it becomes more widespread throughout 1998. The common floppy drive has been replaced by an Imation SuperDisk, offering up to 120Mb on an LS120 disk while being able to read and write standard capacities to a 3.5in floppy.

To avoid filling an extra ISA slot, Gateway put the Ensoniq sound chips on-board. They drove a pair of stylish but large Boston Acoustics speakers. An internal 33.6Kbps US Robotics modem was included, as was a microphone to transform it into a hands-free telephone.

The user-friendly EV900 monitor had a sharp, clear image with the minimum of reflection. The on-screen display was quite simply one of the best we have ever seen. It could be positioned anywhere on the screen so it would not get in the way of anything on our display. There were three colour-temperature pre-sets complemented by individual variables for the red, green and blue values.

A choice of interface languages and



**(Above) Gateway's G6-400XL features the début of NVRAM**

a series of user-definable options make this monitor particularly user friendly. The ordinary pincushion setting was supplemented by a "bow" option, which pushed the horizontal centre of the image to the left or right.

**Price** £2,818.83 (£2,399 ex VAT)

**Contact** Gateway 0800 552000  
[www.gateway2000.co.uk](http://www.gateway2000.co.uk)

**Good Points** 128Mb NVRAM. Monitor.

**Bad Points** None to speak of.

**Conclusion** Looking to the future.

★★★★☆



## Under development: the next generation of processors

Intel continues to dominate the PC processor market and the signs are it has no intention of relinquishing any sector of that market to any of its rivals. Its current strategy is, rather than simply make new microprocessors for the fastest computers and wait for them to move down the food chain, Intel will now tailor each of its new chips to a specific class of machine. From the fastest, most expensive servers to the most basic £700 PC, Intel will aggressively sell the Pentium II.

By the autumn it will have in place a range of processors suitable for just about every category of desktop PC. The chip giant is reinforcing its grip on the entry-level desktop market with its forthcoming Pentium II variant, now called Celeron. However, it looks likely that Celeron, which ships *sans* the L2 cache, will be at a performance disadvantage to those chips made by Intel's rivals, Cyrix, AMD and IDT/Centaur, which all compete both on price and performance. These manufacturers, while denied access to the Pentium II's Slot 1 technology, will continue to use the tried-and-tested Pentium socket, Socket 7, which helps keep costs down.

Here's a rundown of some of the developments and announcements we can expect in the processor arena.

### ■ Entry-level processors

**Intel Celeron** Codenamed Covington, the recently announced Celeron is Intel's offering for the new "Basic PC" class of very low-cost PCs. Due to ship in Q2 of 1998, it's a straight rehash of the 266MHz Pentium II processor, using the Deschutes core but with the L2 cache removed. Celeron will ship in a single-unit, single-edge processor package and in bulk-pack boxes with a clipped-on fan heatsink and a single-metal clip. Intel will also provide a stripped-down version of the 440LX chipset, the 440EX, which supports only two DIMM slots with 256Mb RAM and three PCI slots. A new motherboard form-factor will partner the new CPU, the microATX.

**Centaur C6 WinChip** Launched late last year, the C6 WinChip is another Pentium-compatible processor aimed at the new breed of low-cost PCs. The C6 is a single-issue, non-superscalar design like the 486. But by using a Pentium bus, a large on-chip cache, and a refined pipeline design, it can achieve Pentium-like performance. Like the K6 and 6x86MX, it has 64Kb of on-chip cache, it is Pentium pin-compatible and it implements the

MMX extensions. The C6's biggest weakness, like the K6 and the 6x86MX, is its floating-point and MMX performance. An enhanced version is in the works that addresses these issues, doubling the chip's performance.

The new 300MHz C6, called the C6-MX, is due in the first half of 1998 and will add yet another variant of 3D acceleration instructions. Later in the year, IDT plans to add a version with an L2 cache. The C6-MX (aka C6+) includes 53 new x86 instructions which will be supported in future Direct3-D API releases. The new CPU will support 75, 83 and, later, 100MHz bus speeds.

**Cyrix MediaGX** The MediaGX was the first CPU to exploit the entry-level PC niche. Unlike other processors, this chip provides a higher level of on-chip integration than anything Intel offers, including graphics controller, DRAM controller and PCI-bus interface. As a result the chip, which is based on the old 5x86 CPU core, isn't Pentium pin-compatible and so requires a custom motherboard design. It's cheap, but it doesn't offer cutting edge performance and lacks support for things like USB, MMX and 3D graphics, so is unattractive to gamers.

Cyrix plans to upgrade the MediaGX steadily, keeping pace with Intel's gradual phasing out of its low-end Pentium MMX CPUs. Originally running at 120 and 133MHz, it recently introduced MediaGX processors at 200 and 233MHz. An entirely new processor, the MXi, is also promised. This combines the Cayenne core with an on-chip 3D accelerator, memory controller and PCI interface. This promises to deliver much better performance, including 3D graphics and DVD support.

### ■ Mid-range processors

**Intel Deschutes** Deschutes is a 0.25-micron version of the Pentium II, offering similar features and marketed under the Pentium II name but with internal clock speeds in excess of 333MHz, with processors running at 450MHz soon to be announced and system-bus speeds of up to 100MHz. The 333MHz version runs on a 66MHz bus, but since the chip supports only integer and half-speed clock multiples the 100MHz bus won't work with a 333MHz CPU. Versions that use the

100MHz bus operate at CPU speeds of 350, 400, 450 and so on. The 100MHz bus requires a new chipset, the 440BX. The BX is noteworthy for its 100MHz "front side" bus which



passes through the Slot 1 connector. The increase from the 440LX's 66MHz connection will provide a faster interface to core-logic components, such as I/O and system memory.

Current Pentium II processors plug into Slot 1, which defines a connector and a form factor. Intel will offer Deschutes in both the current Slot 1 and the new Slot 2 formats. Slot 2 supports up to four processors, twice as many as Slot 1, and has physically larger modules. The latter change allows Intel to put more cache RAM on the module, allowing for much larger caches than the current 512Kb. These key changes position Slot 2 processors for servers and high-end workstations rather than desktop PCs. These products will benefit from the higher bandwidth of the L2 cache bus. Note that Slot 2 complements Slot 1 but doesn't obsolete it.

Deschutes is also the first Pentium II processor for mobile systems, being sold in one of two form factors — either as a Mobile Module or as a new mini-cartridge, similar to the current Pentium II cartridge but one third of the size. Intel's first Pentium II chips for portables offer 266MHz clock speeds with 300MHz available in late summer. The chips are coupled with a mobile-specific version of the forthcoming desktop 440BX chipset.

Early in the third quarter Intel will introduce a 400MHz Pentium II chip that supports Slot 2, a server and high-end workstation-only architecture. All Slot 2-based Pentium II processors will support a 100MHz bus as well as a larger and faster Level 2 cache. Intel is also working on technology to increase symmetric multiprocessing servers from four to eight processors and beyond.

**Intel Katmai** The Pentium II will be superseded by Katmai next year. The Katmai platform involves the convergence of new chipsets, DRAM technology, a graphics bus,

**Pictured: (left) Intel Pentium II (above) Digital Alpha (right) Cyrix 686**



MMX instruction set, graphics components and perhaps a faster system bus. Katmai will be a P6 derivative that initially will be produced on a 0.25-micron process, with up to 512Kb of L2 cache. It will start out at 450MHz (where Pentium II ends) and leap up to as much as 750MHz in 2000 with Intel's 0.18 micron process. Details of the processor architecture are scarce, but analysts predict it will stick with a 64-bit CPU bus and rely on deeper pipelining capabilities to take advantage of wider buses and encourage the use of multiprocessing.

It will come with 70 single-instruction, multiple-data (SIMD) floating-point instructions to accelerate 3D processing. Intel's current MMX instruction set is based on SIMD integer data types. Useful for presenting certain audio, video and 2D images, they provide less precision and range for 3D geometry processing. Supporting a 4x mode of the Accelerated Graphics Port (AGP), peak graphics bandwidth will reach 1Gb per second, up from 532Mb per second with current AGP solutions.

**Intel Willamette** A refinement of Katmai, Willamette, expected in the new millennium, will probably be the x86 architecture's last gasp. It is expected to reach speeds of 1.2GHz or 1200MHz on 0.13-micron technology.

**AMD K6** AMD will upgrade the K6 in two phases. During the first half of 98, a revamped K6 will offer three main improvements. The Socket 7 replacement, Super 7, will run at 100MHz, speeding access to the off-chip L2 cache and main memory. The K6 will acquire a second MMX unit, making the chip more competitive with the Pentium II and MMX Pentium which already have dual MMX units. But the biggest change will be the inclusion of an AMD-defined set of 24 3D acceleration instructions, AMD-3-D. These instructions will let the chip perform more than one floating-point operation per clock cycle. However, the standard floating-point instructions in the enhanced K6 will still be slower than Intel's, and only software written specifically for AMD-3D instructions will benefit. Towards the end of this year, AMD will offer a 0.25-micron K6 version with a 256Kb L2 cache.

**Cyrix Cayenne** Mirroring AMD's enhanced K6, Cyrix's revamped 6x86MX core, codenamed Cayenne, will support a 100MHz bus and add dual MMX units. It will also add its own parallel floating-point instruction set, called MMXFP, for handling 3D geometry. This is similar to AMD's K6 proposals, but incompatible. Cyrix hasn't disclosed its bus or L2 cache strategy, and chips using the Cayenne core won't necessarily be Socket 7-compatible.

#### ■ High-end processors

**Intel Merced** For enterprise-class systems,

Intel will ship its first-generation IA-64-based processor, known as Merced, in the second half of 1999. Jointly developed with Hewlett-Packard, Merced will also offer 32-bit software compatibility. The new IA-64 Merced promises to shake up the industry by supporting both Intel and PA-RISC binaries natively.

Merced, with initial speeds expected around 800MHz, is based on 0.18-micron technology and is expected to be expensive at introduction, with prices possibly as high as \$4,000, according to US sources.

Successive shrinks, first to 0.13-micron then down to 0.10-micron five years hence, will however bring Merced prices down to high-street levels.

The first Merced will be a cartridge-style module that packs a CPU fabricated in 0.18-micron CMOS and an L2 cache and bus interface, but not control logic, according to Intel. The cartridge will employ a newly defined system bus, using concepts from the Pentium II bus with adaptations to Merced's unique interrupt and multi-processing protocols.

Merced's most notable characteristic is its massive complement of registers: 128 integer, 128 floating-point and 64 new "speculative" registers for the compiler to work with. This aids performance by obviating the need for the compiler to perform cumbersome register-renaming tasks.

Merced also supports EPIC (Explicitly Parallel Instruction Computing). While most of today's 32-bit chips allow processors to execute four tasks at once, or in parallel, EPIC would expand parallelism without taking up more room on the microprocessor. That's because EPIC takes the complexity of parallelism out of the processor and allows the compiler to perform those tasks outside of the hardware. Quasi-VLIW technology will put three instructions of about 40 bits apiece into a very long instruction word 128 bits long. The chip is thus able to execute the instructions in parallel, which makes the compiler more responsible for peak performance than the chip design. The instructions have to be placed into each word precisely to optimise performance, and words with instructions that depend on each other are to be avoided. Current programs will have to be recompiled for Merced, and hybrid Intel RISC/CISC machines will not arrive until legacy applications are ported with the new compilers, which will likely take some time.

**Intel Tanner** The Tanner CPU offers computer manufacturers a halfway house on the road to Merced. It will be a 32-bit CPU that fits in the new "Slot M" connector that will eventually house Merced. It's been associated with Slot 2 as well, indicating that the Tanner chip would be designed to function in 32-bit and 64-bit computers.

The Slot M connector will be incorporated into a 460GX chipset, among others. The 460GX's features include the capability to run four processors in parallel, address 16Gb of RAM and interface to an AGP 4X high-power connector.

**Digital Alpha** The Alphas are the fastest of all the RISC processors and the only ones for which Microsoft Windows NT support has been maintained (NT support for MIPS and PowerPC being dropped last year).

Today's Alpha processor is the 21164, which Digital offers at clock speeds from 300 to 600MHz. On integer applications the performance gain over the Pentium II isn't as great as the clock speed would suggest. The actual performance advantage varies greatly depending on the application, but for floating-point applications such as 3D graphics and computer-aided design, the 21164 is a stellar performer.

The 9.6 million-transistor 21164 has 16Kb of on-chip Level 1 cache plus 96Kb of on-chip Level 2 cache. The system bus is 128 bits wide, enabling it to deliver higher bandwidth than the 64-bit bus in x86-based systems.

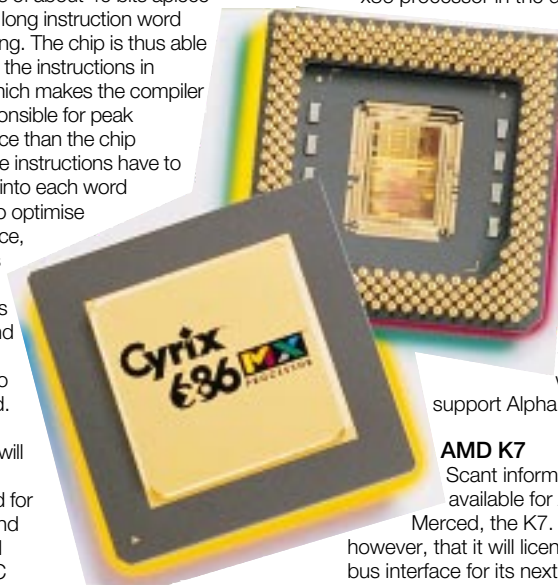
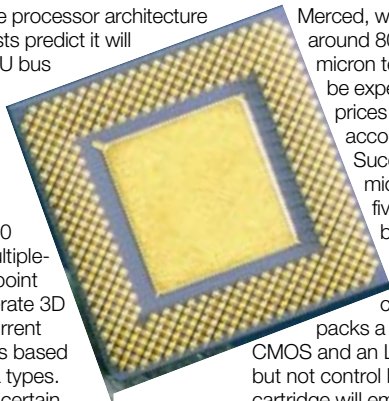
Most Alpha systems are far more expensive than typical PCs. Digital is sampling a new processor, called the 21164PC, that is less expensive than the original 21164 yet delivers nearly as much performance. It will be offered at clock speeds of 400, 466, and 533 MHz. Next year Digital plans to begin shipping the 21264, which should leave even Intel's best x86 processor in the dust, especially in floating-point performance.

Digital last year sold manufacturing and research facilities for the chip to Intel, part of the settlement of a patent-infringement lawsuit. What that means for the future of Alpha is unclear. Digital maintains it means nothing and that the company will continue to support Alpha systems.

#### **AMD K7**

Scant information has been made available for AMD's 64-bit rival for Merced, the K7. AMD has announced, however, that it will license the Alpha 21264 bus interface for its next-generation K7 processor, codenamed Argon. This will physically fit a Slot 1 connector but won't be electrically compatible with it.

Roger Gann



(Right) HP's Vectra VL is sturdy and well built



**Hewlett-Packard Vectra VL**

One of the most useful extras for corporates is fast access to the motherboard; in this system it will slide out at the flip of a switch, leaving the rest of the components in place. The expansion cards are positioned vertically on a daughtercard at the top of a tower case. Most of the slots double up, resulting in three shared slots rather than the single one. This means access to the rear slots is not as immediate as with a conventionally laid-out PC, but they are held in place by a bar rather than six individual screws. At the top, a slimline airflow guide system channels air to the processor, ensuring it is kept cool.

The high-quality keyboard has buttons for mute, volume control and standby, and a set



of user-configurable hotkeys to initiate software functions. The mouse is HP's comfortable version of the scrolling wheel design. Graphics were handled by an on-board Matrox Productiva G100 chip with a maximum of just

4Mb graphics memory, but the 64Mb SDRAM and 32-speed CD-ROM ensured that in other areas, the HP worked fast.

Free bays were limited, with only two external 5.25in options, but they were supplemented by two 3.5in internal bays left vacant for additional hard drives. Access to devices in these bays was a breeze thanks to a rear access door in the case.

There were no bundled speakers, but sound was provided by an Aztec card which sat next to the only other expansion card, a 3Com 10/100 network card. The hard drive was a 10.1Gb Ultra ATA IBM model; because of the setup under Windows NT 4.0, only 8.4Gb was at our disposal.

The M900 monitor had an impressive array of buttons, each giving access to two functions and, with its own small OSD, was easy to navigate. Immediate access to the degauss function kept the picture steady, and the image produced was sharp and pleasant throughout our tests. There were three colour-temperature presets.

**Price** £2,353.53 (£2,003 ex VAT)

**Contact** Hewlett-Packard 0990 474747 [www.hp.com](http://www.hp.com)

**Good Points** Well thought-out construction.

**Bad Points** Hard-drive configuration.

**Conclusion** The one to buy.

★★★★★

**Conclusion**

The PCs tested here, four of the first in their class, demonstrated the awesome power and speed of the 400MHz processor and the BX chipset: we were impressed by the speed increase of as much as 31 percent. Although some of these machines were using beta versions of the BX chipset, which would at this stage impair their performance, one is head and shoulders above the rest for build quality alone: the Vectra VL. HP has showed how innovative design can produce a superb product.

Performance results

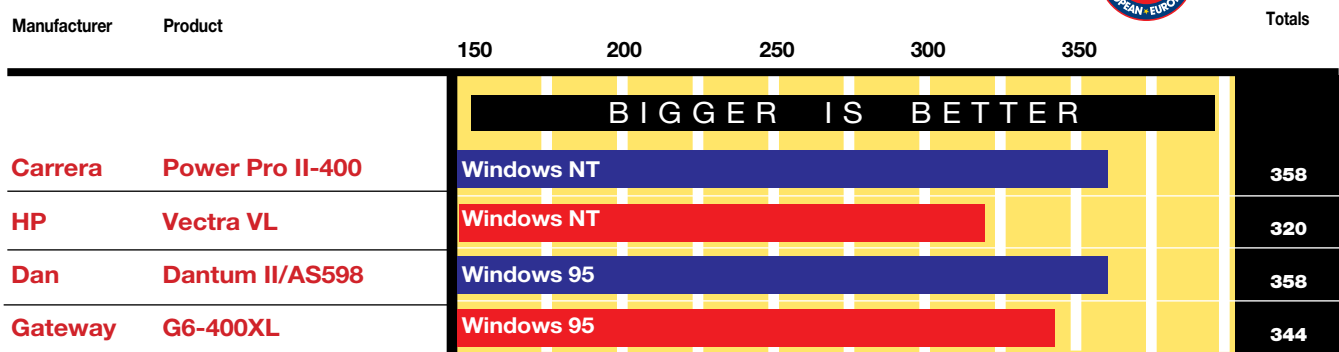


Table of Features



Manufacturer	Carrera	Dan	Hewlett-Packard	Gateway
<b>Model</b>	<b>Power Pro II-400</b>	<b>Dantum II/AS598</b>	<b>Vectra VL</b>	<b>G6-400XL</b>
Telephone	0171 830 0486	0181 830 1100	0990 474747	0800 552000
URL	<a href="http://www.carrera.co.uk">www.carrera.co.uk</a>	<a href="http://www.dan.co.uk">www.dan.co.uk</a>	<a href="http://www.hp.com">www.hp.com</a>	<a href="http://www.gateway2000.co.uk">www.gateway2000.co.uk</a>
Price inc VAT	£3,049.13	£2,447.53	£2,353.53	£2,818.83
RAM	64Mb	64Mb	64Mb	128Mb
Type	SDRAM	SDRAM	SDRAM	NVRAM
Size/interface	8Mb/8.5Gb/Seagate Cheetah 9	8Mb/8Gb/IBM	4Mb/10.1Gb/UltraATA/IBM	4Mb/8.4Gb/EIDE/IBM
Graphics card	Matrox Millennium II	All-In-Wonder Pro	Matrox Productiva G100	STB Velocity 128
Sound card	Creative Labs AWE64	Creative Labs AWE64	Aztech	Ensoniq (on-board)
Network card	10/100	None	10/100	None
Monitor	19" Iiyama Vision Master 450	19" Dan	19" Hewlett-Packard M900	19" Gateway EV900
Operating system	Windows NT4	Windows 95	Windows NT4	Windows 95



# Meta marvels

Your home PC could help solve the secret of life, the universe and everything. Join the GIMPers and be part of a huge metacomputer, writes Toby Howard.

**J**ust over a year ago, *Futures* reported on a huge parallel supercomputer called TFlops, then undergoing installation at the Sandia National Laboratories in New Mexico <[developer.intel.com/technology/itj/](http://developer.intel.com/technology/itj/)>. Now in full operation, it's the most powerful supercomputer on earth. A gargantuan ensemble of over 9,000 interconnected Pentium Pros, it routinely clocks over 1.3 million megahertz, occupies a huge room, requires full-time supervision and consumes the same amount of power as a small town. But it may be



It could be "Goodnight Vienna" for the gargantuan TFlops parallel supercomputer. The humble home PCs of the world, linked via the web, have a vast reserve of computational power which could be harnessed

the last of a dying breed. There's the prospect of a new kind of massively parallel supercomputer which may have capabilities beyond our wildest imaginations. And you could be part of it.

The idea is to make use of the vast computational power wasted daily while thousands of PCs around the world are doing nothing. While we sleep or take coffee breaks, our machines mostly sit idle or run screensavers whose processing requirements have little impact on today's CPUs. With an estimated 30 million machines on the web, that's a lot

of virtual power. If it were harnessed, the web could become a huge distributed computer; a "metacomputer".

Metacomputing is widespread in research laboratories, where programs with huge memory and processing requirements are carved up between local computers, whose individual results are stitched together to form the overall solution. In the lab, where each machine has access to a shared file system and a local high-speed network, metacomputing is easy. But on the web, it is far more difficult, but not impossible.

The problem to be solved is split into thousands of smaller, more manageable problems, each of which is allocated to a volunteer. Using software and data downloaded from a Problem Server, each small-scale problem can be solved offline and its results returned to the Server, which acts as a computational clearing house.

## Prime time

One of the first metacomputing projects was GIMPS: the Great Internet Mersenne Prime Search <[www.mersenne.org](http://www.mersenne.org)>. A number is prime if it can only be divided by itself and 1. For example, the first few primes are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29. Although Euclid proved that there are infinitely many prime numbers,

there is no known method for generating them: you have to search for them.

Certain kinds of number are more likely to be prime than others, such as numbers of the form  $2^N - 1$ , where  $N$  is prime. Primes of this kind are called Mersenne primes, after the 17th century French monk who first described them. He knew 11 such numbers. Now we know 37 of them, and GIMPS recently discovered the latest two.

GIMPS volunteers (GIMPers) worldwide are given specific numbers to test for primality. When I joined, for instance, I was allocated  $2^{4745401} - 1$ , and my 200MHz Pentium will take about 20 days of background computation to check whether it's prime or not. Since the software runs at the lowest priority, it only steals CPU cycles when you're not doing something more important.

Another successful metacomputing project tries to crack codes, but it is legal. In order to demonstrate the security (or otherwise) of various encryption schemes, RSA Data Security <[www.rsa.com](http://www.rsa.com)> has published a number of cryptographic puzzles, offering prizes for their solution. In February, a team of 22,000 volunteers with access to 50,000 CPUs solved the problem in 39 days <[www.distributed.net](http://www.distributed.net)>. A year ago, a similar puzzle took twice as long to crack; metacomputing is maturing.

## Life science

Perhaps the most exciting application of metacomputing is the SETI@home project <[www.bigscience.com](http://www.bigscience.com)>. The brainchild of Dan Werthimer at the University of California, SETI@home is designed to answer the Big Question: "Is there life out there?" Since the seventies, the Aricebo Observatory in Puerto Rico has hosted a project to hunt for intelligent signals hidden in the cacophony of deep-space radio waves. But the specialised search equipment, which works in real-time, can check only a tiny set of wavelengths for signals which might be intergalactic "Hellos".

This is a problem tailor-made for metacomputing. Recordings of the radio noise will be placed on a Problem Server, and volunteers will download chunks to process with their SETI@home analysis software. Alas, although technically sound and all ready to go, SETI@home is on hold due to lack of funds.

Web metacomputing has the potential to be a great democratiser of science. In many fields, discoveries would no longer be confined to computing labs. The drudgery of scientific calculation could be shared out among the world's PCs. Everyone would get the chance to make their mark, solving problems, discovering new results and perhaps even finding signals from an alien civilisation. It'll be a high-tech lottery, but like that bloke on the telly says, "It could be you". ■

# Let's get **digital**

A wide range of quality TV programmes to view at your convenience. Too good to be true? Adele Dyer tunes in to the current development work behind digital TV.

**D**igital television is the epitome of vapourware. It has been widely hyped, especially by those in the television industry, as the greatest revolution since the invention of film. There is very little chance of it making an appearance on our screens for some time, but there has been a lot of work going on "behind the screens" to agree the standards and work out precisely how this so-called revolution is going to affect our viewing habits.

Digital TV is not about improved quality of the image we see, but rather, a question of wider choice. In the bandwidth taken up by one analogue signal you can fit ten digital signals, so between terrestrial, satellite and cable transmissions the number of channels available to broadcasters will increase to around 200 channels.

The Independent Television Commission is currently setting up three digital multiplexes offering between three and five channels each. So, ITV and Channel 4 has one multiplex, the BBC one other and the third is open to bids from the private sector. The BBC plans to offer digital widescreen broadcasts of BBC1 and BBC2, 24-hour news, and a new channel carrying programmes to complement the output on existing channels, which could mean anything from extended sports coverage to documentaries giving background on drama series.

However, as more channels become available via cable and satellite, and if "choice" is to exist in the true meaning of the word, rather than merely a load of useless channels broadcasting unwatchable rubbish, a great deal of thought has to go into offering viewers just what they want, when they want it.

## The TV times they are a'changing

The BBC is obliged by its charter to support digital broadcasting, and as a result it is gearing up for a service which will offer the viewer a wide range of programmes already broadcast by the BBC but in a format and at a time to suit the viewer. The system will carry more than just a back catalogue. It will also feature movies, music and local and national news on demand, and live sporting events. It will also give viewers the opportunity to see whole or part programmes. The introduction of such a service will mean massive changes, not only in how programmes are scheduled and shown, but also in how rights will be affected and how programmes are made in the future.

The service is, as yet, only in its rudimentary trial stage and is being shown to programme schedulers and rights people, as well as to programme makers and commissioners. However, the infrastructure, or backbone of how programmes are selected and shown, has pretty much been worked out already, as well as how they might be presented to the viewers.

The look of the service is a cross between CD-ROM and the internet, with a graphics-intensive interface. The trial we saw looked extremely easy to use and navigate. The main screen has a range of icons across the top, covering general subjects such as sport, documentary, drama, news, education, comedy and opinions. When you make your suggestions, these lead on to other screens offering more detailed choices.

The interface allows for some clever and intuitive ways to pick the highlights you want to see, including picking football teams by their strips and specifying, say, that you only want to see the goals or the fouls. Similarly, if you pick any kind of drama, you can choose to see specific scenes from a list presented to you, or only those scenes with

certain characters. You can even do a word search to find a programme, so if you vaguely remember an episode from *Fawlty Towers* which had something to do with a rat, you can find it. This facility is especially useful for local news: you can pick only those stories which will be of interest to you. Once the programme is running, you can stop it at any point as you would a video so you do not have to miss it again because the phone rings or visitors drop by unexpectedly.

## Broadcast news

This is made possible by the addition of information to be stored with the programme as it is digitised: the operator transferring the analogue film into a digital format can add metadata and make notes on scene content, add search keywords, note the characters in each scene, and create pages of background information to supplement the programme. Such a system would have to be broadcast over a broadband network, either satellite or cable; the latter, with its bi-directional capacity, seems the obvious choice. You will also need a set-top box and an IR pointing device and keyboard, or a touch-screen system.

The proof of the pudding will not just be the speed and reliability of the system, but whether the viewer can make sense of what is on offer and so have their level of pleasure raised, rather than squashed under the weight of too much choice. ■



Select your chosen Proms concert from an interactive screen

# 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](mailto:pcw@vnu.co.uk).

## **Workshop**

### **Client-Server Databases — Part III 229**

Mark Whitehorn shows you some wizardry to smooth the path from Access to SQL Server.

## **Operating Systems**

### **Windows 95 242**

Do you speak Nerdish? Probably not. Tim Nott, our multilinguist on the sidelines, translates the boot log problem list into a language we can all understand.

### **Windows 3.1 246**

Panicos Georghiadis and Gabriel Jacobs turn colourful to tackle settings and graphics cards.

### **Windows NT 250**

What a lovely profile! Andrew Ward shows his best side, with an in-depth study of user profiles.

### **Unix 255**

Another road to tar. Chris Bidmead takes the route which leads to the assembly of a simple shell script.

### **OS/2 259**

Whoopie for Warp fans and the *PCW* CD-ROM — Terence Green proudly presents Fix Pack and JDK.

## **Applications**

### **Word Processing 262**

Tim Nott is into the numbers game for unnumbered paragraphs in numbered lists and the like.

### **Spreadsheets 266**

Take a raincheck and follow Stephen Wells' guide to putting weather together on a spreadsheet.



### **Databases 270**

Mark Whitehorn un.masks postcodes and advises on formatting offers of money.

### **Sound 278**

Channel hopping with VST, and the beat goes on with Hammerhead and Stomper.

### **Graphics & DTP 282**

Ken McMahon gifts you seven frames of animation for viewing on the web.

### **3D Graphics 288**

Fun and games can be yours. Benjamin Woolley advises wannabee games producers.

## **Programming**

### **Visual Programming 290**

Tim Anderson whacks out the facts on the new Data Widgets — we're talking *wicked, man!*

## **Miscellaneous**

### **Internet 233**

Nigel Whitfield talks sense and censor-bility on the net, and helps you open those Perly gates.

### **Hardware 276**

Roger Gann turns to FAT32 and a heavy OS.

### **Networks 298**

Will Alpha meet its omega? Bob Walder gives his opinion. Plus, upgrading to two users.



#### **PCW/Hands On on CD-ROM**

Tip, trick, advice or review — if you saw it here first, you can find it again: there's a year's worth of *Hands On* columns on our monthly CD-ROM. For problem-solving or that elusive handy hint, the *PCW* cover CD has the answer.





# Wizard wheeze

In part three, Mark Whitehorn turns his attention to the Microsoft upsizing wizards and shows you how these can be used to smooth the path from Access to SQL Server.

**T**ime for a quick recap on my series dedicated to moving a database from a standalone Access application to an SQL Server database. Part I (*PCW*, April) looked at the basics of installing SQL Server and getting it up and running. Part II (May) looked at making an ODBC connection between a workstation and an SQL Server, and we mentioned the existence of the upsizing “wizards”, produced by Microsoft, to help smooth the path from Access to SQL Server. Part II also detailed the different components that make up an Access application and pointed out that all seven need to be considered when such an application is being updated.

I was going to look at both of these, but

the wizard seems to have taken up this month’s allocation of space. So, there’ll be more on the components next month.

## The upsizing wizard

There is some background information to be covered first — version numbers and alternatives, I’m afraid. There are many alternatives and you need to make sure you get the right one.

Access comes in four different flavours:

- The 16-bit version, Access 1.x and 2
- The 32-bit versions, Access 95 and 97

Conversion utilities exist within Access that will move your database applications up this scale: from 1.x to 2.0, from 2.0 to 95 and so on.

SQL Server comes in a variety of flavours (4.21, 6.0 and 6.5) for NT. Utilities are provided with SQL Server which will upgrade databases from 4.21 to 6.0, to 6.5.

My simple arithmetic suggests that there are 12 theoretical conversions: Access 1.0 to SQL Server 6.5, Access 95 to SQL Server 6.0, and so on.

In practice, Microsoft has provided four upsizing wizards:

**No.1.** Runs in Access 2.0 as an “add-in” and converts Access 2.0 databases to SQL Server 4.21.

**No.2.** Runs in Access 95 as an “add-in” and converts Access 95 databases to SQL Server 4.21, 6.0 or 6.5. The bad news is that this tool does not take advantage of any of the new SQL Server 6.0 or 6.5 features. Of the four, this is surely the least useful; its only unique feature is the 95-to-4.21 conversion, which must be a rare requirement.

**No.3.** Runs in Access 95 as an “add-in” and converts Access 95 databases to either SQL Server 6.0 or SQL Server 6.5.

Microsoft claims: “This tool does use the SQL Server 6.0 and 6.5 Identity datatypes and Declarative Referential Integrity (DRI). However, SQL Server 6.0 and 6.5 do not support cascading updates or deletes so if the Access database uses cascading updates or deletes, then the tool will offer the option of implementing these as triggers.”

**No.4.** Runs in Access 97 as an “add-in” and converts Access 97 databases to either SQL Server 6.0 or 6.5. Microsoft claims... (as before).

All of these tools work by exporting the Access tables to SQL Server and then linking the SQL Server tables back to Access as external tables. They also convert any table and column names that would be invalid in SQL (for example, those which contain spaces) into ones which are valid. They also generate any alias queries required in Access to map these new names. Finally, they convert indexes and default values as appropriate.

The upsizing wizards are available free from the Microsoft web site at [www.microsoft.com](http://www.microsoft.com) and on the Microsoft Access Upsizing CD. (Incidentally, this CD is a mine of useful information about upsizing and, if you are serious about upsizing, it is well worth badgering Microsoft for a copy.)

## Wizard workarounds

There are four upsizing tools but an important one seems to me to be missing. Many people are still using Access 2.0 and will want to upgrade to the most recent version of SQL Server which is 6.5; sadly, this option is not directly available. One workaround, but a tedious one since it involves installing an old version of SQL Server, is to upsize from Access 2.0 to

p230 >

SQL Server 4.21 and then convert the database you have just created from SQL Server 4.21 to SQL Server 6.5.

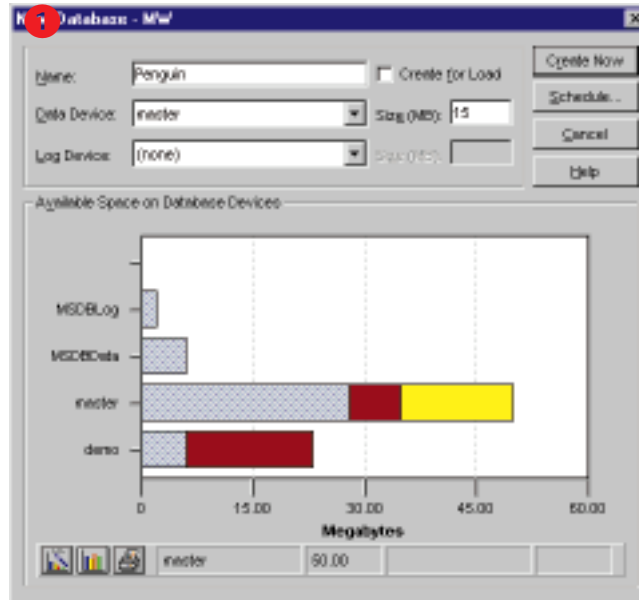
The other workaround is to convert from Access 2.0 to Access 95 or 97 and then use the appropriate upsizing wizard to convert to SQL Server 6.5. As a general rule this is a better option, although it does mean that you have to upgrade your workstations to Access 95/97.

#### If circumstances allow, try this...

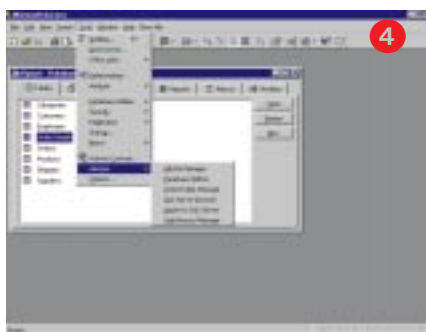
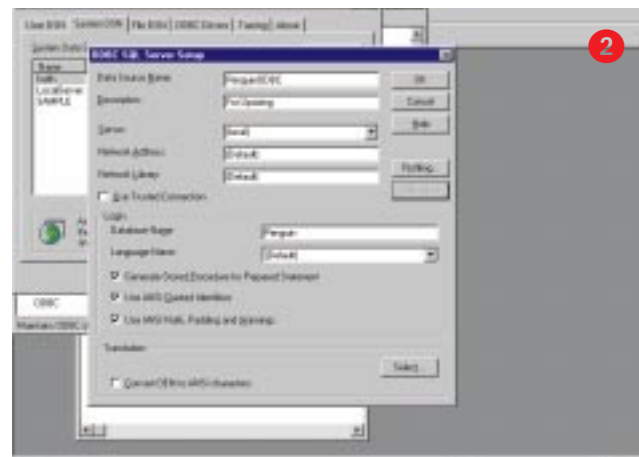
There is yet another ingenious possibility you may want to consider, depending on your circumstances. Suppose you have a clutter of legacy Windows 3.1 workstations. You may need to go on running Access 2.0 on those and yet want to run SQL Server 6.5.

The good news is that you can do this without having to go through SQL Server 4.21. Do the conversion of the Access database from Access 2.0 to 95/97 on a single stand-alone machine. Then use the appropriate upsizing wizard to convert that to SQL Server 6.5.

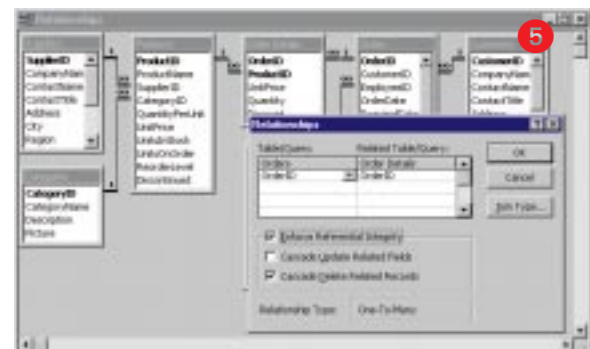
The SQL Server tables created by the upsizing wizard can then be manually linked back to the original Access 2.0 application which is still on all the remaining workstations. It's a little long-winded, but I suspect it's a path that will interest many people who are having to upsize on a budget.



(1) Two new add-ins should appear after the upsizing wizard has been run, SQL Server Browser and Upsize to SQL Server



- (3) Creating a 15Mb database in SQL Server called Penguin  
 (4) Creating an ODBC connection to Penguin  
 (5) The general relationships between the tables and specifically those between Orders and Order Details



#### Move on up

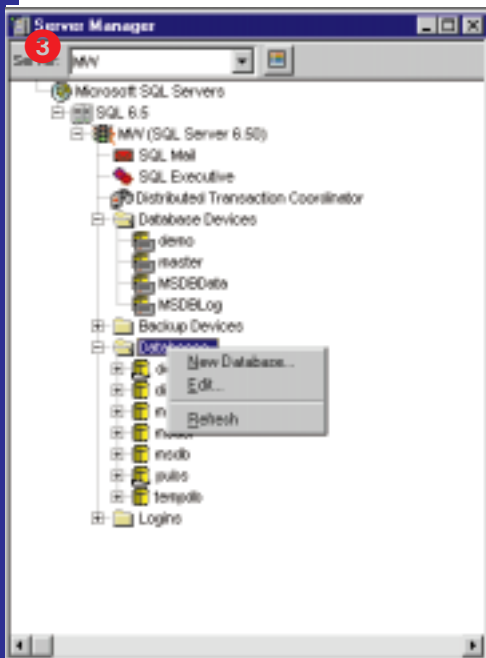
Of the four upsizing wizards, I have elected to demonstrate the Access 97 to SQL Server 6.5 one, secure in the knowledge that whichever I choose will be wrong for most people (sorry if it isn't the one you had in mind).

This upsizing wizard is on our CD-ROM (the others, as previously stated, are available from the Microsoft web site and on the upsizing CD-ROM). In addition, on the PCW CD-ROM you will find a test Access 97 database called UPSIZE.MDB. This is a cut-down version of the Northwind database and was supplied by Microsoft for demonstration purposes. In fact Microsoft, in the shape of the ever-helpful Keith Burns,

kindly supplied much of the information given in this series. We might argue about commercial motives, but Microsoft is keen to make upsizing as easy as possible.

UPSIZING.MDB contains all the tables from the Northwind database (with some of the fields renamed). Two simple forms have been defined: Orders, and Order Details.

You need five items installed before proceeding (I'll assume you already have the first two installed):



(2) Creating a new, empty database in SQL Server

1. Access
2. SQL Server
3. A target database in SQL Server that will hold the new tables. The database can be created using the SQL Enterprise Manager: right-click on "Databases" and

select New Databases. Then create one that will comfortably hold the data about to be upsized from Access.

4. An ODBC connection to that database

— we covered how to create an ODBC connection earlier (PCW, May). The only thing you need to ensure is that this one connects to your new SQL Server database (Fig 1).

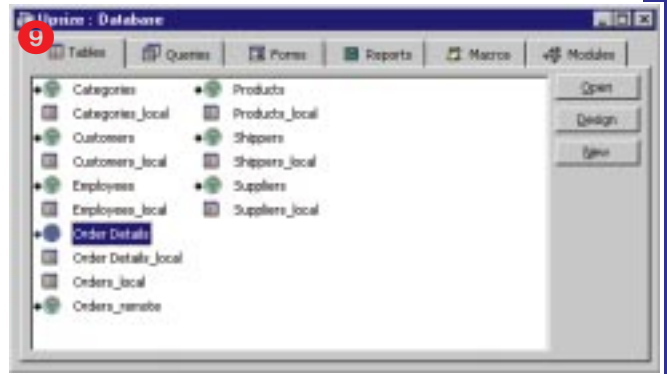
5. The Access Upsizing Wizard. The 97-to-6.0/6.5 upsizing wizard exists as a file called ACCESS97 UPSIZING TOOLKIT.EXE.

Run that, and follow the instructions. It will install the necessary bits, which take up just under 6Mb of disk space. Once the install is complete, nothing will seem to have changed until you examine your copy of Access 97. So, fire it up, open a database — at this stage, it doesn't matter which one —

pop-down the Tools menu and have a look under Add-Ins (Fig 2). By this stage you will have both Access and SQL Server running. You have an empty database in SQL Server set up and waiting for the incoming data and you have an ODBC connection to this new database.

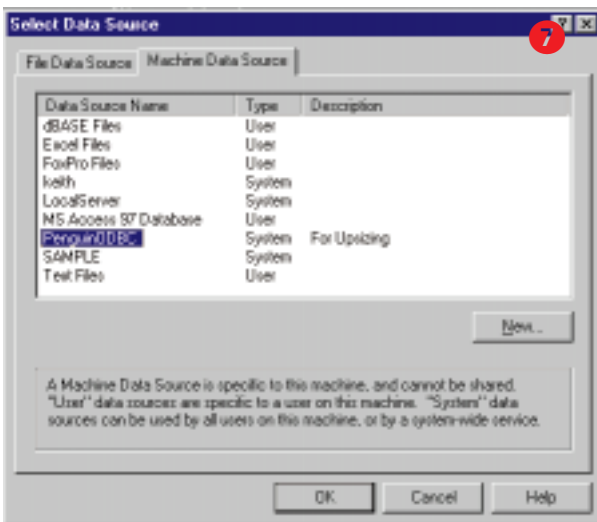
**OK, let's upsize!**

1. Load into Access the database you want to upsize (I'll be using Keith's

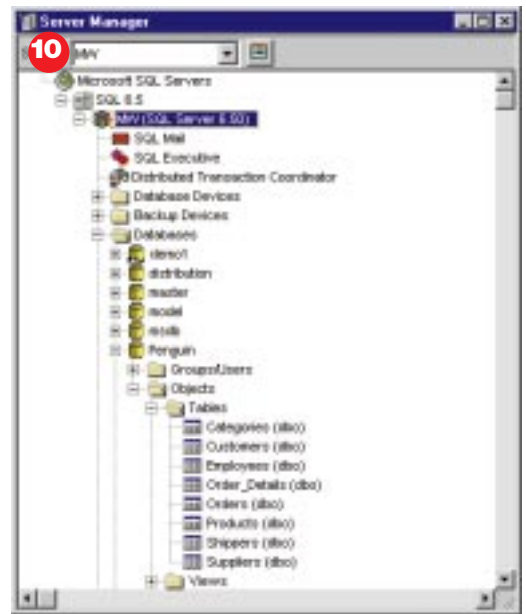


(9) The Access database after upsizing. The local tables have all acquired a “\_local” extension and the tables on the SQL Server have a cute “globe” icon

UPSIZING.MDB. If you want to use it too, copy it from our PCW CD-ROM to your hard disk and remove the Read-only property. If you are using UPSIZING.MDB, it is worth noting the following:



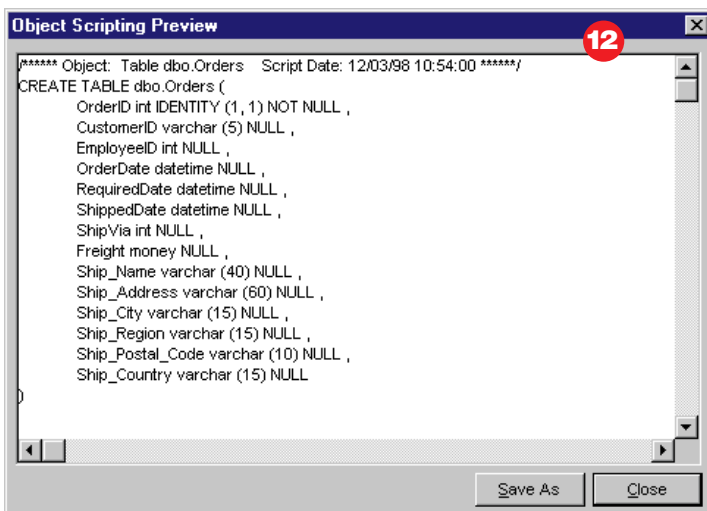
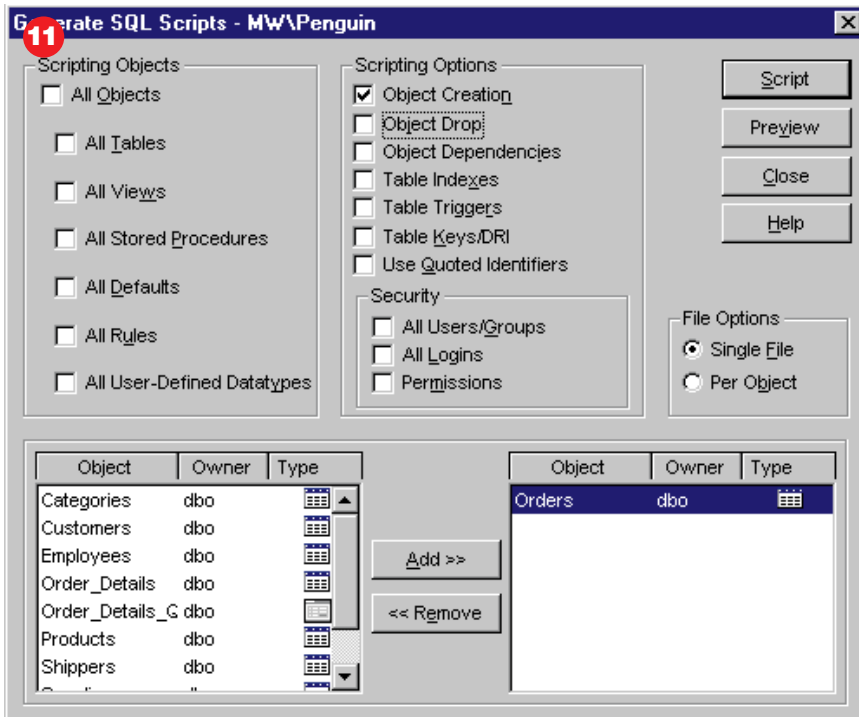
- (6) Using the Upsize Wizard
- (7) Choosing the correct ODBC
- (8) Choosing the table attributes to export from Access to SQL Server



(10) The tables have appeared in SQL Server

- The Order Details table has spaces in its name (SQL Server is typical in not allowing table names with spaces).
- Within the Orders table, many of the fields have spaces in their names (i.e. those starting with “ship”).
- Orders.OrderID is an autonumber field.
- Order Details.UnitPrice, Order Details.Quantity and Order Details.Discount all have data validation. Any Access form based on these fields will pick this up. You can illustrate this by running the Orders form and attempting to enter an invalid entry in any of these fields (marked in blue text).
- The indexes on the Orders table.
- The relationships between the tables (from





(11) Examining the scripts associated with the table Orders  
(12) The Create script for Orders

the Tools menu). Click on the link between Orders and Order Details, and you can see that some relationships not only enforce integrity, but also cascade deleted records (Fig 3). The application will depend upon these integrity rules and so they must be preserved.

- The number of records in the Orders table is 830, each of which has a few detail records.

2. Now fire up the Upsize to SQL Server Add-In. It will ask if you want to use an existing SQL Server database or create a new one. You have already created a target one, so choose Use Existing Database.

3. Next, choose the ODBC connection. Thereafter, the wizard is pretty self-explanatory. You choose the tables to export, the table attributes (Fig 4) and finally you are asked if you want a report. The

default is "No", but I would recommend asking for one.

4. Sit back and wait for a few minutes and you should be presented with a report (which you can print and file as part of the documentation of the database) and a collection of tables (Fig 5).

#### What has the wizard done?

The wizard has done most of the "grunt" work: that is, it has created SQL Server tables, made a good guess at the appropriate data types and moved the data. The wizard also has a go at dealing with the other problems associated with upsizing. For example, it will have transferred the primary key definitions and substituted \_ for the space character in the field names.

However, the wizard is not perfect and it falls to you to check your database to see

what tweaking needs to be done by hand.

If you used UPSIZE.MDB, the following steps are worth taking to see what the upsizing wizard has done:

1. Go to SQL Enterprise Manager and convince yourself that all the tables exist and that Order Details has become Order\_Details. (Hint: if the tables don't appear, try stopping and restarting SQL Server. The refresh isn't always what it might be.)

2. SQL Server does most jobs using the language, SQL. It used that language to create the tables etc. that you now see in the target database. One way of seeing what the upsizing wizard has done is to look at the SQL it used. You can do this as follows:

(i) In Server Manager, right-click on a table (say, Orders) and select Generate SQL scripts. Choose the scripting option you want to examine (say, Object Creation) and click on Preview (Fig 6) to see the SQL used to create the table (Fig 7).

(ii) Preview the SQL script for the orders table — allowing triggers, indexes, DRI (Declarative Referential Integrity) and so on — and convince yourself that, for the Orders table:

- All the fields allow nulls — which might not be correct!
- All the fields starting with ship now are named ship\_ without a space.
- Eight indexes have been created.
- Triggers have been defined to enforce RI.

3. The Orders\_remote table is an ODBC table like the others, but there is now an Orders query which aliases the ship fields from fieldnames with underscores to those with spaces. The form opens the query that points to the Orders\_remote table.

4. Run the Orders form as before. Verify that the records are now available and updatable in SQL Server. Try "breaking" one of the constraints to see the changed behaviour. To continue with the previous behaviour you will need to add validation to the form. Happily, Keith Burns has provided that for us in the shape of the form called Orders (Including Validation).

#### PCW Contact

PCW address (p10) or email him at [database@pcw.vnu.co.uk](mailto:database@pcw.vnu.co.uk)

■ Mark Whitehorn's book, *Inside Relational Databases*, is available via our Reader Offers. See page 310 for details.



# Coming to your **censors**

Nigel Whitfield looks at the case of censorship on the net, and the Perl-y gates are open wide and leading to advice on how to put a database on the web. Plus, your questions answered.

**C**ast your mind back about two years. The Clubs and Vice unit of the Metropolitan Police produced a list of internet newsgroups that they claimed were responsible for child pornography, and "requested" that service providers remove them from their servers. Some complied, while others did not. Although it may be old news by the time you read this column, you'll have heard that the Metropolitan Police are back on the warpath, threatening action against companies like Demon Internet for failing to remove the "suspect" newsgroups.

Removing newsgroups is a destructive tactic and, like the bizarre bans on foreign satellite channels that are deemed too spicy for us to view, suggests a rather blinkered view of technology.

## Call the Internet Watch Foundation if you're concerned about illegal material on the net

It's also one that ignores the reality of what's been happening. The Internet Watch Foundation [www.internetwatch.org.uk](http://www.internetwatch.org.uk) has been responsible for removing over 2,000 illegal items from the internet in the last year; at least one customer of a British ISP is serving time in prison as a result. Technology developed by the IWF is making it easier for ISPs to delete illegal material from their servers. A good start in the fight against child pornography, you might think.



But still the police would rather see newsgroups deleted.

Censorship, when it happens, is seldom well targeted and the original proposals

p234 >

from the Metropolitan Police were no exception; along with groups clearly used for child pornography were others covering a wide range of subjects, including plenty of consensual, legal, adult material. While some of it may not be to everyone's taste, taste isn't the point. Child abuse is.

No-one condones the abuse of children, and the distribution of material resulting

from it on the internet. But there are better ways to fight it than by burying our heads in the sand and pretending that deleting some newsgroups will make it go away. Rating, reporting and tracing material is a more viable solution than wholesale vandalism, whether it be of books or net newsgroups which, in any case, could only be removed from some servers, not all.

## How to put a database on the web with Perl

If you have lots of information in a database and want to publish it on the web, you have a number of different solutions. It's now simpler than it has been for a long time, since you can buy off-the-shelf databases that include web connectivity, or a server that is designed to link easily with your existing database.

All those solutions, however, pre-suppose that your web site and the database are running on the same machine, or at the very least can talk to each other in real-time over a network or the internet. As yet, there aren't many internet providers that will host such solutions for you, and they'll cost a fair bit when you do find them.

There is a solution that, while not perfect, will do the trick for a few of the common database publishing problems: all you need is a web server that allows you to run a Perl script, and a file exported from your database. The trick is to decide which data you need available on the web server, and export it as a CSV file (comma separated values). Pretty much every database (and many spreadsheet programs) can produce this type of file; if you're not familiar with it, it looks something like this:

```
'Nigel Whitfield', 'nigel@diversity
.org.uk', 'male', '18/11/1967',
'London', 'Journalist'
```

In many programming languages, turning a line like that into a set of variables could be a tedious task, but in Perl it can be surprisingly easy. One of the ways an array can be written is as a series of values, separated by commas, like this:

```
@info = ( 'Nigel Whitfield',
'nigel@diversity.org.uk', 'male' );
```

Looks familiar? The first element of the array, \$info[0], would be 'Nigel Whitfield' in the example. You can also use similar notation to split an array up into parts, using a statement like the one below, which would set \$name to 'Nigel Whitfield'.

```
( $name, $email, $sex ) = @info ;
```

If you combine this with one of Perl's other powerful statements, the 'eval' command, you can process a whole line from your CSV file, splitting it up into different fields with each field assigned to a variable. You'll also need to do a little more work, since if your CSV file has double quotes around each field, Perl will try to interpret special characters such as \$ or @.

Here's the code that will read a file, called

database.csv, looking for a match in the first field, and then doing something — perhaps formatting a web page with the result — when it finds the match. If you combine this code with a form that asks people what they're looking for, you can see how easily relevant data could be pulled from a database and used to create a web page on the fly, using our earlier example line from a CSV file.

```
1. open( DB, 'database.csv' ) ||
&error_msg('Sorry - the database could not
be opened' );
```

The || symbol tells Perl to process the statement following it, only if the one before it, in this case the Open File command, succeeds.

```
2. while(<DB>){
```

The while statement, in this form, makes the script read one line at a time from the file that we're referring to as DB. Each successive line will be read in, and stored in \$\_.

```
3. $_ =~ s/"/\\"/g ;
```

```
$_ =~ s/\'/\'/g ;
```

These two lines are needed if your CSV file has double quotes round each item; they're both search and replace commands. The first changes any apostrophes to \', which prevents them having any special meaning to Perl (but they'll still print out properly), while the second changes all the double quotes to single ones. The g on the end of each command makes it a global replace, acting on all occurrences in each line.

```
4. ( $name, $email, $sex, $dob, $location,
$profession ) = eval( '$_' );
```

This is where the real work is done, splitting the line into a series of variables. The '\$\_' is simply joining strings together, so that what's inside the eval statement looks exactly like the way an array can be written in Perl.

```
5. ( $name =~ /$search_key/i ) &&
&display_record ;
```

```
}
close DB ;
```

Finally, we check to see if the search key is similar to the name. Using a regular expression allows people to search for substrings, or patterns, and the i on the end of the match statement makes it case insensitive. The && means that the display\_record subroutine is only called if the match is successful.

The script relies on a few extra things you'll need to add yourself; firstly, two subroutines — error\_msg, which should create an HTML message telling the browser



## How to put a database on the web with Perl (cont'd)

that there's been an error, and `display_record`, which will take the variables you've just extracted from the CSV file and format them to appear on the page.

You'll also need to add code to the program to output the start of the web page, complete with Content-Type headers, just like any other CGI program, and to process whatever input is supplied by the person reading the page. In the short example we've given, the variable `$search_key` holds what people are looking for and could be either an exact match or a partial one. For example,

entering 'nigel' would match our sample record 'Nigel Whitfield.'

If you have a large database and want to do lots of searching on it, remember that you could always read it in and use Perl's associative arrays so that you can go directly to an item by name when you need it.

For more information on Perl, look at [www.perl.com](http://www.perl.com), or invest in the *Learning Perl* and *Programming Perl* books from O'Reilly. If you want a low-cost way to get information from a database onto the internet, it could be the solution you're looking for.

## Questions & Answers

**Q** Could you help me with a problem with Internet News that Windows 95 OSR2 installs? There are many newsgroups that I like to read, but I do not have enough time at work to read them. I want to take them home to a non-internet enabled machine to read offline. Is this possible with Internet News, and if so, how do I do it?

**A** It's hard to do this with Internet News, as it's not really designed for accessing newsgroups offline. You'll be better off using a news program specifically designed for that purpose, such as Forte's Agent (or the free version, Free Agent). Check the Forte web site at [www.forte.com](http://www.forte.com) for more information. You might also like to consider Turnpike, which has lots of features for reading news and mail offline; the latest version co-exists happily with Windows 95 Dial-Up Networking, making it easier to install.

Remember that it's almost certainly worth investing the time in learning how to use a powerful newsreader. By taking advantage of kill and marking features, you can quickly see which articles are worth looking at and can delete all those you don't want to see. For many, most of the time they spend reading news is spent not on reading articles, but on choosing them. A good newsreader will cut much of that out.

**Q** I am designing a complicated web site using Notepad only. It involves the listing of about a hundred different items which the user can click on, and buy (if they want).

On the left-hand frame I have listed all the items in alphabetical order. What I want to happen, is for the user to click

on an item and for another page to come up in the main frame, which contains the text of the clicked link. You can see why I want to do this: otherwise I will have to do a separate web page for each item, just to include its name in a couple of places.

**A** It sounds like what you want to do is a very simple substitution for a key word or phrase in a single page, which means that a script is called for, though not a complicated one by any means. You need to make the links in the left-hand frame target the right-hand one in the usual way, but instead of calling up a page, they should call a script. If you use syntax like this in your link:

```
<a href='http://www.myserver.com/insert.cgi/widget'>
```

where you've called your script `insert.cgi` and the item the user clicked on was 'widget', then the web server will set the `PATH_INFO` variable to `/widget` so you can access it easily in your script. It's then a question of making a script search for a particular string in a web-page file. Pick something that's unique, like `#INSERT_HERE#`, and swap it for the contents of `PATH_INFO` before printing the whole page out, so that it goes back to the browser with the amended page.

If you want a more complicated page, with more than one substitution, then you'll need a more sophisticated script. Instead of using `PATH_INFO` you'll have to create a property query string (which will be passed to your script as the `QUERY_STRING` variable), a little like this:

```
<a href='http://www.myserver.com/insert.cgi?name=widget&colour=red
```

The script itself? Consider that your

## Questions & Answers

(continued from p237)

homework. If you have access to a web server with Perl, you'll find all the appropriate bits of code in this column, in the last few issues of *PCW*.

**Q** What is legal and illegal as far as email is concerned? Common sense tells me that

I have a right to send email to someone, as long as they have not told me not to. I also obviously treat an email like a letter. But my confusion is this:

1. Is it OK to send a letter to many people: e.g. 20, 40, 100 people?
2. Is it OK to forward advertisements, and other letters which ask you to "forward to your friends"?
3. I have a web site and want to send newsletters to people. I clearly write the words "newsletter" in the subject field so that everyone knows it is a newsletter, and clearly explain that a recipient can unsubscribe by sending me an email with the words "Remove" in the subject field. Is this illegal?
4. Do I have a right to filter addresses from letters I receive, e.g. chain letters, and send my newsletter to them?
5. How dangerous is email? I know it is impossible to get a virus through email, but what are the dangers of email?
6. Do the rules for email vary a lot from country to state to ISP? I use AOL.
7. Is there a web site which contains rules for sending email, as in what is illegal and not?

**A** There are no hard and fast rules for email, but in general, mass unsolicited email is frowned upon, and many providers will terminate your account if you use it to send them.

In principle, sending a mass email to lots of people is perfectly acceptable, provided they are expecting it. If it's unsolicited, then they have every right to complain, and you shouldn't send people large mailings. Nor should you pass on messages that ask to be passed on: they're almost always junk mail, stories about children dying of cancer that are years old, or revelations about the latest improbable virus. And I've yet to see one that was worth the effort of



AOL users can check what's permissible at keyword COSUK [see main text, below]

forwarding. Sending this type of material to an email list is a great way to be removed from it.

If you do want to send mailshots, you shouldn't just cull email addresses from things that are sent to you. Always ask people before you put them on a list — a short informational message saying: "If you want to receive my newsletter, please respond with the word 'Subscribe'" is far more polite than sending people lots of stuff that they have to pay to download, and asking them to unsubscribe. Mass unsolicited email is rude and costly to the recipients, and if I were your ISP, I'd close your account after the second complaint.

As for viruses, it is possible to receive viruses as an attachment to email; the text of the message itself cannot be a virus (despite messages warning you about GOOD TIME or JOIN THE CREW emails).

Don't accept (or send) executable files via email. Don't set your mail program up to open attachments automatically. If you really must send word processor or spreadsheet files, use basic formats like RTF and SYLK which don't have macro languages that could harbour a virus, and have the added advantage of being readable by far more people than proprietary word processor formats such as Word and WordPerfect. (Those PR people who read this column and then send me press releases in Word format, will be delighted to know that for security I delete them all without reading them.)

### PCW Contact

**Nigel Whitfield** is a freelance journalist, maintainer of several internet mailing lists and consultant to a number of non-profit organisations. Write to him via the *PCW* address (p10) or contact him at [internet@pcw.co.uk](mailto:internet@pcw.co.uk)



# Unstable load

Windows not loading properly? Many of us create a boot log file for troubleshooting: it's a good idea, but the messages can be confusing. Tim Nott translates nerdish into English.

**W**hen troubleshooting Windows problems, it is often useful to create a boot log file by choosing the option from the F8 boot menu. It can also be confusing. I've had several readers mail me along the lines of "I've found the problem; something called ndis2sup is failing to load. So what do I do now?"

Well, the bad news is that they haven't found the problem. The good news is that the failure to load isn't usually a problem; it's just that whoever programmed these messages enjoyed using macho-nerd language calculated to inflict fear, uncertainty and doubt upon the user.

Here are some of the more common failures (this list is by no means exhaustive):

- NDIS2SUP.VXD will fail if Windows doesn't find any NDIS-2 network drivers in need of support.
- Another popular failure is EBIOS. If you don't have an extended BIOS, then Windows, unsurprisingly, will fail to find it.
- If you don't have advanced power management (APM) or have turned it off from Device Manager, VPOWERD will fail.
- If you don't have any DirectX-enabled games on your PC, the DirectSound library will be unable to introduce itself to your sound driver and DSOUND will fail to load.
- If you have a notebook that is sometimes connected to a network or docking station, then VSERVER.VXD may not load.
- Another popular failure is VSHARE, which loads successfully early in the boot process then, for reasons best left unpondered, tries in vain to load again, later on.
- There's something called SDVXD which appears to be doing quite well in the early stages, with a SYSCRITINITSUCCESS and a DEVICEINITSUCCESS, only to fall at the last fence with an INITCOMPLETEFAILED.

```

[0007493] LoadSuccess = VTDAP1
[0007494] Loading Vxd = PERF
[0007495] LoadSuccess = PERF
[0007496] Loading Vxd = asd.vxd
[000749E] LoadSuccess = ncd.vxd
[000749E] Loading Vxd = vmdir.vxd
[00074A2] LoadSuccess = vmdir.vxd
[00074A2] Loading Vxd = adis.vxd
[00074A7] LoadSuccess = ndis.vxd
[00074A7] Loading Vxd = adis2sup.vxd
[00074A7] LoadFailed = ndis2sup.vxd
[00074AA] Loading Vxd = vnetbios.vxd
[00074AC] LoadSuccess = vnetbios.vxd
[00074AD] Loading Vxd = mtr
[00074AD] LoadSuccess = mtr
[00074B0] Loading Vxd = adiswan.vxd
[00074B2] LoadSuccess = adiswan.vxd
[00074B2] Loading Vxd = JAVASUP.VXD
[00074B4] LoadSuccess = JAVASUP.VXD
[00074B5] Loading Vxd = NTKERN
[00074B6] LoadSuccess = NTKERN
[00074B6] Loading Vxd = UDF
[00074B6] LoadSuccess = UDF
[00074B9] Loading Vxd = dfs.vxd
  
```

## Making a success of failure

This, again, is by design. It's a temporary disk cache that is loaded to speed up the boot process. The last statement indicates that it is no longer needed and so has been removed from memory.

- You might get entries stating that a font has failed to load. This usually only happens to a new installation where one or more font files are not physically located in the fonts folder. It's not a worry; the fonts will actually display and print correctly. Sometimes a load will fail because a driver has been replaced by a more recent version, which subsequently loads successfully.

## Tipping the wink

Good news for Mike Box (and fellow sufferers) who last month complained that there appears to be no way of disabling the Windows key in DOS games, with the result that if this key is pressed accidentally, the Start menu appears and the game can crash. I've just rediscovered a utility that

has, in fact, been around since 1996. It's part of the Microsoft Kernel Toys, it's called Doswinky (cute, or what?) and, would you believe, it disables the Windows key during DOS sessions.

I've included the entire Kernel Toys on this month's cover-mounted CD-ROM. For those who haven't seen these before, they are a rather less glamorous counterpart to the Powertoys, produced by the kernel team (rather than the shell team, who produced Powertoys). The EXE file is self-extracting; copy it to a temporary folder and run it. See the readme file for information on all the toys or, if you're in a hurry, right-click and Open the DOSWINKY.INF file, which has instructions on how to install and use it.

## Password blues

It's a common complaint. When you start a Dial-Up Networking connection, there's a handy check box for it to "remember my password". This saves untold hassle if you can't remember, or don't want to type in, a password every time and security is not an issue. But there's one teeny-weeny snag. The box is greyed out. Ho-hum!

What you need to do is first go to Control Panel, Networks (even if you're not connected to a network, bear with me). Make sure "Client for Microsoft Networks" is installed. If not, add it (you may need to dig out the Windows CD-ROM). Select "Windows Logon" from the Primary Network Logon drop-down list. Close this dialog, then go to Control Panel, Passwords and select the User Profiles tab. Check the "Users can customize..." option, then OK out. Restart the PC and you'll be asked for a password. Now, if you don't need or do not want to supply this every time, leave the box blank and click OK and you won't see



## Who's for afters?

A rather interesting little utility called After, from Cool Tools, has been brought to my attention by Nigel Oulton. It delays the loading of programs. Now, you may think that there's quite enough delay in loading applications already, but I quote from the Readme: "If you have a lot of programs in the Startup group, making your boot-up very time-consuming, you can replace the program names with an AFTER command. In this way, you could (for example) load your mail program ten seconds after starting up, your ICQ program after 15 seconds, your Office Fast-find program after 20 seconds, and so on. If you're in a hurry and don't want to load one of them, just right-click the icon and select 'Cancel', and the program won't be loaded at all. If, on the other hand, you want to load one of them immediately, right-click the icon and select 'Run Now', or double-click the icon."

● I've stuck it on this month's cover-mounted CD. Let me know what you think.

this dialog again unless you exit and "Log on as a different user". Windows will create a .PWL file to contain all your passwords in encrypted form, including the DUN connection ones, and you should find the "Save password..." check box is no longer greyed out.

Another problem you might have is that Windows suddenly develops password amnesia after upgrading with Service Release 1 update. There's a fix for this which you should find at the same location you obtained the Service Update — the filename is MSPWLUPD2.EXE. Note that you should move or rename any existing .PWL files before installing the update.

### Department of obscure tips

1. We've had a lot of correspondence on the subject of file associations being "poached" by wayward applications. The classic case is where you have been using Paint Shop Pro and install a heavyweight image processor. Suddenly, you find that when you double-click on a TIF file, say, instead of the file appearing in Paint Shop in a second or two, the heavyweight application has now assumed the association and arises from its slumbers with a dignified 30-second load time.

When someone told me that holding down the Shift key as you start Paint Shop will restore the associations, I was sceptical. But having discovered something had taken over the TIF extension, I gave it a try: and it worked for me *and* the reader who had just screwed up his JPG extension.

2. This tip came from both Alex Helfet and

Edward Bownass. If you've got disk space to spare and can't be bothered to run and find the Win95 CD each time you want to add a component or generally fiddle about, copy the entire Win95 folder from the CD to a suitable location on your hard disk, say C:\CABS. Back up the registry, start Regedit and go to:

```
HKEY_LOCAL_MACHINE\SOFTWARE\
Microsoft\Windows\CurrentVersion\
Setup
```

Change the value of "sourcepath" to the path wherein you've copied the files (e.g. C:\CABS\Win95). Close Regedit, and you'll find Windows should have all it needs on the hard disk next time you Add/Remove components. You do lose disk space, though: my original, July '95 CD-ROM has 32.2Mb in this folder, but Edward reports that OSR2 needs 79Mb.

## A fine alphabetic effort



Following March's attack on the quick brown fox, Kevin Weedon has outdone "Jackdaws love my big sphinx of quartz" with "Quick-blowing zephyrs vex daft Jim" (illustrated above). Only the "E" and "I" repeat. Not bad, eh?

● Can anyone achieve the ultimate, a 26-letter sentence with no repetition, but which still makes sense?

## Questions &amp; Answers

**Q** When I boot my machine, the task bar only shows “Start” and “1-Step Backup” (the latter is the tape backup software). If I now minimise any running program, it does not appear as an icon on the task bar but just vanishes as if it had been closed. Some of them, such as “Visio”, winge if I try to reopen them, with “Cannot have more than one open”.

David Righton

**A** Some badly behaved programs not only do not display a button on the Taskbar, but prevent other applications from doing so. Alt + Tab (or Control + Alt + Del) will show you what is really running. *(It later transpired that David's problem was with his version of TextBridge. When he obtained an upgrade, all was better.)*

**Q** When I grab a scrollbar button at the side of a window, I can drag it up and down to change the view. But if I stray too far to the left or right of the scrollbar, it jumps back to its original position. It's irritating because I've developed a mousing style where I rely on being able to wander as far left or right as I like while dragging a scrollbar. I know of no other OS (other than NT) which behaves in such an infernal manner. I've trawled the registry in vain for a suitable threshold value to edit but so far I've had no joy.

Ant Skelton

**A** Sorry, you are stuck with it, but if you look carefully you will see that you do get *some* latitude: about twice the scrollbar width each side. Note that if you move back without taking your finger off the mouse button, the scroll position will jump back to where it was when you left.

**Q** WordPerfect 7 seized up on me, and when rebooting I ran Scandisk to clear up the bits and pieces left lying about. For the first time ever, I got an error message about

MS-DOS filenames [Fig 1]. Out of interest, I generated a folder with a length of more than 66 characters and ran Scandisk, but it didn't pick up my new folder as having an incorrect filename.

Chris Booth

**A** You'll find that this situation often occurs when you have User Profiles enabled, but in this case it looks as if it was MS Flight Simulator. As your screenshot suggests, it's a limitation of DOS rather than Windows and can safely be ignored. However, you may have problems when compressing, uncompressing or upgrading with DriveSpace. In this case you need to make a note of the path, press the ignore button, then move the offending folder(s) to a shorter path before running DriveSpace. After compressing, you can move them back to their original “long,” locations.

**Q** Could you tell me how to get rid of the startup logos for certain programs on my computer?

I find them annoying because all they seem to do is advertise the product that I've installed on my computer and slow down the startup process. I've looked in the system and win.ini files for information. I've also looked in a folder called Startup, for information on where



**Fig 2** While you wait: splash screens do serve a purpose

to find what I am looking for. I've also looked in my config.sys and autoexec.bat files, but without success. Can you help me?

Lloyd Blake

**A** Relax, Lloyd. Although some applications have an option not to show the “Splash” screen when loading, it is not something you can turn off on a global level.

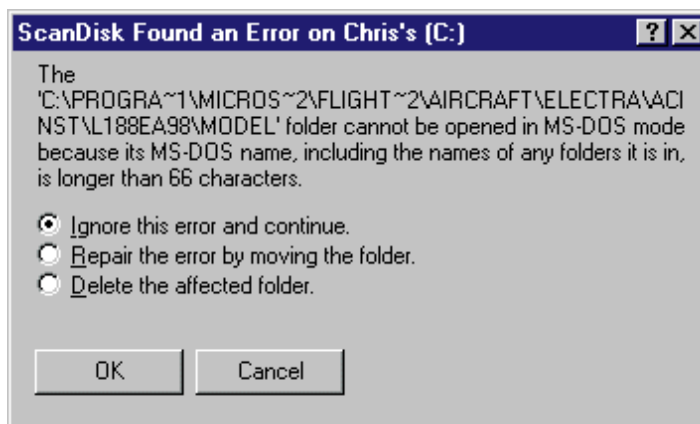
These do not slow down loading of the program — the idea is to reassure the user that something is actually happening as the application uncoils itself from the hard disk (Fig 2). Otherwise, the user might think they had not clicked properly and try again. And if there is one thing worse than waiting for a slow application to load, it's waiting twice.

**Q** I am unable to finish a disk defragmentation run as the program insists that the drive's contents have changed, and it restarts.

Even if I close down all my applications and utilities like Cleansweep, I am still unable to complete the defrag on my 2Gb C: partition. The D: partition has very little data stored on it so the defrag finishes.

Dick Davies

**A** I'll bet you a chocolate digestive biscuit that you've got FindFast running (it does not appear on the Taskbar). Press Control + Alt + Del to see what is running. You can disable FindFast by removing its shortcut from the StartUp menu. You really will not be missing much and your PC will perform faster.



**Fig 1** Chris Booth's mysterious error message

**PCW** Contact

Email Tim Nott at [win95@pcw.co.uk](mailto:win95@pcw.co.uk) or write to him c/o the usual PCW postal address (p10).



# True colours

Panicos Georghiades and Gabriel Jacobs show you how to tackle problems with monitor and graphics card settings, and alter or restore the colour of hypertext using the WIN.INI file.

**T**his month, two items of correspondence give us the chance to delve into numerous topics associated with colours.

One of these is related to Windows Help and defining colour settings, the other to screen resolutions, colour depths, video memory and monitor sync frequencies.

Dick Davis <rjdavies@nildram.co.uk> wants to know if we can point him towards the area of Windows 3.1 and 3.11 where he can make a change to restore the standard green colour to the link topics in a Windows Help file.

He writes: "Following the installation of some software (I know not what), the active links are shown in black (the underline is still there, thank goodness). Some time ago I did find a reference to an .INI file and command that was supposed to control the colour, but it certainly did not work for me. Can you help?"

We replied that the only program which has been documented as having caused problems affecting the green colour of hypertext context jumps and glossary entries, is software related to the Wacom graphics tablet.

Anyway, for you and any other readers who may wish to restore or alter the green colour to some other one, there are two entries you can add to the WIN.INI file which can do this. Use Notepad to edit the WIN.INI file (better not to use a word processor).

1. Move down the file and find the [Windows Help] section.
2. Add the following two lines:

```
JumpColor = 0 0 255
PopUpColor = 0 0 255
```

These change the hypertext keywords to blue. The three numbers to the right of the

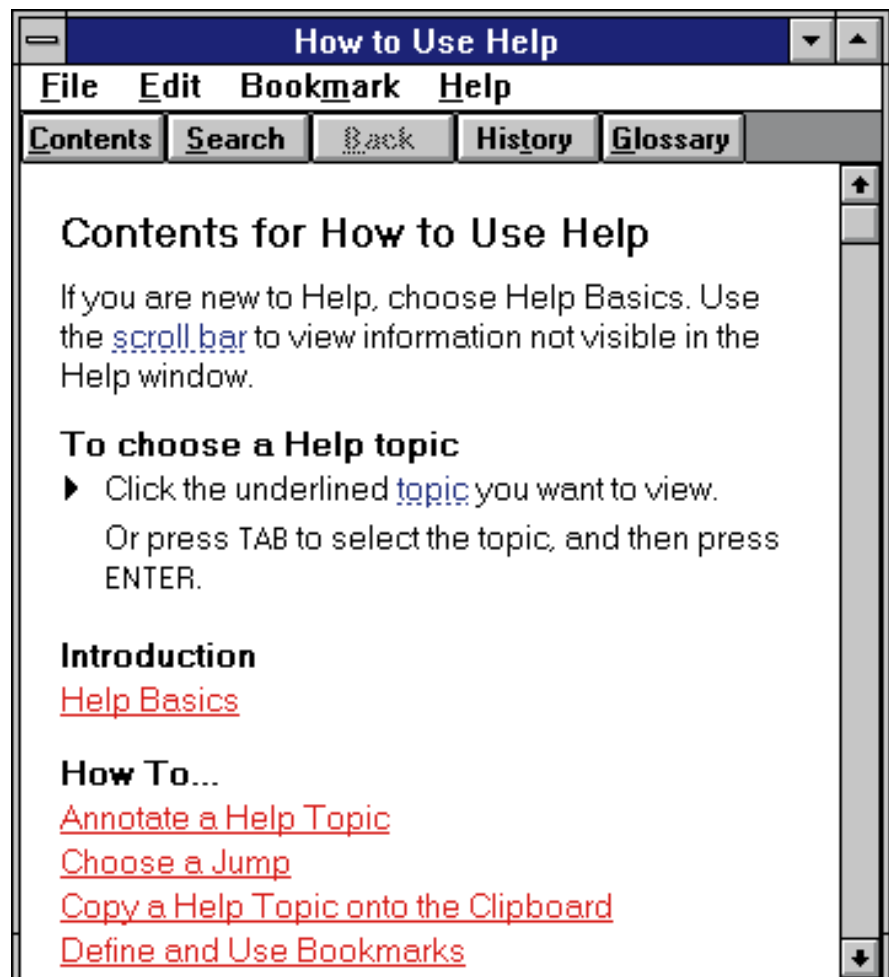
equal (=) sign represent the red, green and blue (RGB) colour values which make up the colour — they range from 0 to 255. See next heading, "RGB Colour Settings".

• **Note:** We found that these settings are not compatible with some graphics cards when set to high or true colour modes, and the resulting colour you get is black.

## The values of colour: RGB (red, green, blue) colour settings

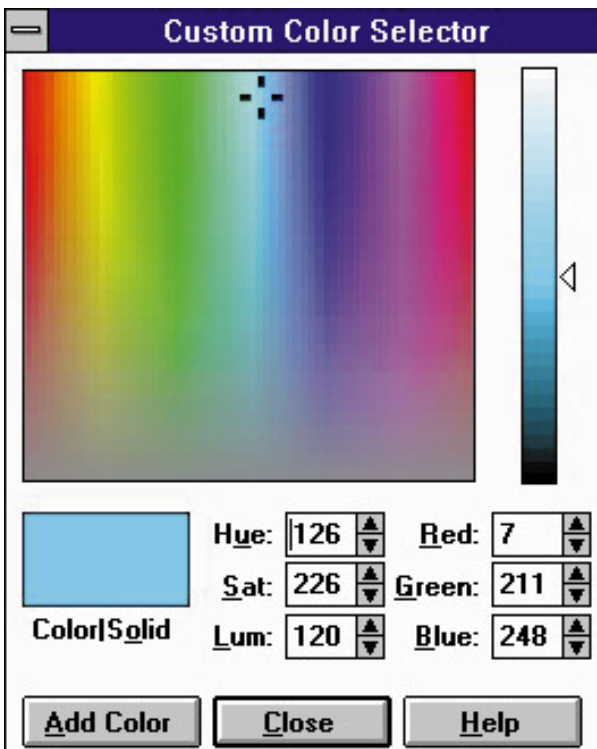
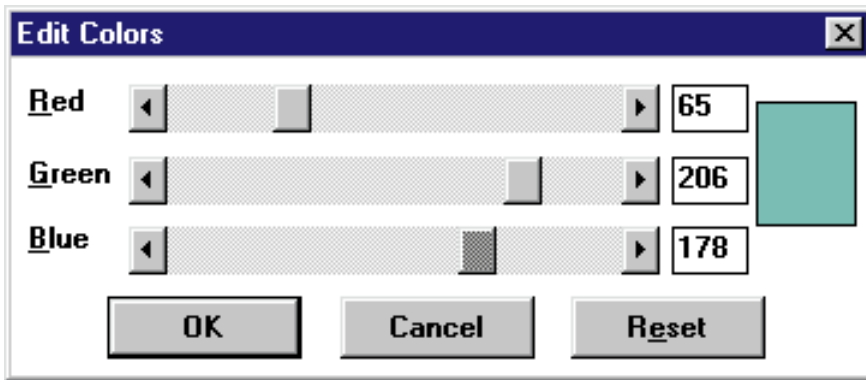
Many Windows programs use the three RGB (red, green and blue) colour values to define a colour.

These values range from 0 to 255 and work using the additive colour theory — mixing colour as light, as opposed to the



Change the colours of the hypertext links in help files by adding two lines of code to the Win.ini file





To find the RGB values of colours, use either the Windows Paintbrush Accessory (above) or the Control Panel's Colour icon — Define Custom Colour settings (left)

#### Colourful memories

Rick Scannel  
[<rick@hindmans.demon.co.uk>](mailto:rick@hindmans.demon.co.uk) has had awful problems with his new monitor and graphics card settings:  
*"In 1995, I bought a Mitac multimedia machine," he writes. "Since then, I have upgraded the memory to 32Mb and I have recently*

subtractive colour theory of mixing colour as paint, and where the basic three are red, blue and yellow.

For example, 0,0,0 defines black, 255,255,255 defines white, 255,0,0 defines red, and so on. (When mixing real paint, mixing the three basic colours gives you black.) To get yellow using the RGB mix, you add red and green (255,255,0).

If you can't be bothered to work them out, or you find the whole thing rather confusing, a very easy way of seeing what you get is to use the Windows Paintbrush accessory. Go to the Options menu of the program and click on the Edit Colour option. This brings up a little dialog box with three slide bars, one for each colour.

As you move the slide bars, they show you the three RGB colour values and the resulting mixture. A similar utility can be found in the Color icon of the Control Panel.

*bought a 17in ADI MicroScan 5P monitor. I want to use it configured as 1,024 x 768 in 256 colours (minimum) at 75Hz.*

*"I changed the settings. I have to do it through something called Galileo in my Control Panel as I have no Display icon. Galileo gives me a Restart Windows option so as to enable the settings to take effect. I choose it, and the settings do indeed take effect — but only while I keep the darned computer on! Whenever I re-boot, I have to re-do the Hz setting which goes back from 75 to 56 interlaced.*

*"Cue the usual round of phone-calls. ADI sent me a disk with the ADI drivers on it. The company from whom I bought the machine in the first place sent me around four different parts of their empire — all different numbers, and at least one of which charges their time at 50p per minute. I managed to remain calm... just.*

*"My graphics card is a Sella S3 Trio 64.*

p248 >

## Colourful memories

The value of the memory needed is obtained by multiplying the area of the screen (in pixels) by the number of bytes in the colour depth, then dividing by 1,000,000 (to convert bytes into megabytes).

Size (pixels)	Colour Depth (bits)	Colour Depth (bytes)	Colours	Video RAM (Mb)
640x480	8-bit	1	256	0.307
640x480	16-bit	2	65,000	0.614
640x480	24-bit	3	16 million	0.922
800x600	8-bit	1	256	0.48
800x600	16-bit	2	65,000	0.96
800x600	24-bit	3	16 million	1.44
1,024x768	8-bit	1	256	0.786
1,024x768	16-bit	2	65,000	1.573
1,024x768	24-bit	3	16 million	2.359

*It does not seem to support the configuration I want to use on my monitor, or at least the 75Hz part of it. I am told I need a new graphics card which, of course, they will happily supply!*

*"Please could you explain a couple of things? Can I not simply try to re-install the Galileo part of the S3 Trio 64? The manual gives instructions in case the existing setup is in some way corrupted.*

*"Do I really need a new graphics card? If so, could you suggest something? Incidentally, I notice from the manual that it does say that some modes require more than 1Mb of video memory. How do I know what video memory my machine has?*

*"The quality assurance report states that the following memory was installed on my machine:*

*Installed memory: 7,808Kb*

*Base memory: 639Kb*

*AT extended memory: 7,168Kb*

*LIM Expanded memory: None*

*"With my new 32Mb of memory installed, I am now not at all sure what video memory I have."*

It seems your problem is likely to be a bad installation of the drivers and utility programs, so it's a good idea to re-install both the graphics card and the monitor drivers. This should fix the problem, if your graphics card supports 75Hz.

Updates are on the internet, too: check out [www.S3.com](http://www.S3.com), the web site of S3 Incorporated which manufactures your graphics card — and be careful not to use the Windows 95 drivers.

### Ready, get settings, go!

Rick Scannell's letter raises a number of basic issues, which we'll explain in detail for

the benefit of other readers.

Unlike Windows 95, Windows 3.x does not support or control monitor settings — it only controls and sets up graphics cards. This is why your Control Panel does not include an icon named Display. Monitors, being multisync devices, usually synchronise themselves to the signal coming from your graphics card.

Add-on programs supplied by the monitor manufacturer may independently send messages to the monitor via the graphics card to set up additional items such as brightness, contrast and colour balance. But settings about resolution (width-height in pixels), colour depth (256 colours, 16-bit, 24 bit etc) and frequency are characteristics set by the graphics card and its driver software.

How much RAM your computer has (8, 16, 32, 64Mb or whatever) is not related to the memory on your graphics card. Graphics cards have their own internal memory (that's the video memory to which you refer) and it is usually in values of 1Mb, 2Mb or 4Mb.

If you are buying a card, get one with at least 2Mb. This memory is responsible for the screen resolution and colour depth with which you can work.

The table above, "Colourful memories", sets out the amount of video memory required for particular resolutions and colour depths (the number of colours which can be displayed).

To hold a screen of 640 x 480 pixels (the small squares which make up your screen image), the graphics card needs to be able to store the colour information for each pixel.

This colour-depth information can be 1,

2 or 3 bytes, depending on whether you are using 256, 65,000 or 16.7 million colours respectively. To display 1,024 x 768 x 256 colours, you need to have at least 1Mb of video RAM.

Your monitor needs to be able to work at the same frequency as the graphics card or a higher frequency, and, ideally, should sync to it. So, your graphics card needs to be able to work at 75Hz when displaying at 1,024 x 768 x 256 colours. According to the S3 web site, which we visited, the S3 Trio64+ does, so check your graphics-card manual to see if your model does, too. This will tell you whether or not you need to upgrade the graphics card.

Finally, the sort of difficulty you describe in getting monitors to display as you want them to is not as uncommon as you may imagine, although your experience of having to re-set things at every re-boot must be galling.

### TV times

We really should not have a situation in which this kind of situation arises. Television would not be as ubiquitous as it is if each time you turned on your television set, you had to fiddle around for a few minutes to get the settings right. But we have to live with the fact that computers are not only more complicated than the average TV set, but their specifications are changing all the time. Perhaps one day, things will settle down!

### PCW Contacts

If you have any queries or Win3.1-related topics to discuss, contact **Panicos Georghiades** and **Gabriel Jacobs** at [win3.1@pcw.co.uk](mailto:win3.1@pcw.co.uk)



# Users in profile

Andrew Ward looks at user profiles: what they do and how to set them up. And what about MDAemon? It's a devilishly good program that collects mail on a small LAN server.

**R**eaders, Gordon Rogerson, raised a query regarding user profiles. In theory, it is possible to create a new profile by copying an existing one. Thus, you can set up one profile template which you then apply to other users, to save having to manually configure all the options. However, the mechanism to copy a profile doesn't appear to work very well.

User profiles retain things like settings for NT Explorer, personal program groups and their properties, network printer connections, any user-defined settings in the Control Panel and various other bits and pieces. Moreover, they can be used by any NT-specific application that is designed to be able to track per-user settings.

Profile data is stored within a directory structure (Fig 1), usually found under `%systemroot%\profiles`.

Thereafter, individual profile directory names tie in with user names unless someone has fiddled with the system to disrupt this usual state of affairs. For example, Microsoft applications keep my settings in

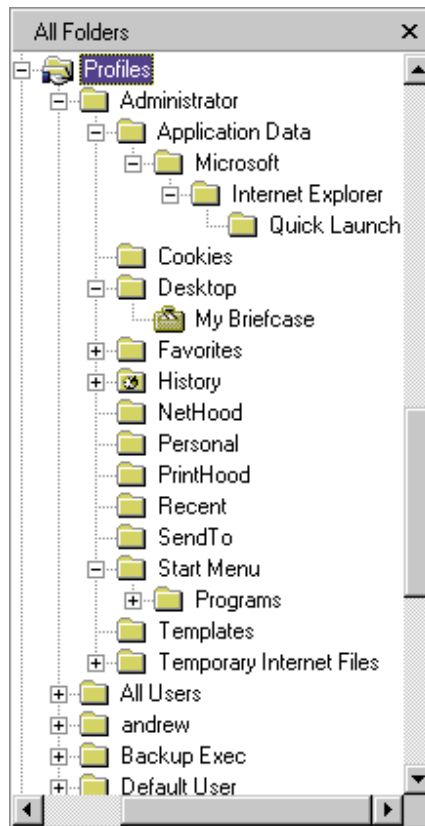
```
%systemroot%\profiles\Andrew\
Application Data\Microsoft.
```

The profile directory structure is fairly self-explanatory. I often edit it directly in order to tidy up my start menus, because of all those programs that fail to ask properly where in the menu structure you want them placed. But if you want to create a template and copy it, what you're supposed to do is use

```
Control Panel / System / User
Profiles
```

and then click on the Copy button.

First, you would need to create a share called Profiles (which will be the folder `%systemroot%\profiles`) and grant Full



Control to Everyone. Then you ought to be able to copy an existing profile template to `\\SERVERNAME\Profiles\NewUser`

Unfortunately, when you try this, you get the error message shown in Fig 2, as Gordon has observed, and the copy fails. (It does work if the profile from which you are copying is completely blank and therefore useless as a template.)

The problem seems to be that Windows NT has to carry out various bits of housekeeping when a new user profile is created. When you click on the Copy button, this housekeeping is not done. The only way I can find to ensure that it is done

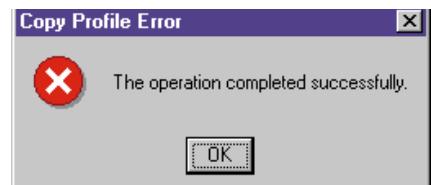


Fig 1 (left) User profiles consist of quite a large directory structure

Fig 2 (above) The presence of the word Error suggests that the copy wasn't completed too successfully

properly is to create a new user and then log on as that user. Windows NT then automatically creates a profile and updates the various registry keys that it uses to keep track of profiles.

Specifically, the profiles are listed by SID at:

```
HKEY_LOCAL_MACHINE\SOFTWARE\
Microsoft\WindowsNT\CurrentVersion\
ProfileList
```

So, it seems the only way to copy an existing profile is to create a new user, then log on as that user — this causes NT to create a default user profile — and log off again. Now, you can copy the user profile manually, simply by copying the directory structure in Explorer, for example from `%systemroot%\profiles\Template` to `%systemroot%\profiles\NewUser`

If you copy the directory manually before logging-on the new user, it doesn't work. All that happens is that Windows NT ignores the profile directory you created and makes a new one called

```
%systemroot%\profiles\NewUser.000
```

## Mail serving with MDAemon

One query that readers often raise is with regard to internet mail collection and re-



distribution on a small NT-based LAN.

Internet access itself is straightforward and can be carried out using something like WinGate or Microsoft Proxy Server or, rather more conveniently, the black-box approach of an ISDN router. However, that does not solve the problem of mail.

### POP goes the office

In the above scenario, everyone in the office would need individual POP3 mailboxes at the ISP (most ISPs do offer multiple mailboxes) and they'd all have to collect mail individually. Unless there were some sort of co-ordination, ten users on a LAN could be bringing up the router ten times more often than was necessary.

Furthermore, you don't have any way of sending mail to each other, apart from via the internet. Easy to do, but expensive in terms of phone calls.

One possible option is to install and maintain Microsoft Exchange Server, but that is not something everyone necessarily wants to undertake, just to make collection and delivery of internet email easier and to provide an internal mailing system.

But there's a \$99 piece of shareware which does the job extremely well. MDAemon is a very sophisticated package. Fundamentally, it provides both a POP3 and an SMTP server. If you have a dial-up connection rather than a permanent one, then you probably won't want to use the SMTP server at all — it will keep bringing up the line as it attempts to deliver mail. The ISP's SMTP server is better.

### Collection and delivery

Essentially, MDAemon works by collecting mail from various sources on the internet and redistributing it internally. Because it is a POP3 mail server, users can collect mail from the server with any popular internet mail package such as Outlook Express, Eudora or Ameol.

It works best when your ISP is aliasing all the mail for your domain into one POP3 mailbox. For example, mail to "anyone@award.co.uk" is held within one mailbox at the ISP. MDAemon can be configured to collect it from there automatically, at regular intervals, and redistribute it to everyone on the internal network.

In most organisations, individual users will have their own personal POP3 mailboxes, and MDAemon can readily be configured to collect mail from these using the multipop feature. For those users, it will

collect and pool all the email together in one place.

When MDAemon collects mail from the mail domain POP3 mailbox, it applies rules in order to sort it to individual mailboxes. Having to set up these rules would be pretty offputting. In fact, I've never had to set any up manually — MDAemon is usually intelligent enough to figure out for itself where mail should go.

For example, if I set up a local mailbox for the user Fred Smith (and by the way, you can have up to 5,000 local mailboxes), then mail collected for fred@company.com, or fsmith@company.com, or anything similar, will be automatically put in Fred's local POP3 mailbox.

### Flexible friend

When you configure MDAemon to collect mail, it's important to get the interval right. If you make it too long, people will get impatient; too short, and you'll be running up telephone bills. To overcome these problems associated with rigid fixed intervals, MDAemon allows a number of more flexible mail collection and delivery options.

For a start, priority mail (and you can define the rules by which MDAemon decides what is priority) is always delivered the moment it is encountered, regardless of scheduled mail-processing intervals.

The simple scheduling feature will cause MDAemon to process remote mail at a predefined interval after the last session, regardless of the cause of the last session. You can also set up predefined times and days for remote processing.

Other options include telling it to always send mail if there's more than a certain number of waiting messages, and to always send mail if there's a message sitting in the outbound queue that's older than a certain number of minutes.

### Remote control

If your internet connection is managed by RAS, MDAemon has a further clever option — it will watch to see if any other application uses the same RAS connection profile to bring the line up. If it does, then MDAemon can take advantage of this, and jump in and process remote mail when the line comes up.

Another useful feature of MDAemon is support for auto-responders — great when people are away on holiday or are ill, as well as for many other purposes.

## Finding security in books

John Taylor has asked about the *Windows NT C2 Security Administrator's Handbook* I mentioned some months ago. I've seen many a reference to it from within Microsoft documentation, but what I can't do is track down the publication itself. For those to whom security is important, you might like to consider the following books:

### Option Pack surprises

There were a couple of things that I didn't mention when I last featured the Windows NT 4 Option Pack and that's because Microsoft seems to have been keeping pretty quiet about them. Although Microsoft did produce a beta version of a news (NNTP) server a while ago, it quietly disappeared at about the same time Windows NT 4.0 was released (as far as I can remember). Specifically, the reason it was withdrawn and a release version never published was because apparently, Microsoft believed it would take sales from Microsoft Exchange Server. If someone wanted conferencing on an intranet, then Microsoft thought it ought to buy Exchange.

I think the net result of that policy must have been that sales of DNEWS, the very popular NTTP server for Windows NT, increased substantially. DNEWS is particular easy to configure and use, even for standalone use as an internal news server with no connections to other news feeds.

Anyway, the point is that hidden in the depths of the Option Pack, lo and behold, there is an NNTP server (Fig 3). There isn't much more to say about it, really. After all, the point about news servers is that they are standards-based, so there isn't a great deal of flexibility on the part of the vendor to offer anything out of the ordinary. As far as I can tell, though, it's purely a local NNTP server, with no scope for assigning feeds upstream or downstream.

It certainly seems to work and you can optionally configure it for secure access. All configuration of the NNTP server is carried out via the web browser, so can be carried out remotely: administrative tasks, such



**Fig 3 (left)**  
The NNTP news server that comes on the Option Pack CD



**Fig 4 (right)**  
SMTP server configuration via the web interface

Title	Publisher	Price
Windows NT 4 Security Handbook	Osborne/McGraw	£26.99
Windows NT Security	R & D Technical Books	£34.99
Windows NT Security Guide	Addison-Wesley	£24.99
NT Network Security	Sybex/Network Press	£55.99
Windows NT 4 Security, Troubleshooting, & Optimization	New Riders Publishing	£46.99
Windows NT Server 4 Security Handbook	Que	£36.99

• Available from Computer Manuals 0121 706 6000, or [www.compman.co.uk](http://www.compman.co.uk)

as adding a newsgroup, are easy enough to do.

The other handy little extra that comes with the Option Pack is an SMTP server (Fig4), useful if you have a permanent internet connection and don't want to rely on someone else's SMTP server.

### It's nice to share: so can you help with this obsession?

The idea of this column is supposed to be that you send in the problems and I answer them. But the other day, I stumbled across something to which I just cannot work out the answer, so I'm hoping that one of you more knowledgeable people out there will be able to help.

I'm one of those people who is obsessed about achieving an error-free event log. Fortunately for my sanity, I don't remember to look in it very often. However, I recently spotted a couple of errors which pop up each time the system is restarted (as rarely as possible, in my case). They were complaints that a share could not be recreated because the directory did not exist.

Now, this is not altogether surprising, since I had long since deleted the two directories in question but without first removing the shares.

It's easy enough to stop the errors from occurring by editing the registry. The shares are listed at the following location:

```
HKEY_LOCAL_MACHINE\SYSTEM\
ControlSet001\Services\ LanmanServer
\Shares
```

Just delete any that are no longer relevant. However, any registry editing is to be approached with caution; especially in an area such as this, which could prove to be fairly inconvenient if you make a mistake. For the life of me, I cannot find any other way to get rid of shares whose directories have disappeared. Can you?

The only official user interface to

creating and removing shares is via the Explorer, by right-clicking on a directory and selecting Sharing... from the drop-down menu. And once the directory has been deleted, this way in is obviously no longer available to you.

Of course, I shouldn't have deleted the directories within Explorer. The little hand symbol on the folder would have alerted me to the existence of the share, which I could then have removed first.

### PCW Contacts

Andrew Ward can be contacted at [NT@pcw.co.uk](mailto:NT@pcw.co.uk) or write to him at the usual PCW address (p10).

MDaemon for Windows NT is available from [www.mdaemon.com](http://www.mdaemon.com) and is priced from \$99.



# Danger zone

Chris Bidmead takes you to the next level of Tar to assemble a simple shell script. But watch out — using it in combination with the dd of Unix is very powerful and dangerous stuff!

Last month I said we'd move up to the next level of tar and assemble what we've learned into a simple shell script. But first there's one more primitive operation to add to our repertoire.

Using tar and mt in combination we now know how to position the tape and read, write and list archives. But it would also be useful to have a way of reading a single block of the tape, for example to take a look at individual headers without having to list the whole archive. That's what our script is going to do — move to the beginning of each archive in turn and read out the header to standard out.

The reading is done by a standard Unix utility called dd. Whereas most other utilities work on files, dd operates below the level of

the filesystem and shifts raw bits around. This makes it very dangerous as well as powerful, so be careful how you use it.

To read a block from the tape we use dd like this:

```
dd if=$TAPE count=1
```

if stands for input file. You'll remember that last month we set TAPE equal to /dev/nst0. The unstated default output file is standard out, which means it will come up on our screen. (The worst that dd can do with this default output is mess up your display. It only really gets dangerous when you start setting of=/dev/hda1, or something along those lines. Be warned.) Count, as you may have guessed, measures the number of blocks to read.

Now we're ready to put this all together in a script (Listing 1). If you've used the

method we talked about last month, for saving archives with a dated header, this script will usefully list all the headers together with the block numbers at which they occur.

With mt seek <blockno> you can quickly move to any archive, even on a huge 24Gb tape like the ones my HP-SureStore DAT24 uses.

### PalmPilot revisited

A couple of months ago I reported on how I use the 3Com PalmPilot in writing this column and promised I'd tell you more about

how I connect it into my Linux systems. There's a very comprehensive Pilot HOWTO on this, which you can pick up from the great Linux Documentation Project collection at <http://sunsite.unc.edu/LDP/HOWTO>, so I'll just give you the outline here.

The standard free software package is called "pilot-link" and I downloaded it from the RedHat site. You'll find a bundle of different utilities in there, including an X-based application called "pilot-debug" which requires particular versions of TCL and TK. This created dependency problems for me, so I installed the package with rpm's nodeps switch because I only needed the command line utilities. The workhorse among these is "pilot-xfer", a multipurpose utility that can backup your Pilot, install applications on it, and collect and install memos.

Pilot-xfer gives you a straightforward serial connection that can be used for uploading and downloading data files and Pilot executables. I found that the utility called "memos" was a handy adjunct: it exports Pilot memos in mailbox form, so you can manage them with a standard mail reader like pine or elm.

What this kind of link doesn't do is sync your Pilot and PC data in the same way as the Windows software. I've found this no great disadvantage, because Unix offers a variety of ways of keeping a particular file collection up to date. However, there's a completely different way of connecting the Pilot into Unix, using TCP/IP, effectively putting the little handheld directly onto the network. The endgame here is to use a 3Com software utility called Network Hotlink. In conjunction with another piece of Unix free software, this promises full Windows-style syncing.

I'm on the learning curve of this at the

## Listing 1 A simple shell script

```
#!/bin/bash
# wind through the tape stopping at each filemark
# to examine the next block, hopefully an archive
# label or a meaningful initial tarball entry

INPUT=$TAPE
EOD="<<eod>>"
BLOCK='mt tell | cut -f 3 -d " "'
DATA='dd if=$INPUT count=1 2> /dev/null'

mt rewind

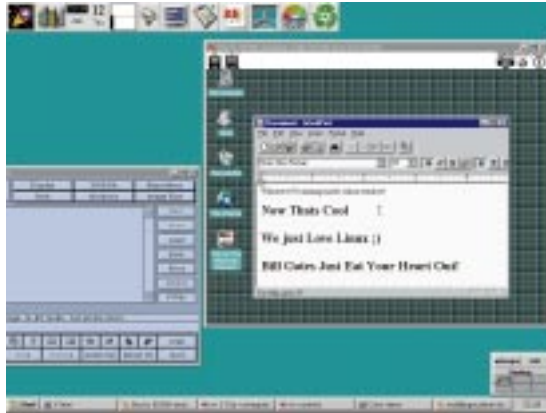
printf "\eval $BLOCK\t\eval $DATA\n"
while mt fsf 2> /dev/null ; do
    printf "\eval $BLOCK\t\eval $DATA\n"
done

printf "<<eod>>\n"
mt rewind
```



## Back to Bochs: Windows 95 under Linux

Of all the readers that responded to my suggestion (PCW May) of checking out the Bochs emulator (see [www.world.std.com/~bochs](http://www.world.std.com/~bochs)), Peter Goudman <[Peter@pgoudman.demon.co.uk](mailto:Peter@pgoudman.demon.co.uk)> seems to have come up with the most illustrative view of Windows 95 running under Linux. However, along with all the other reports I've had, he warns that it's very slow. You'll find this screenshot on Peter's web page at [www.pgoudman.demon.co.uk](http://www.pgoudman.demon.co.uk).



moment. I've established a usable TCP/IP connection using ppp down the serial port of my IBM PC315, but I don't yet have the 3Com Network Hotlink software because 3Com tells me it only sells it in the US. Yes, I was puzzled about that too, not to say somewhat miffed. However, I gather it is going to be bundled into the new Palm III.

If you're ahead of me on this, let me know. I'll keep you posted on my own progress.

### Another way around the ls problem

Remember the problem I had using ls to list a directory containing files whose names began with a dash (ls interprets the dash as introducing a command line switch)? Reader, Mark Peace <[MarkPeace@aol.com](mailto:MarkPeace@aol.com)> has drawn my attention to an elegant solution: "There's another way to get around the problem you had with ls: ls — \*.jpg. The dash (—) indicates no more options, so anything else is automatically interpreted as filenames. At least, it says this in one of my books for the rm command and it seems to work for ls, as well." It seems to work here too, Mark. Thanks.

### SuSE 5.1

Martin Houston <[mhouston@mh01.demon.co.uk](mailto:mhouston@mh01.demon.co.uk)> is someone I know many

readers of this column have reason to thank: he was the technician who put RedHat Linux on our cover disk last year.

Some months ago, Martin drew my attention to a new Linux distribution from Germany, which he feels is so good that he wants to promote and sell it over here.

He organised a review copy of SuSE 5.1 for me and I have to say I was impressed. It comes with the 2.0.33 kernel with fixes for the latest known bugs, including the famous Pentium F00F bug and the Teardrop attack TCP/IP vulnerability (if you don't know what these are, don't worry. SuSE stops 'em).

A particularly nice thing about SuSE for beginners is the way it allows you to install a small demo-mode version of Linux on an existing DOS partition, without having to do any reorganisation of your hard drive.

The distribution comes on four CD-ROMs, which leaves plenty of room for a lot of extras. Games archaeologists will be interested in the comprehensive collection of emulators for machines like the Atari ST, the Amiga A5000 and the various Commodores like the C64, the Vic20 and the Pet. The ROM images for these are not supplied for

copyright reasons, but the Commodore images are out there on the net. But thanks to an arrangement with Amstrad, the ZX81 and the Sinclair Spectrum ROM images are provided with the SuSE distribution.

Don't ask me if this emulation stuff is any good. I have a low tolerance for computer games and haven't tested any of it. You tell me. I'll pass the news on here.

You can get the full story about SuSE 5.1 at their [www.suse.com](http://www.suse.com) web site (well, it will probably be SuSE 5.2 by the time you read this). I'll just add a few impressions of my own.

The manual does much more than get you through the installation, it's a comprehensive overview of Linux as a whole. It also gets you started with emacs (my preferred text editor — I write all my PCW copy in emacs) and LaTeX, the text output formatting system based on TeX. One caveat: the English, evidently translated from the German, is quaint to the point where on occasion it gets in the way of comprehension.

And a warning if you're installing SuSE 5.1 on a portable like the Siemens Nixdorf Scenic Mobile 700 I'm using here. The installation didn't autodetect the i82365 PCMCIA controller but pulled in all the required software modules the moment I chose to PCMCIA to the setup manually. From this point, the installation was also able to detect my NE-2000 loookalike network PCMCIA card and brought up networking automatically. This part of the installation could hardly have been easier. Until the time came to reboot...

Now I was running the kernel installed on the machine and the network card was nowhere to be seen, which could have been a real showstopper for a beginner.

This is SuSE 5.1 as it installs right out of the box, using the fvwm2 window manager and some of the handy X utilities that come with the four-CD distribution (the icon bar down the left-hand side and the file browser window that bleeds off to the right both belong to TkDesk). You'll notice that I'm registered Linux User No 69082. The Linux Registration Page at <http://counter.li.org> isn't any kind of regulatory body, just an optional "stand up and be counted" statistics collection to give us all an idea of the number of actual Linux users. As most people don't register, the total is a guess, but current estimates run between six and seven million.



**Questions & Answers**

**Q** Where can I find help for a Unix beginner?

Law muk \_ ping.law@virgin.net

**A** Well, my column, for a start :-). It's a tough question, because Unix is deep and can be offputting at first. Get hold of a good, free Unix distribution — they generally come with a lot of documentation. Also check out [www.linux.org](http://www.linux.org). There are a number of beginners' books out there but many of them are expensive. Julie Williams, a reader of this magazine who works for an online book vendor, thinks I ought to tell readers about her company, Telegraph Online, at [www.telegraph.com/books/](http://www.telegraph.com/books/). No, this isn't anything at all to do with the national newspaper of that name, as you'll see from their web page.

Julie says her company is buying directly in dollars and using three flights a week from the US into Manchester airport to bring over the latest computer books and manuals at a discount. "We offer the following terms: 30 percent discount for a ten-day delivery, and a 20 percent discount for a three-day delivery," says Julie.

I'm wary about plugging goods and services of which I do not have any personal experience, but with that caveat

it does seem worth investigating. Make of that what you will, and let me know what you think.

**Q** Like many of your readers I have read your PCW column at a safe distance. I may try the Linux route but I have a couple of concerns...

Timothy McCarthy

"Timothy.MC CARTHY"@DG6.cec.be

... (I have treated each of Timothy's questions separately. See below).

**Q1** The software applications seem to be quite expensive, compared to Windows/Windows 95.

**A** Pretty well everything I use on Linux is free software (using "free" in the sense set out at [www.gnu.org](http://www.gnu.org)).

**Q2** Availability of some applications — little competition.

**A** Compared with, say, Windows, you can do much more with Unix without having to load "applications", Timothy. Having said that, I've been amazed at the rapid increase in the number of apps available for Linux over the past couple of years. Check out [www.linux.org](http://www.linux.org) and follow the links from there.

What was happening was that the PCMCIA driver modules were no longer being loaded as they had been during the installation. It took me several hours to work out what was going on (which is not to say you wouldn't have been able to work it out in five minutes, of course...).

I was assuming (*dread word*) that once the installation had been told about the requirement to service the PCMCIA controller, it would set up the init accordingly so that the relevant modules (`pcmcia_core.o` and `i82365.o`, in this case) would be loaded on every subsequent boot.

I understand from Martin Houston that this is indeed what happens when a PCMCIA controller is auto-detected during the installation. But news of my manual loading of the PCMCIA modules though SuSE's installation menus hadn't been passed on to the init sequence. With no PCMCIA manager to service the network card, it remained undetected and the networking software failed to come up.

I started fishing around among the init files to install the module loading by hand, but this is the wrong approach. It turned out that all you need to do is use YaST (Yet another Setup Tool), SuSE's comprehensive character-based system management utility, to install the PCMCIA package, and everything required in the init then falls into place.

I still regard the distribution's failure to set this up at installation time as a bug, but it's a minor one and may well be corrected in SuSE 5.2.

If you want to learn more about SuSE, full details are available at [www.suse.com](http://www.suse.com) and you can buy it direct from Martin Houston's page at [www.deluxe-tech.co.uk](http://www.deluxe-tech.co.uk) or from John Winter's Linux Emporium at [www.polo.demon.co.uk/emporium.html](http://www.polo.demon.co.uk/emporium.html).

**PCW Contact**

Email Chris Bidmead at [unix@pcw.co.uk](mailto:unix@pcw.co.uk)



## A fine fix

Terence Green has something nice for Warp fans: Warp Fix Pack and the Java Development Kit are both on this month's cover CD-ROM. There's help for SoundBlaster and Zip users, too.

**M**any readers have asked for Warp Fix Packs to be included on our PCW cover-mounted CD. Fix Packs are neither shareware nor freeware and we therefore require authorisation. IBM is a sizeable bureaucracy, and a previous attempt to seek approval ran into the sand last year.

However, we now have IBM's permission to put Warp Fix Packs onto our cover CD. The bad news is that owing to publishing schedules, we'll always be a couple of months behind. But that at least gives you time to see whether early adopters of new Fix Packs discover any problems. Also, remember the old adage: "If it ain't broke, don't fix it".

Before you decide to apply this Fix Pack, please see the whole README.1ST file. It contains important information. For example, if you wish to install JDK 1.1.4 you must install it before Fix Pack 6. If you are uncertain as to whether you need the Fix Pack, please peruse the README2 file as well, as it explains the problems which the Fix Pack addresses. Fix Packs are cumulative; you only need to install the latest version.

You will find the Fix Pack on our CD in a directory called FIXPACK6 as a series of \*.DSK (disk) images and README files. We have included a utility, FASTKICK.ZIP, created by Dmitry Nijforoff, with which you can install the Fix Pack from a hard disk instead of having to create disk images.

You will need at least 50Mb free and perhaps more if you decide to create a backup. Copy all the files from the CD-ROM to a temporary subdirectory on your hard disk. Extract the files from FASTKICK.ZIP to the same subdirectory. The README! file in FASTKICK.ZIP explains the procedure but omits to mention that DIUNPACK

automatically creates a /FIX subdirectory tree in the temporary subdirectory.

### Java Development Kit

We also have permission to include the latest Java Development Kit version 1.1.4 which upgrades Warp 4, Warp 4 Server, Warp 4 Server SMP and WorkSpace On-Demand to the current OS/2 JDK level. IBM's "Mr.

Java", Simon Phipps, says it is the fastest Intel-based Java Virtual Machine.

The JDK can be found in a subdirectory called JDK114 as a ZIP file. The subdirectory also includes the latest Netscape for OS/2 (dated 10th February 1998) and the OS/2 Feature Installer which you need in order to install the JDK. Install Netscape, then Feature Installer, before installing the JDK.

IBM's Dave Mounce deserves a vote of thanks for organising this package. Please visit the IBM Java Centre at [ncc.hursley.ibm.com/javainfo/hurindex.html](http://ncc.hursley.ibm.com/javainfo/hurindex.html) for further information before installing the JDK.

The Java 1.1.4 JDK for Warp is a 29Mb file which decompresses to 50Mb. It includes IBM's port of Sun's JDK plus toolkit, samples, runtime, debugger and Unicode font — everything you need to run



For all the details on Java and programming with VisualAge for Java:Entry, travel to IBM's central Java site at [www.software.ibm.com/ad/vajava](http://www.software.ibm.com/ad/vajava)

any Java application on Warp 4.

IBM does not support the use of the JDK on Warp 3, but it has been reported in the OS/2 newsgroups that it works on Warp 3 with FixPack 29, or later, applied. Due to space considerations, Fix Pack 35 for Warp 3 will be included on next month's PCW cover CD-ROM.

### Now hear this!

I have received several requests for SoundBlaster information. Here are some pages which should help:

- Colin's AWE32 page at [www.ionet.net/~colin/awe32.html](http://www.ionet.net/~colin/awe32.html)
- Rod Smith's sound card page at [www.users.fast.net/~rodsmith/sound.html](http://www.users.fast.net/~rodsmith/sound.html)
- Also have a look at Timur Tabi's advice for people looking for a new sound card or who have, or are considering, a sound card





For the low-down on Java technical details, the IBM Centre for Java Technology Development at [ncc.hursley.ibm.com/javainfo/hurindex.html](http://ncc.hursley.ibm.com/javainfo/hurindex.html) is the place to go

based on a Crystal chip: [www.io.com/~timur/crystalos2.html](http://www.io.com/~timur/crystalos2.html)

- If you have access to newsgroups, look into [comp.os.os2.multimedia](http://comp.os.os2.multimedia) as well.

Andy Graham-Cumming is happy enough with his AWE32 PnP sound card but couldn't get the Creative Labs mixer working in Warp. The IBM Warp help desk couldn't help him and neither can I. Perhaps a reader knows?

I did notice an OS/2 mixer listed on the excellent German LEO software depot at [ftp.leo.org](http://ftp.leo.org) in the OS/2 section at [pub.comp.os/os2/leo/Sound](http://pub.comp.os/os2/leo/Sound) for a file called `sound/mixo101a.zip`.

#### Changi — read all about it

Andy saw my PM Mail recommendation and wondered whether I'm not a PostRoad fan? Truth is, I'll recommend anything to get attention! There's plenty of choice for OS/2 users and in my job I never get a chance to settle down with anything for too long.

Lately, I've been playing with Changi. This is a cool NNTP news server that you can run locally on Warp. I use it to download selected news from Demon Internet, after which I can play with various newsreaders locally.

Details from [www.egnite.com](http://www.egnite.com).

#### Help with LAN queries

Colin Haynes, who previously worked in network support, has offered to help out with LAN queries. If you've been told that Warp doesn't mix with Windows NT, Win95 or NetWare, don't believe it. Send your queries to me, and I will pass them on.

#### Zip and go

Lots of response to the Zip story (*PCW*, April). The Zip Plus works fine with a SCSI adapter or with Iomega's Zip Zoom card. The good news, from Simon Wheatley, is that Zip Plus on a Zoom card using the OAD drivers is "really quick". Neither Simon nor Mike Franklin had any more luck than I did when attaching it to a parallel port, though. Essentially, the Zip Plus does not work on the parallel port in OS/2.

Clive Shearsby reminded me that the older Zip Parallel drives do work with the OAD drivers. He plays Doom from a Zip drive under Win95 or Warp and it takes a second or so longer to load under OS/2.

#### PCW Contact

Terence Green can be contacted by post via the usual PCW address (p10) or by email at [os2@pcw.co.uk](mailto:os2@pcw.co.uk)



# Doing it by numbers

Unnumbered paragraphs, hanging punctuation and how to silence “paperclips” are among the ticklish problems tackled by Tim Nott, as well as questions from a student and a teacher.

In March's column I boldly replied to Brendan Breen's problem in having separate, unnumbered paragraphs inside a numbered list with the assertion that “styles are not the best answer”. I'd like to thank Adrian King for putting me right on this. He wrote: “A cleaner and more flexible solution is to use heading numbering for his numbered paragraphs and other paragraph styles for the non-numbered ones, each of which has a greater left indent.”

In other words, each paragraph intended to be numbered is formatted with an appropriate Outline Level attached to its style. Those which don't are formatted with a matching indent but with no numbering, and at “Body Text” outline level. The advantage of this is that the numbering can easily be taken down to sub-levels, each with its matching, non-numbered style. Numbering is automatically adjusted as you drag-and-drop paragraphs around, and cross-references to numbered paragraphs are automatically updated (Fig 1).

In April's column I mentioned Steve Peterson's problem in getting the mathematician's abbreviations for “Therefore” and “Because”. Although, as mentioned at the time, there are specialist fonts which include these symbols, two readers have offered alternative solutions.

Jean Elliot suggests typing three full stops, then using the Character Spacing tab of the Word Format Font dialog to raise

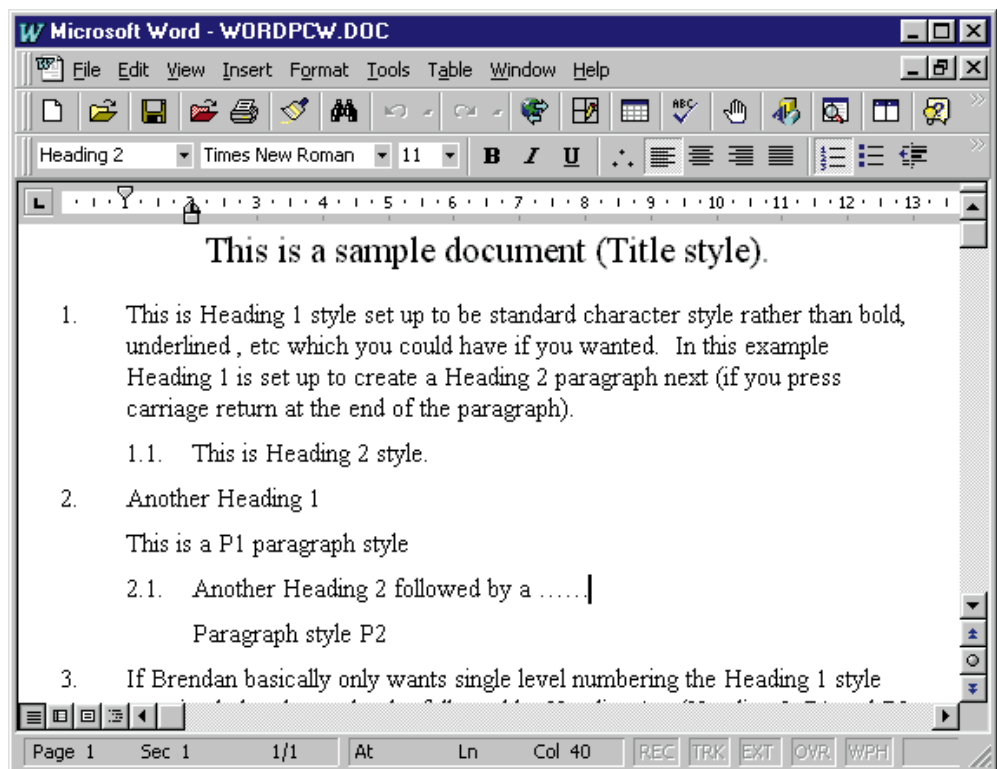


Fig 1 Numbered and non-numbered paragraphs done in style

the central one (for “Therefore”) or the other two (for “Because”) by four points.

Frank Peelo's suggestion was even simpler: just superscript the relevant stops. This has the advantage of being generic in that it will work in any WP which supports superscripting, including Windows Write and, if I remember correctly, LocoScript for the Amstrad PCW. Alas, Windows 95 WordPad doesn't support superscript. One thing to remember, in Word at least, is that the Autocorrect feature (if turned on) will replace three full stops by an ellipsis (i.e. three dots in a single character). Frank's cure was to type spaces between the dots, then delete them, but it's much easier to hit

Alt + Backspace after typing the third stop, which undoes the autocorrection.

If you want to do it all with keystrokes, then here's the incantation for “Therefore”, using the Word default shortcut key settings: Full stop, Control-Shift-Plus, Full stop, Control-Space, Full stop, Alt-Backspace. You can of course record this as a macro and stick it on a toolbar. Many thanks to David Grant and David Kelsey who had similar suggestions, and to anyone who mailed after the deadline.

## Hanging debate

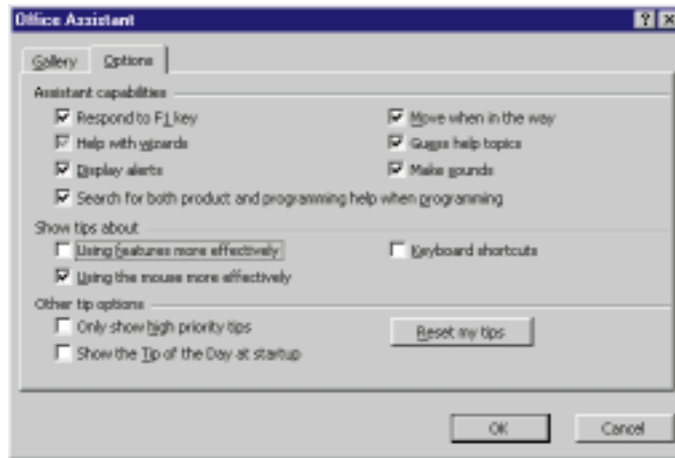
Another matter arising from April's column was hanging punctuation. That is,

Questions & Answers

**Q** “It looks like you’re writing a letter” — please, how do you turn off this horrible intrusion? Even if the Microsoft Office Assistant is closed, the paper clip pops up when I type ‘Dear Someone...’”

Bob Monroe, Perugia

**A** Open the Office Assistant and hit the Options button. Or if the assistant is already open, right-click on the box and select Options. In the Options tab of this dialog you’ll find a number of aids (or annoyances) that you can disable. Untick “Using features more effectively” (Fig 2).

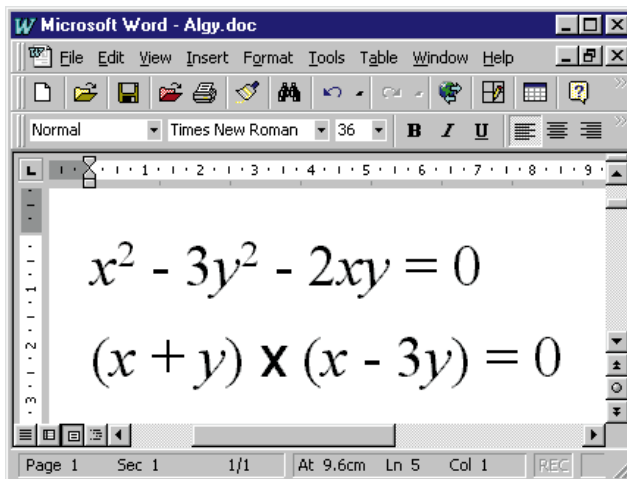


**Fig 2 (left)** Looks like you’ll write your next letter undisturbed by the Office Assistant **Fig 3 (below, left)** Algebraic letters, all done with the standard windows fonts **Fig 4 (bottom)** If you save it as Word 2, Q&A can open it

**Q** I am a maths teacher and I’m looking for fonts containing an “algebraic” x? i.e. one seemingly made from 2 “c”s back-to-back? I always avoid “x” in any algebra due to the obvious confusion with multiplication.

Duncan Smith

**A** I can find nothing specific, but I think the easiest way is to use the italic form of a serif font. Times New Roman works well (Fig 3): you’ll see it’s a completely different set of characters, not just a slanted version of the normal font. If you use the Arial “x” for the multiplication sign, there should be no confusion.



create an automatic reference list in Word 97, as I refer to authors and dates in essays. I have tried many methods but have been unsuccessful, as I have been unable to edit it later in order to add the book or journal details.

Bren Holmes

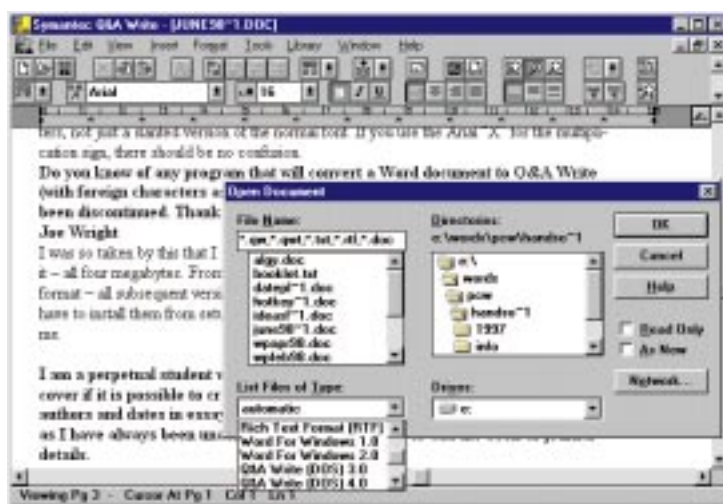
**A** If you highlight a word, then Insert, Footnote... you get a choice between footnotes (same page) or endnotes (end of section or document). Choose the latter, and you can have your list at the end of the essay, for instance. To edit this you have a choice. If you’re in normal view, turn on Footnotes from the view menu. You’ll see

your notes in a separate, editable pane at the bottom of the screen. Alternatively, in Page Layout view, you can see and edit the footnotes or endnotes in situ.

**Q** Do you know of any program that will convert a Word document to Q&A Write (with foreign characters as well)? We used to use Word for Word but it’s been discontinued.

Joe Wright

**A** I was so taken by this that I dug out a 1993 copy of Q&A from the archives and installed it — all 4Mb. From Word, save a copy of the file either to RTF or Word 2 format (Fig 4). All subsequent versions of Word come with filters to do this (though you may have to install them from setup). Q&A will open files in either



format, at least it did for me, and any normal ANSI (but not the extended Unicode) characters will be preserved.

**Q** I am a perpetual student with frequent assignments to write. I would like to discover if it is possible to

(and indeed Excel 97) as a standalone program?

Jon Blower

**A** If you mean can you create standalone programs with it, no. They have to be stored as macros in an Office document or template. ➤



## Questions & Answers (cont'd)

**Q** All my documents based on Normal.dot start with US English spelling as the default. I've looked everywhere but cannot find the culprit.

**Veronica Waldorf**

**A** This could be for one of two reasons. First, open Normal.dot. Go to Tools, Language, Set Language... Check that UK English is set as the default language, and if not, rectify this. Next go to Format, Style... Select the Normal style and make sure this is set to UK English. If this doesn't appear in the Description details, then hit the Modify button, then the Format button, then Language to change it. You may also need to check other styles if they are not based on the Normal style.

**Q** I have created a Word template which has my letterhead on the first page but a "continued" header on subsequent pages. The problem is that most of my letters are single page, so when I print I have to remember to

delete the extra page, otherwise I waste a sheet of paper. Is there a smarter way around this?

**Jerry Greisky**

**A** You're almost there, but for the benefit of other readers we'll do the whole thing step-by-step.

First, create a new template based on a blank document.

1. Go to File, Page Setup, Layout, and tick Different First Page in the Headers and Footers section.
2. Make sure you are in Page Layout view, then select Header and Footer from the View menu. Type and format your letterhead the way you want in the header.
3. Close the Header and Footer toolbar (or deselect from the view menu) or click outside the header to get back into the letter template body. Type whatever you want to appear in every letter: e.g. placeholders for a date, "Your ref./Our ref:" or "Dear...".
4. Now insert a page break, either from the

Insert, Break... dialog or by pressing Control + Enter. It helps here if you make all non-printing items visible from Tools, Options, View.

5. Go back to headers and footers and you should find a new, empty header on page two; if you're still in the first header, use the Next button on the H & F toolbar. Type and format the text you want here, e.g. "Continued". Note that you can also adjust the size using the vertical ruler.
6. Exit Headers and Footers and save the template.
7. Now here comes the clever bit, so *SOMEBODY WAKE UP GERRY* who has already done all of the above. Select the page break and delete it. Then save the template again and close it.
8. That's it. No more pages will be created, but if a letter based on this template stretches to more than one page, the subsequent pages will bear the alternative header, which the template will "remember" despite only having one page itself.

punctuation marks at the end of a line of justified text which fall outside the margins. I hadn't a clue how to do this, or even why, so I put it out to tender.

John Goldfinch is the only reader to have replied so far and he reports that you can do this in Adobe Illustrator. This is a little off-topic for a WP column, but I thought I'd pass it on, anyway.

Fans of Paul Herber's Diacrit (the applet

which inserts custom symbols into any application) will doubtless be cheered to know that a specific Win95 version is now available from [www.pherber.com/share/diacrit.html](http://www.pherber.com/share/diacrit.html). The bad news is that it still only supports the standard ANSI character set.

### Euro update

More good news for those committed to a single European currency. I've been using a

beta of Windows 98 for the last few weeks and all the core fonts appear to contain the Euro symbol. Not only that, but it's been moved down to ANSI 128, which is a spare slot in most typefaces. This means you can access it in any application, either via the character map by holding down the Alt key and typing 0128 on the numeric keypad, or by using its own shortcut: Alt-Control-4.

### Out to tender...

Professor John Butt of King's College, London, produces a lot of documents with two or more columns, using Word: "Very often I also have to insert a footnote in one of these columns. The result is that the footnote's text has the same width as the column, which I do not want, but I can find no way of getting rid of column format in the footnote." And after a lot of messing about, neither can I. Single-column endnotes at the end of a two-column document, yes, with a section break before, but not at the bottom of the current page. Anyone have any suggestions on this?

## OK corral

Have you ever counted the number of times a day that you press an OK button? More to the point, have you ever wondered whence this expression derives?

Well, there is a wonderful variety of plausible-sounding etymological theories. Most authorities agree it came into common usage in America, around 1840. Some maintain it derives from the Choctaw Indian "okeh" meaning "it is". Others claim it comes from an African tongue: in Mandingo "oke" means "all right" and in Wolof "waw kay" means "yes indeed". Other theorists claim it as an original American English coining, either as a jokey abbreviation for "Orl Korrect" (sometimes attributed to the less-than-literate General Andrew Jackson) or from the political campaign of Martin Van Buren whose nickname was "Old Kinderhook". Further-fetched theories include the Greek "olla kalla" ("all good") or "only kissing". No lesser an authority than my dentist insists it derives from battle reports: "Zero killed".

I have my own theory, which I hope lovers of cheap red wine will share. There is a region of south-west France known as the Languedoc, where even today the Occitan language is spoken by some. However, in medieval times it was far more widespread: roughly speaking, all those living north of the river Loire spoke the Langue d'Oui, while those to the south spoke the Langue d'Oc. The distinction derives from the way each group pronounced the word for "yes". So it was probably still very common in the 16th and 17th centuries when there was widespread French colonisation of Canada. In 1755, the British having taken control of the province of Acadia, deported many of its French-speaking inhabitants to Louisiana, where the Acadians became Cajuns and, I reckon, "Oc" became "OK".

## PCW Contact

You can contact **Tim Nott** by post via the usual PCW address (p10) or at [wp@pcw.co.uk](mailto:wp@pcw.co.uk)



# Weather wise

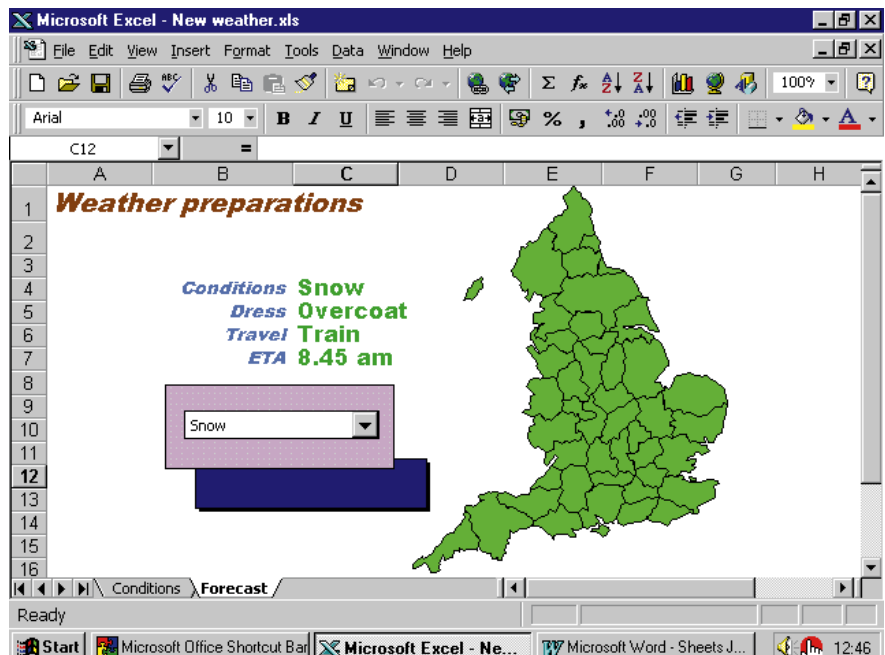
Using built-in tools you can have a worksheet list box which will let you take text from the box and put it in a cell, as it appears on-screen. Stephen Wells gets clever with weather.

**W**henever possible, I always think it's best to let the built-in tools of a spreadsheet accomplish as much as possible before writing macros. Here's a typical example.

Will Luke writes: "I am having a problem with Excel 97. I have a list box with data in it. I need to take the text from that list box and put it into a cell. I have tried using the ListBox ("ListBox 7") value method but this only displays the number of the item in the box. I tried using list box text, but it is not recognised. In the box is 'Rain', and 'Snow'. How can I tell the dialog box to enter the text of it, as it appears on-screen?"

To be pedantic, Will's difficulty is not presented by Excel but by VBA. If all he needs is a list box on a worksheet, it is very easy to create.

- First, design your display area. The example in Fig 1 uses the area A1:H16.
- Now go to another area of this sheet, or, as in this case, open another worksheet, and enter your data. Here, it is entered as in Fig 2 with weather conditions in column A, recommended dress in column B, suggested mode of travel in C and estimated time of arrival in D. This is all just to create an example, obviously. We'll call the display sheet "Forecast" and the data sheet, "Conditions".
- Select A6 to A12 (in other words, the first label and one more row than your list).
- Choose Insert, Name, Create. Press OK. This gives the range the Name, Conditions.
- Now select the range A7:A12 (not A6:A12) and the Name, Conditions should appear in the Name box. There is no reason why a sheet, label and Name can't use the same word, as here.
- Select A7 to D12. Choose Insert, Name, Define. Give the range the Name,



**Fig 1 (above)** Without any programming on your part, Excel will create a drop-down list box for choosing data from a list

**Fig 2 (right)** The conditions in column A will appear in the list box. When one is selected, the other items will appear in the Forecast sheet

	A	B	C	D
1				
2				
3				
4				
5				
6	Conditions	Dress	Travel	ETA
7	Snow	Overcoat	Train	8.45 am
8	Rain	Raincoat	Car	8.30 am
9	Drizzle	Umbrella	Bus	8.50 am
10	Windy	Duffelcoat	Taxi	8.25 am
11	Sunny	Jacket	Walk	9.00 am
12				
13				
14				
15				
16				
17				

Recommendations. Click OK.

- Select the range A7:D12 again and the Name, Recommendations should appear in the Name box. Now Name cell L1 on the Forecast sheet, Current. This cell just holds the index number of the current data. When Snow is selected, it will read 1.
- Display the Forms Toolbar and draw your

List Box. (Later, you can position it where you like.) Right-click in the box and choose Format Control.

- Enter Conditions as the Input Range, and enter Current as the Cell Link.
- In cell B4 on the first sheet, enter `=Conditions!A6`
- In B5, enter





## Questions & Answers — XLS

**Q** I've imported a list of phone numbers and lost the initial zero on some of them. What is the fastest way of adding it?

**A** Click on the column letter. Format the column with the Custom Format, "0"0. Excel will intelligently ignore those numbers which already start with a zero.

**Q** If I click the Name Box side arrow, a list of Names drops down. But in Excel 97 they are not available when I try to insert them in a formula like they were in Excel 95.

**A** Start the formula with an equals sign. Then press F3. A list of all the current Names is displayed and you can select one to enter automatically in your formula.

**Q** How can I add the Euro symbol to Excel?

**A** Microsoft currently offers a newer version of the TrueType Tahoma regular and bold fonts with a Euro symbol for Office 97.

Download the file, Tahoma.exe, from [support.microsoft.com/support/downloads](http://support.microsoft.com/support/downloads). When you click on it, this file

expands to provide the two necessary .ttf files and a readme file with instructions for replacing your existing Tahoma fonts. Using any font, you could also create a custom currency format, simply replacing the £ sign with EURO.

**Q** What is that yellow diamond for on the side of a WordArt object?

**A** If you click on it and drag it up or down, you can change the perspective of the original design. This option increases the number of available title designs almost infinitely.

Excel 97 workbooks, saved in their own format, have features that cannot be saved if you are using an earlier version of Excel. If you try to open an Excel 97 file with an earlier version of Excel, you can only open the workbook to read, not change. You need Excel 97 to open a fully-featured Excel 97 workbook.

Another feature of Excel 97 is that you can protect, with a password, workbooks which are shared on a network. Alternatively, you can allow entry without a password but keep track of changes everybody makes in a changes history record. Later, you can remove a workbook from shared use and erase the stored change history.

### You just gotta do DAT

You often read advice to backup your Registry files at intervals. It is an essential part of computer management and just as important as normal end-of-session data backup, because hard drives can fail at any time. You might make the backups in any number of ways: using Microsoft Backup or comparable software from another publisher; storing as a text file; copying as is; or compacting the files with a utility such as WinZip.

The key files are SYSTEM.DAT and USER.DAT, filed in the Windows directory. If they are hidden, you can right-click on Start and choose Explore, View, Options and select "Show all files". Before copying them, right-click on them individually, select Properties and remove the check marks from Hidden and Read only. Press OK.

So far so good. What you seldom see is guidance on restoring the files. The important thing to remember is that their

## Book Review

**Title** Excel 97 Fast and Easy

**Price** £15.49 (352 pages)

**Publisher** Prima

**Contact** Computer Manuals (see "PCW Contacts", below).

You know what a beginner with Excel needs? A picture book which shows them exactly what they will see on the screen, starting with the first click of the Start button. That's what you get with *Excel 97 Fast and Easy*, one of the new Visual Learning Guides from Prima Publishing. This one was written by software trainer, Nancy Stevenson. She's also a video producer, making her the logical choice of author for a book which has almost twice as many illustrations as pages.

The book runs through everything involved with making worksheets, telling you what to do, illustrating what should appear on your screen. It covers data entry, using the Formula Palette, formatting, saving, printing and exiting. It introduces you to wizards, templates, macros and adding clipart and WordArt. It shows you how to make a chart, with special effects and maps. There are simple explanations for integrating Excel with MS Word documents and a web page. This book even tells you how to customise the financial statement templates which are included with Excel but which few other authors mention.

This is not a book aimed at advanced users. There is no mention of PivotTables, for instance, or VBA; the macros are created using recorded keystrokes. But that's understandable in a book subtitled *Fast and Easy*. It would be ideal to keep in the office.



extension must be DAT; if they are stored with another extension, change it to that. Then transfer the files to the Windows directory. Whether you then right-click on the filenames and choose Properties and restore the attributes to Hidden and Read Only, is up to you. Restart Windows for them to take effect.

The very first system file, created when you installed Windows 95, is probably called SYSTEM.1ST and stored in the C:\ directory. If you are troubleshooting, you could save your current SYSTEM.DAT file with another extension, and rename SYSTEM.1ST file as SYSTEM.DAT and transfer it to the Windows directory. But there will be an awful lot of information about your current software settings

that it won't contain.

A word of warning: a file with an REG extension contains an exported Registry. *Do not double-click on it.* That will not only start REGEDIT.EXE, but will also automatically import data into the Registry without waiting for confirmation. Instead, to open the file, right-click and choose Edit.

## PCW Contacts

**Stephen Wells** welcomes problems or solutions relating to spreadsheets. Write to him at the usual PCW address (p10) or email [spreadsheets@pcw.co.uk](mailto:spreadsheets@pcw.co.uk)

**Computer Manuals** 0121 706 6000  
[www.computer-manuals.co.uk](http://www.computer-manuals.co.uk)  
**ICS Learning Systems** 0500 888004  
[PGUCTraining@ics-uk.demon.co.uk](http://PGUCTraining@ics-uk.demon.co.uk)



# Behind the **mask**

Mark Whitehorn tackles postcode masks and presents solutions to validating postcodes, showing how to override input masks when they are inappropriate. Plus, fiscal formatting.

**I**n the April issue,

Peter Chleboun asked about postcodes and validation thereof.

I wrote that the subject had been covered previously in the column and the conclusion then was that no input mask would do the job; what was needed was some code.

Peter also asked: "If you get the code right for the UK, is it possible to 'override' masks when not appropriate (e.g. use US Zip code instead when the contact happens to be in the US)? Obviously, widening the conditions invalidates the point of having the code in the first place! The alternative to having two fields per record seems like a waste, and anyway, I have contacts elsewhere in Europe with codes that match neither."

So, we have two problems: 1. How to validate postcodes, and 2. How to override input masks when not appropriate.

## Solution to problem 1

The following arrived from Ken Sheridan <KenSheridan@compuserve.com>:

"The good old postcode chestnut rears its ugly head yet again (PCW April)... (Can a chestnut rear its head? Discuss — MW) "...The latest incarnation of this in the CompuServe Access forum produced some codes from Colin Byrne..."

I contacted Colin directly and asked whether I could publish the code. He was hesitant, not because he is unhappy to share the information, but because he was concerned that some of it might be under the copyright of the Royal Mail.

## Fig 1 Firing up the routine

```
Sub Post_Code_Exit (Cancel As Integer)If Not IsNull([Post Code]) Then
  If Not IsValidUKPostcode([Post Code]) Then MsgBox "Invalid postcode format", vbInformation
End If
End Sub
```

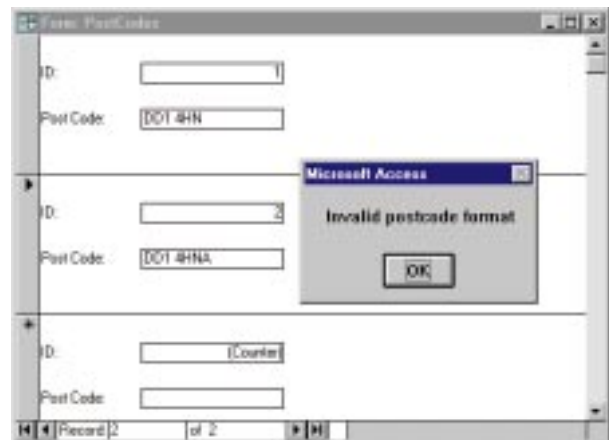
I checked this with Royal Mail Customer Services, where Samantha Travis assured me that all was well. Indeed, she faxed me the information (which follows) regarding postcode formats. I include it not because Colin hasn't used it — indeed, he has included it as part of the comments in the code — but because it is essential information for those who wish to implement similar code in something other than Access. Each postcode consists of two parts: the first part is the Outward Postcode (Outcode) which is separated from the Incode by a space.

Below is a list of the valid formats of a Postcode. An "A" indicates an alphabetic character, "N" a numeric character.

Outcode	Incode	Example
AN	NAA	M2 5BQ
ANN	NAA	M34 3AB
AAN	NAA	DN5 7XY
AANN	NAA	DN16 9AA
ANA	NAA	W1A 4WW
AANA	NAA	EC1A 1HQ

Note: The following characters are never used in the Incode: C I K M O V.

Colin Byrne <100551.2730@



**Fig 2** The form that uses Colin's code to detect invalid postcodes

Compuserve.com> included the following information in an email: "Here's the final code. I have removed Access 95/97 specific elements (Boolean and CBool) so it should work with all versions. It has been tested in Access 2 and 97 but if you spot anything (errors or typos), let me know."

The code is on our PCW CD-ROM this month as COLIN.TXT. I also popped the code into an Access 2.0 database with a trial table and form (COLIN.MDB). Colin's routine is fired by the On Exit event using the code shown in Fig 1. I wouldn't pretend that this form is sophisticated or properly error-trapped, but at least it gives you a form that works (Fig 2), which is a good place to start .

**Solution to problem 2**

Thomas Bennet came up with a solution which uses a table to store relevant formats:

Category	CodeFormat
UK_NI	ll nn nn nn l
UKPostal	lln nll
UKPostal	llnl nll
UKPostal	llnn nll
UKPostal	ln nll
UKPostal	lnl nll
UKPostal	lnn nll

and therefore it can be used to validate formats from several countries.

I have put this solution on our cover-mounted CD-ROM as an Access 97 database called THOMAS.MDB (Fig 3).

A similar sort of solution was sent to me by Daryl Burns <darylburns@yahoo.com>: "With reference to the piece in the April edition of Hands On Databases ('Postcode validation'), I have a solution to the problem of using separate input masks, depending on the country.

"It simply uses a table, entitled Countries, which contains the following fields:

- CountryCode (which uses the same codes as in the Microsoft Access Input Mask builder);
- Description (England, USA, France etc); and
- PostCode mask."

This is on our CD-ROM as DARYL.MDB. I have included this despite it not being a perfect solution to the postcode problem. Indeed, because it relies on input masks, I don't believe it can ever provide a really secure mechanism to prevent the input of incorrect postcodes.

However, what it does demonstrate rather neatly is a way of altering the input mask that is to be used for one field, by making a selection in another field.

In Daryl's example, you can first select the country — UK, Norway, Switzerland, whatever — from a "Country" field, whereupon the input mask for the "Postalcode" field automatically changes to the appropriate mask. This facility seems to me to be applicable to a whole raft of uses apart from postcodes (Fig 4).

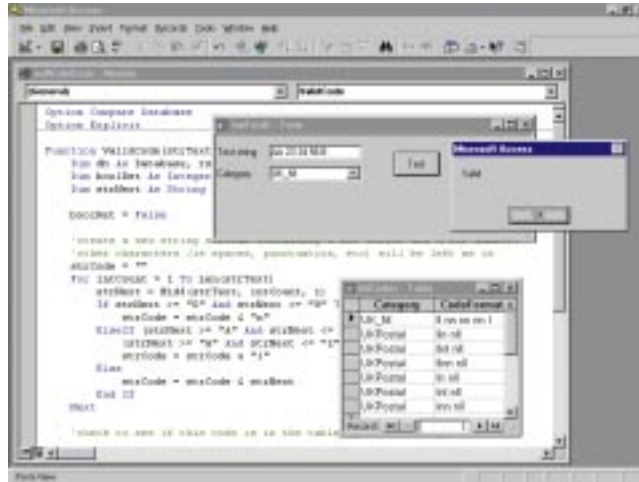


Fig 3 (left) This shows Thomas Bennet's system which allows the input mask used for a given text box (in this case, "Test String") to be controlled by the selection in a combo box

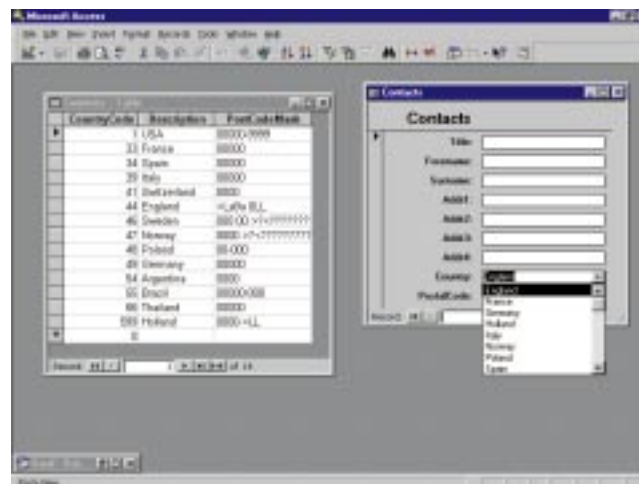
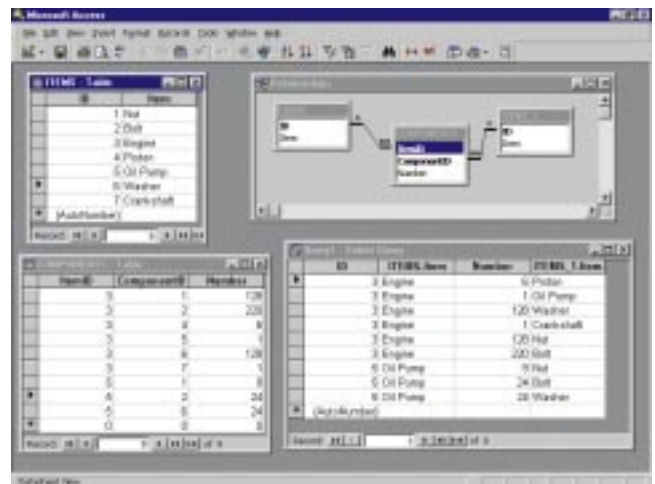


Fig 4 (left) Daryl Burns' sample database which allows you to choose a country and hence a given postcode mask

Fig 5 (right) One way of managing objects that can contain other objects that can contain...



**Blackpool rock**

Also in my April column, Nigel Collins added a throwaway question to his letter: "...Does anyone know why the Blackpool area uses FY as its letters?..."

Ray Downing <RayDowning@aol.com> answered with: "Reference Nigel Collins' query, FY = Fylde as in Fylde

Coast." James Campbell <james@zeugma.force9.co.uk> provided a similar answer: "FY is something to do with 'Fylde', as in the nearby town of Poulton-le-Fylde. There

**Fig 6 The SQL query for components**

```
SELECT ITEMS.ID, ITEMS.Item, COMPONENTS.Number, ITEMS_1.Item
FROM ITEMS AS ITEMS_1 INNER JOIN (ITEMS INNER JOIN COMPONENTS ON ITEMS.ID = COMPONENTS.ItemID) ON ITEMS_1.ID = COMPONENTS.ComponentID;
(> line continued)
```



## Access denied! Tips and tricks from other places

### ■ Sorting in FileMaker Pro

As all good geneticists know, genetic diversity in a species is usually a "good thing". By the same token, RDBMS diversity in this column is a good thing because not everyone is an Access freak.

Difficult as it is to believe, some people don't spend their evenings working out how to enter postcodes into Access! Weird, isn't it? Those other people, or "normals" as we can call them, spend their evenings on more socially acceptable pursuits like working on how to enter postcodes into FoxPro or FileMaker Pro. So, I welcome tips and tricks from other packages (as long as they fulfil the usual criteria of being generally interesting).

Here to prove it are a couple of snippets from beyond the Access gene pool:

Andy Schwarcz <[andy@accsoft.com.au](mailto:andy@accsoft.com.au)> has provided one for FileMaker Pro — a script for sorting numbers. The script itself is too long to print here, so I have included it on our cover-mounted CD-ROM as a text file (andy.txt) which also contains some explanations from Andy about how the script works.

### ■ FoxPro code

"I thought I might drop you a code sample in VFP — just to give your articles a short break from Access <s>. The attached\* prg file can be modified to give custom export of text files from dbf files.

"This program came about as a result of a query on one of the Usenet news groups — someone wanted to control output of the numeric value 0.

For example, if the fields in a record contained: Matt / 11 / 0 / Mark

— he wanted to output Matt / 11., / Mark

— instead of Matt, / 11, / 0, / Mark

The VFP command 'Copy to...' can't handle this, unfortunately.

"The program uses FoxPro's low-level file functions to create a text file and works on the currently selected table. The code is commented and modification should be a breeze. The code should also work OK on FoxPro 2.6, although I haven't tested that."

Matt McQueen

[mmcqueen@netcomuk.co.uk](mailto:mmcqueen@netcomuk.co.uk)

\*Delighted to receive it, Matt. The file is on our cover-mounted CD-ROM as MATT.PRG

are so many B-something codes already, it was probably a good idea to go for something totally different. Other oddities are: Salisbury (SP), Ilford (IG), Wick (KW). I never did work these out (so much more interesting than Zip codes)."

### Components and sub-components

This one has come up before but it does bear repeating. I was asked a general question concerning how a relational database can hold information about objects which may be sub-components of other objects, but which may also contain further sub-components.

As an example, think in terms of a car: an engine is an object that is a component of the car and also itself contains components such as nuts, bolts, an oil pump and so on. Just to make life a little more complicated, a bolt may be a component of an engine as well as a component of an oil-pump which is, in turn, a component of an engine...

One solution is to use tables which reference themselves (see COMPNTS.MDB on our CD-ROM; also Fig 5). The SQL for the query shown is in Fig 6 (left).

### Formatting money

In April, Chris Aspden asked: "I have a Property Description Table holding, among other things, the asking price of the property, and this is a currency field. I have a Table called Offers which holds Phrases such as Offers Over, Offers Around. I wish to combine these fields in a form to produce a result such as 'Offers Over £45,000'."

John Knight provided a solution:

```
Offer Price;
[Offers] & " £" & Mid$(Str$([Asking
Price]),2,(Len(Str$([Asking
Price]))-4)) & "," &
Right(Str$([Asking Price]),3)."
```

But Wilf Davies has since come up with the something simpler: "Use the following Control Source in an unbound text box":

```
= [Offers] & " " & Format$([Asking
Price], "£0,000")"
```

## PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column.

Write to him at the usual PCW address (p10) or email him at [database@pcw.co.uk](mailto:database@pcw.co.uk)



# Postscript on partitions

After his tutorial on installing and partitioning large hard disks, Roger Gann needs to clarify a couple of things. Where can you get the FAT32 upgrade and which OS bears a heavy load?

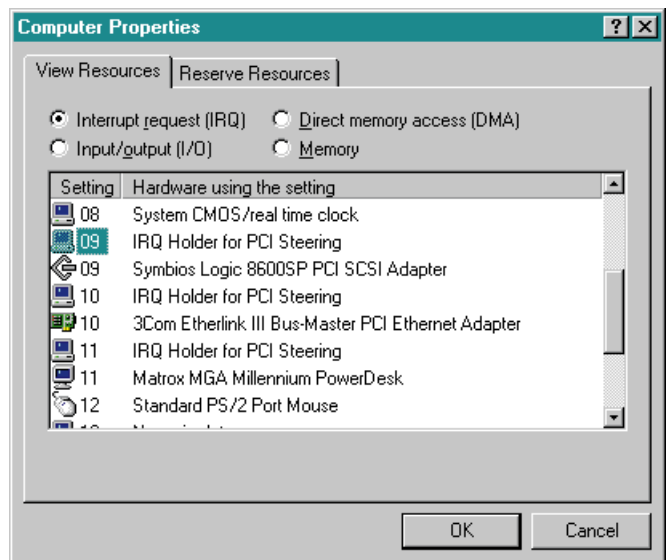
I've had a number of emails from readers raising a number of points about my past two columns on installing very large hard disks. One reader asked where you can get hold of the FAT32 upgrade, necessary if you want large, single-volume partitions. The answer is you can't, not by itself. It's only supplied on new PCs; the retail version of Windows 95 doesn't feature it.

Even if you can get hold of an OSR2 CD-ROM disc from a friend, it's not an "upgrade" version and so can't be installed over an existing Windows 95 installation: it's a blank disk or nothing! The weird thing is that most well-known PC manufacturers are now shipping PCs with hard disks larger than 2.1Gb and with the OSR2 version of Windows 95 pre-installed. And are these set up with FAT32 by default?

**Fig 1** PCI (or IRQ) steering in action [see "Steering committee"]

The short answer is, no, not generally. Most modern PCs ship with their drives carved up into 2.1Gb FAT16 partitions simply to ensure backwards compatibility with older versions of DOS. Now Windows 98

actually comes with a FAT16-to-FAT32 conversion utility which allows you to



convert on the fly, but existing Windows 95 users are denied this luxury. Yes, you could repartition the drive as FAT32, but with many PCs shipping with hundreds of megabytes of pre-installed software, this is a less than popular option.

Third-party solutions are available, however, like PowerQuest's PartitionMagic 3.0 and Quarterdeck's Partition-It, both of which allow conversion to and between FAT16 and FAT32 without zapping your data. Or you can wait until summer and upgrade to Windows 98.

How can you tell if you've already got OSR2? Right-click on My Computer and select Properties. If you're running OSR2, you'll see Microsoft Windows 95 4.00.950 B listed in the System area. To check which version of FAT you're running, right-click Drive C in Explorer and select Properties — the type is listed under the volume label window. Or fire up FDISK and choose option 4, Display Partition Information.

## Operating on a big scale

I don't think I made it too clear just which operating systems support very large (>8.4Gb) hard disks and those that don't. I summarise OS support as follows:

**DOS (all versions)** No version of this venerable operating system directly supports disks larger than 8.4Gb. If you want to fit something larger, you'll need to use a software-based translation solution such as Drive Manager.

**Windows 95** The original release of Windows 95 can support drives larger than 8.4Gb. However, it still uses the FAT16 file system and you'll need to create a minimum of five partitions in order to access the drive's entire capacity.

**Windows 95 OSR2/Windows 98** The same is true of the second maintenance release of Windows 95. Thanks to FAT32, partition sizes aren't limited to 2.1Gb.

**Windows NT 3.5** This version doesn't support drives larger than 8.4Gb...

**Windows NT 4.0** ... but this version does. However, the maximum partition size is 4.2Gb using either the NTFS or FAT file systems. The forthcoming Windows NT 5.0 will allow larger partition sizes.

**OS/2 Warp** OS/2's HPFS file system supports drives as large as 64Gb. If you find your partitions are restricted to 3.1 or 4.3Gb, download the latest ADD driver, IDEASD.EXE, from IBM's web site <[www.service.software.ibm.com](http://www.service.software.ibm.com)>.

**Novell NetWare 4.12** This release of NetWare can support drives larger than 8.4Gb. Older versions of the NOS can be upgraded to support larger drives — check out Novell's NetWare web site.

### A friend in need (of a clean installation)

A friend called to say that they were having trouble upgrading their Windows 3.1x installation to Windows 95. I asked the usual questions: "Have you enough memory/processing power/hard disk space?" Not only had the RAM been upped to 24Mb, but a second 2.1Gb hard disk had been added to supplement the meagre 420Mb drive that came as standard with their P60 Packard Bell multimedia PC. "What could be simpler?" I thought to myself. "Windows 95 usually installs well — can't imagine what the problem can be." So, to cut a long story short, I soon found myself staring at a recalcitrant Packard Bell PC that didn't want to be upgraded to Windows 95.

Despite its much-vaunted upgrading capabilities, bitter experience has taught me to install Windows 95 on to a clean disk, one uncontaminated by a previous installation. After having taken the precaution of copying the contents of the 420Mb Drive C to the 2.1Gb Drive D, I then rebooted from a system floppy with a generic IDE CD-ROM driver. My intention was to zap Drive C, copy the Windows 95 install CAB files over to the hard disk from the CD-ROM, and run the Setup program from there. Not only did I not "see" the CD-ROM drive once I'd booted, but I couldn't "see" either of the two hard disks either.

The invisible CD-ROM was easy to solve — I whipped the lid to see that the drive was hooked up to the Panasonic interface on the sound card. Bang goes that idea. But what about the absentee hard drives?

### Chain of thought

A well-known chain of computer super-store had carried the actual hardware upgrade. The Packard Bell's BIOS was old (it was a P60) and so suffered from the 504Mb IDE "ceiling"; in order to get the 2.1Gb drive working they'd installed the translation software.

And sure enough, it worked. Except that when you booted from a system floppy, unless you pressed a key at the right moment, the translation software wouldn't load and the patched hard disks wouldn't be visible to an ordinary DOS disk. And because they'd slaved the newer disk to the older one, it meant that I had no choice but to boot from the first drive.

This was the drive I intended to zap, don't forget, and if I zapped the first drive, it would mean Goodnight Vienna for the

second drive as well, the one with all the unbacked-up data on it. But I needed a clean hard disk to install Windows 95 to ensure no more upgrade glitches. Worse still, I had no DOS drivers for that blasted proprietary CD-ROM interface! Catch 22 had nothing on this as far as I could see.

In the end I had to jump through the hoop to get Windows 95 installed. I copied the Windows 95 folder on to an old 500Mb IDE drive and temporarily swapped it for the new 2.1Gb drive. Once booted, I was able to copy the folder over to Drive C and then hook the new drive back up — I ignored the CD-ROM entirely for the purposes of installing Windows 95.

### On the cards

I came across an alarming discovery the other day.

Another friend was having trouble installing a network card in his brand new Gateway G6-233 PC. I'd told him to make sure he

bought a plug-and-play PCI network interface card. But that damn card refused to install properly: Device Manager rewarded our efforts with a yellow exclamation mark, obligingly warning us that the device was either "not present, not working properly or didn't have all the device drivers installed".

After talking through it over the phone, I was none the wiser. Why had plug and play failed to work on such a state-of-the-art PC? I told him to bring it over so that I could take a close look at it. And when I checked the hardware resources in Device Manager to see which IRQs were free, I was startled to find that all 16 IRQs had been taken by hardware devices — there were no free IRQs whatsoever.

Normally a PC will have perhaps five free IRQs, but not this particular Gateway PC. It had a very large 6Gb EIDE drive and a special Promise card was fitted to support it: that took one IRQ, while another three were taken by the integrated Ensoniq sound hardware, which seemed a little excessive. And that was that — not a single free IRQ was left for any expansion cards you might want to fit in the future.

### Steering committee

But this IRQ drought shouldn't have been a problem because, thanks to a little-known miracle known as PCI steering, multiple hardware devices can now share a single IRQ. Check out Fig 1. You'll see that an IRQ holder had first go on IRQs 9,10 and 11 and then doled them out to the SCSI, network and graphics card. This is PCI steering in action.

PCI or IRQ steering is the ability to intercept requests issued for an IRQ and route them to the next available IRQ. Support for PCI steering only surfaced with the OEM Service Release 2 of Windows 95.

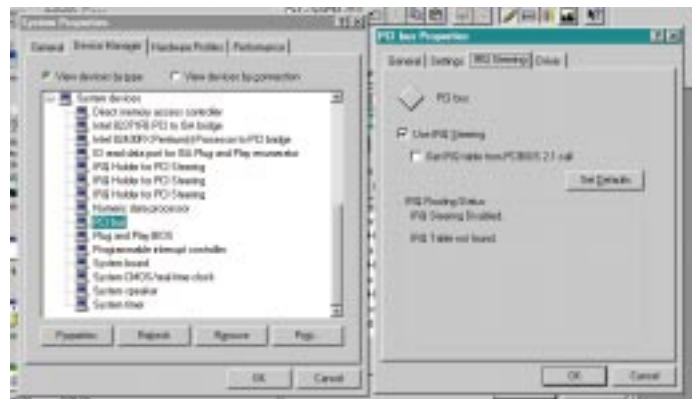


Fig 2 Check it out: the IRQ Steering check box being activated

It is most useful on portable computers with docking stations on which the hardware state frequently changes. By default it isn't enabled in Windows 95 OSR2, and for this reason a PCI device may display "Error Code 29" for its status when viewed in the Device Manager.

To turn on IRQ steering, click on the System applet in Control Panel, click Device Manager, expand the System Devices branch, click PCI Bus, click Properties, click IRQ Steering and turn on the IRQ Steering check box (Fig 2). Information on PCI steering seems to be sparse, but as far I can tell it only applies to IRQs 8 to 15.

But for this new technology, did PCI Steering help me? Of course not. After a lot of head scratching the only 'solution' was to disable the legacy sound hardware support with the Ensoniq. This freed up an IRQ and the network card then worked as it should.

### PCW Contact

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# Channel hopping

How to cut a fine tune by paying attention to MIDI and audio patterns, and how to beat a path to some cool rhythms with Stomper and Hammerhead. With Ian Waugh and Steven Helstrip.

In this month's column we continue our VST masterclass and take a look at two of the coolest sound utilities of the moment which, when used together, promise to make you and your PC groove. Before we get stuck in, though, note that VST has been updated to version 3.55.

The main focus in this release is the addition of four inserts on each audio channel which, in theory at least, is cable of providing up to 32 x 4 additional effects and opens up the possibility of using plug-in compressors and third-party EQs. Support for ReCycle files has also been implemented and the Audio Engine can now be disabled at launch by holding down Shift. 3.55 is available for download from [www.steinberg.net](http://www.steinberg.net).

## Pattern cutting with VST

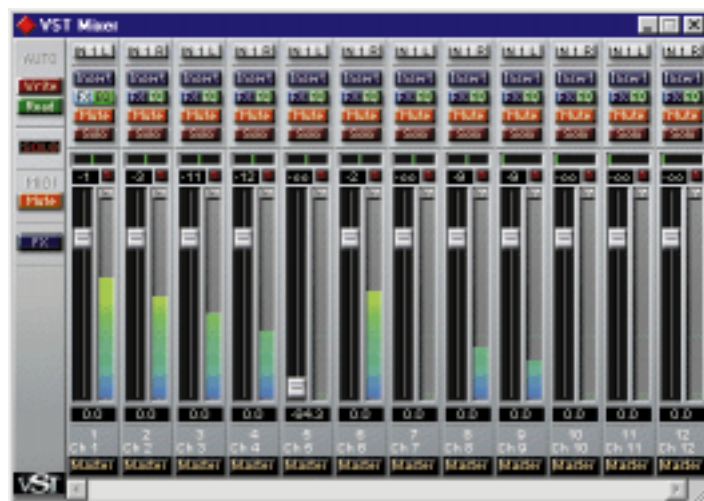
MIDI and audio patterns can be treated in similar ways in VST, including cutting and copying around the arrange window. With audio, the main thing to remember is the difference between audio tracks and audio channels. VST can handle up to 32 audio channels, providing you have the hardware to play back that number, but you can use any number of audio tracks in an arrangement.

Set the number of audio channels you want to use in the Audio/System menu (see *PCW, May*). Click in the Chn column of an audio track to set that track to playback on a specific audio channel. If you have selected 12 audio channels, for example, the Chn pop-up menu will list channels 1 to 12.

Stereo parts use two audio channels and must be placed on an odd-numbered channel such as 1, 3 or 5. The Chn pop-up box will then list channels in pairs such as



**Above** The loop in the timeline is set from bars 2 to 8, while at the current tempo, the sample runs to just over half-way through bar seven



**Left** The Monitor mixer window is where you mix the audio channels

1+2, 3+4 and 5+6. If a track can be set to stereo, the "stereo" button in the inspector will be lit and clicking on it will toggle it between "mono" and "stereo". You can't do this if it already contains a mono recording.

You can set a track to "any" audio channel, which allows you to handle all audio channels from one track. You may want to do this if you have a system that can record on several channels at the same time. You can also set more than one track

to the same audio channel, but if two parts overlap, the latest recording — the one furthest to the right in the arrangement — will "steal" the audio channel.

## Time, please

One way to go about writing a song is to use pre-recorded digital audio drum and bass loops to create a backing, and add other samples and MIDI parts on top. To keep time you'll want to match Cubase's



Two of the four EQ modules available for each audio channel

Inspector, to open the Channel Settings or FX and EQ window. You can use up to four parametric EQs per channel. Click on the

tempo to the audio recording. To do this, import the file into the Audio Pool and drag it to a track so it starts at a sensible musical position. If the loop begins on a down beat, then the start of a bar is good.

Double-click on it to open the Audio Editor (note: this is not the same as the Edit Audio option in the Audio menu which is used to edit Wave files). Drag a loop in the timeline along the top of the editor for the number of bars you want the loop to play. This will be a little longer or shorter than the sample. Select the audio event (Ctrl+A) and select Fit Event to Loop Range from the Do menu. Click on Tempo and the deed is done. If the Master button is active, the new tempo is entered in the Mastertrack list.

### With a song in your heart

Start a song with a tempo which fits the sample loops you're using and add MIDI parts to it. It's easier than adjusting audio to fit a tempo later on, although you can do this by selecting Audio instead of Tempo in the above example.

The Monitor (selected from the Audio menu) is a mixer which shows the audio channels with faders, pan control, solo and mute, FX/EQ and the new Insert buttons. You can adjust settings in real-time as the music plays.

No mix is complete without a dash of EQ. Click on the FX/EQ button in the Monitor, or on the FX/EQ button in the

arrows near the top right of the EQ window to hide and reveal the EQ modules.

Use the four Preset buttons to select a frequency range quickly. You can fine-tune the range with the Hi and Lo Limit controls. The four Q presets and the Q control determine the width of the frequency affected by the EQ: the higher the value, the narrower the frequency band. Use a narrow band to home in on a frequency and a wide band to affect a broader tonal area such as the bass or the mid range.

The Frequency control sets the centre frequency (which will be inbetween the Hi and Lo Limits), and the Gain control cuts or boosts the frequencies in this area.

### EQ Tips

As a general rule, cut rather than boost. To EQ a bass guitar, use 2-4kHz for its mid range and 80-120Hz for the lower end. To make a section stand out, boost the 1-5kHz range.

### Hammerhead Rhythm Station

If you're looking to get your hands on a full-blown drum machine, then have a bash on Hammerhead. It's equipped with some of the finest drum sounds from classic rhythm boxes, including the TR-909, and you can assign your own samples to any of its six audio channels. It works with loops and,

p280 >



**Above** Groove along with Hammerhead to create drum and percussion loops up to four bars long

**Right** Get stompin' to create lush and fat analogue-like drum and synth sounds

unlike Rebirth, it's got distortion on every channel. It's also a breeze to program using the familiar 909 layout. What's best about Hammerhead, though, is that it's free.

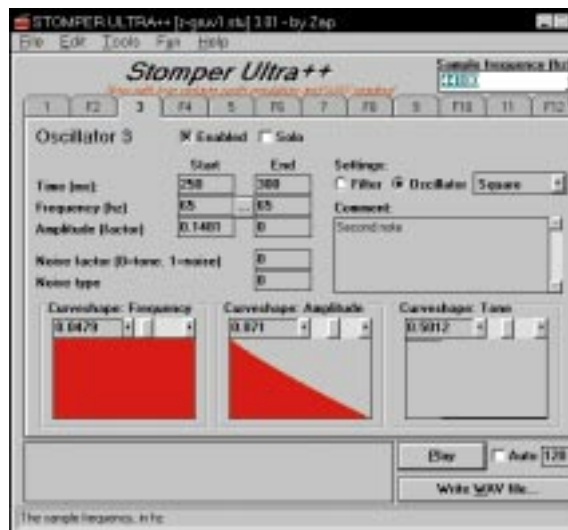
To get you started there are 29 drum patches to play with, of which six are loops that will auto-tune to match the tempo of your pattern. Samples are quickly assigned to channels using a drop-down menu system and instruments can be reversed. To make your custom-built loops groove along with swing, Hammerhead has a slider to apply shuffle and the results can be heard in real-time.

Patterns can be up to eight bars in duration, although you work with one-bar loops at a time. When you've got something to try in a track, the file can be streamed to disc as a Wave file. There is currently no sync facility.

Hammerhead works with any sound card and provides a separate utility to make user sample banks. Up to six samples can be grouped, providing they are no larger than 256Kb and supplied in raw format. Lucky, then, that we also have a drum synthesiser capable of providing just that. If you check the "stretch to measure" field, loops will auto-tune to the tempo of the track. Try firing-up some bass riffs or vocal samples, too.

### Stomper Ultra

Stomper uses software synthesis to produce analogue drum-like sounds. Similar



to Virtual Waves, reviewed in *PCW* March, Stomper is able to generate basic waveforms and route them through resonant filters before shaping the overall sound with an envelope to simulate, say, an 808 snare.

Stomper doesn't just do drum sounds, though. It's quite possible to squeeze a

### Stomper snare

Vintage drum machines often used simple analog schematics to do their synthesis of a drum sound, implementing a ring circuit to produce a pure sine-tone with diminishing amplitude. If you add to this a touch of distortion and play around with the pitch, a wide range of percussion-like sounds can be created. When you combine a low-pitched thud with a high-pitched click, you get something along the lines of a 909 Kick. Add to this a splash of noise, pitched somewhere in-between, and you achieve something that resembles a snare.

respectable bass sound out of it, and for zaps and analog effects it's almost as fun and versatile as a modular synth.

Stomper can generate up to 256 oscillators and filters that can be mixed together to produce one seriously huge sound. Alternatively, oscillators can be offset to create rhythmic patterns or wave sequences. Preset waves include sine, square, sawtooth and triangle. Wave files can also be implemented and have access to the same parameters that are available for preset waves. These include start and end points for frequency (pitch) and amplitude (level). Curve shapes are available for both, and each oscillator provides a noise generator with selectable bandwidth and

noise type. Tone Curve shape enables you to apply a distortion-like effect to toughen up the sound and help it stand out in a mix.

Stomper provides a useful musical frequency calculator, so if you're looking to generate a kick tuned to, say, D1, Stomper comes up with the frequency in hertz (Hz) and can copy the values to both the frequency start and end parameters. This enables you to come up with accurate glissandos so that a bass note, for example, can start on C1 and slide up to C2 for those 303-like

portamento moments.

Over 30 instruments and drum sounds are provided, which conveniently double up as templates or starting points for creating your own synths. And for when you need a break, there's a built-in game of Tetris.

Stomper is musicware, which means it won't cost you anything. However, if you create a piece of music that uses a sound from Stomper, you are kindly asked to send a copy of it to the author.

● *Hammerhead and Stomper are included on this month's cover CD.*

### PCW Contacts

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Further updates and info from [inside.hku.nl/~bram/hammer/index.htm](http://inside.hku.nl/~bram/hammer/index.htm) and [stomper.base.org](http://stomper.base.org)





# The magnificent **seven**

Ken McMahon shows how to create a seven-frame animated gif for viewing on the web: it's easy to do, and you don't need expensive, big-time applications to achieve your effects.

**L**et's expand our horizons with a look at web graphics. Until now, I've concentrated on on-the-page stuff, but it's time to be more adventurous. So it's straight in at the deep end and "how to create web animations". If you're acquainted with Photoshop, Paint Shop Pro or even MS Paint, this won't be too taxing.

We're going to create a seven-frame animated gif. These are the simplest and yet the best kind of animation you can create for web viewing because virtually every browser ever invented supports animated gifs, so your audience won't be left in the dark for want of a plug-in.

## Layers

A paint application which has layers is a big timesaver, so I'm using Photoshop 3.0. The procedure is simply to draw each frame of your animation in successive layers. My effort consists of a carefully-drawn TV which displays a succession of still photos. I've drawn the TV in the background layer, selected the screen area using the magic wand, and pasted my images into the selection on successive layers.

The next stage is to save each individual frame with the relevant layers visible: in this case the background telly layer, plus one of the image layers. The two interference layers were created by applying gaussian

noise to the selection. I used two different noise frames so as to create the illusion of moving interference, and you can lengthen the interference bit of the animation simply by inserting more frames.

## Around the weld

Now you need to pull all the frame files into an application that can weld them together. I'm using Equilibrium Debabelizer, which also has the best colour optimisation and batch processing capabilities of any application I'm aware of. There are plenty of standalone shareware applications that will do this for you and some of the better image-editing suites allow you to create, edit and save animated gifs. (See "PCW Contacts", p284, for more information.)

Debabelizer works with batchlists, a collection of files to which you can apply an editing process, or sequence of processes, in the form of a script. To create an animation you must first pull all the files into a batchlist. You can do this by dragging and dropping files from Explorer, or by right-clicking on the batchlist window and selecting add files from the pop-up. The order that the files appear in the batchlist is the order in which they will appear in the animation, so you can move them around, add them more than once, or whatever, until you're satisfied with the arrangement.

Next, you need to create a Superpalette. All the images are currently 24-bit RGB. Gif format is an 8-bit indexed format so the >



**Right** Easy to make. Nearly every browser available supports animated gifs

**Below** A simple, seven-line animated gif





Pull your frame files together using an application such as Debabelizer

## Question & Answer — Colour separation

**Q** I am a software developer. I am currently using Visual dBase Professional and Borland C++ Builder. I have a small business centre which complements my development, and I would like to expand it to produce high-quality colour-separation work. In this part of the world (Nigeria) we don't have imagesetter labs, so you have to set everything yourself to achieve the separation. Presently, we do the separation as follows:

1. Scan the picture with a Hewlett-Packard IICx or 4C scanner.
2. Save it as BMP image.
3. Open CorelDraw, import the image, separate it into CMYK colours and print on a Xerox transparency. (We use HP LaserJet 4 printers.)
4. The client takes the transparency, makes the plates, and prints using a conventional printing press.

It works, but the quality of printing is poor. Possibly the 600dpi scanner is not adequate for the task of producing A4 colour output? I would appreciate advice on the type of scanner, printer and computer configuration (monitor resolution, VGA etc) I would need to produce good-quality colour separations for printing.

Adamu A Sufi

**A** The weak link in your colour production chain is the HP LaserJet printer. Ordinarily, film separations for commercial colour printing would be produced on an imagesetter with a much higher resolution: 2,400dpi or more by comparison with the LaserJet's 600dpi. There are some higher-resolution 1,200dpi laser printers on the market and you might achieve better results with one of these, but the only way to get good-quality results is to send your files to a bureau where they can be properly output.

If that really is an impossibility, then you can at least maximise the quality of your existing setup by using appropriate image and screen resolutions for your pictures. Your HP scanner is easily good enough to produce reproduction-quality images at A4 size, providing the originals are not too small. Aim for a resolution of 200dpi at the finished size. When you print your separations, use a halftone screen resolution between 60 and 90lpi (try running out a sample at different screen settings to see which works best).

Flip the image so it prints back to front — in printing parlance this is called "right reading emulsion down" (RRED). When the film is laid on the plate to contact print, this method produces the sharpest results as the image is in direct contact with the plate. If you print the "right" way around, the thickness of the film between the image and the plate causes a slight blurring of the image.

Finally, you'll get a marginal improvement in quality by printing on coated paper which reduces the spread of the inks during the printing process.

## PC output bureaux

Our search for PC PostScript bureaux has received a ballistic boost courtesy of Neera Panchmatia, Corel's UK and Ireland Communications Manager. Corel has compiled a list of UK bureaux and you can find it at [www.corel.com/international/uk\\_ireland/service\\_bureaus\\_uk.htm](http://www.corel.com/international/uk_ireland/service_bureaus_uk.htm). Here it is:

Company	City	Telephone
ABC Windows Bureau	London	0171 278 5004
Alchemy Graphics	Reading	0118 976 0077
Apollo Colour Repro	W. Molesey, Surrey	0181 733 0060
Aztec Presentations	Leeds	0113 242 7733
Blades Group Services	London	0171 631 0777
CCL Leicester	Leicester	0533 460054
Clicks Computer Graphics	London	0171 278 2300
Colour Bytes	London	0171 580 4271
Creation Station	Guildford	01483 458585
Data Graphic Services	Knowsley, Mersey.	0151 449 0009
Digital Bliss	Weymouth	01305 770240
Disk To Print	London	0171 625 5225
DPT Covent Garden	London	0171 240 8301
Dunholm Publicity	Ashton-under-Lyne	0161 339 9099
Eidographics	London	08174 99091
EuroExpo Display	Huntingdon	01480 433544
Euroimage Management	Crawley	01293 538539
Fastsigns	London	0181 566 1992
Fastsigns (Leeds)	Leeds	0113 246 9300
FastSigns (Nottingham)	Newark	01636 76982
FastSigns (Sheffield)	Sheffield	0114 287 3044
Fastsigns (Sheffield)	Sheffield	0114 266 1200
Graphico Presentations	Newbury	01635 522810
GraphiService London	London	0171 467 2700
Independent Output	London	0171 580 4315
Inform Graphics	Oxford	01865 727239
Jupiter Associates	Croydon	0181 688 6133
Legend DTP	Great Moor, Stockp't	0161 419 9748
Mark Carroll & Company	Kingston-on-Thames	0181 546 9606
Mass Mitec	Market Harborough	01858 410366
Oakdale Colour Copy Bureau	Lane End, Bucks.	01494 882674
Pacesetters	Bristol	0117 963 7507
PC Bureau Services	Tolworth	0181 339 9441
PC-PressData	London	0171 439 1260
Pia	Cardiff	01222 222696
Planet Presentations	Maidenhead	01628 778444
Planet Presentations	Manchester	0161 228 3393
Planet Presentations	Hall Green, Birm'hm	0121 778 4077
Planet Presentations	London	0171 836 5510
Presentation Express	Guildford	01483 455554
RedLeaf Limited	Teddington	0181 943 1526
Reflections	High Wycombe	01494 883250
Slideshow	London	0171 7964664
Spingold Pres. Graphics	Colchester	01206 262751
Technoprint plc	Leeds	0113 253 3920
The Slide Studio	Sevenoaks	01732 455955
The Image Projections	Horsham	01403 211110
The Printing Company	High Barnet	0181 441 4688
The Right Image	Oxford	01865 384156
Typestream	Bournemouth	01202 315151
WACE Corporate Imaging	Birmingham	0121 212 4646
Woodstock Typesetters	Thatcham	01635 522892
Wordsworth DTP Services	Cheltenham	01242 236682

colour depth of each of the frames in the animation needs to be reduced. In creating a superpalette, Debabelizer analyses each of the frames and comes up with a palette that gives the best visual result for all images. When you create the Superpalette you can specify a browser palette, like the Netscape palette which uses 216 colours, as a base.

### Creating the animation

Now it's time to create the animation using the create animation/video option from the batch menu. In the dialog box, specify gif as the file type and set the writer preference options for any specific transparency, frame timing and compression options you want. Debabelizer gives you options in the event of all your frames not being the same size, but we don't need to worry about that: it's another advantage of creating all your frames from the same image using different layers.

When the animation has been created it is displayed in a viewing window with play controls. Now is the time to apply the Superpalette created earlier by dragging the action arrow at the top right of the superpalette window onto the animation. This maps all the pixels in each frame of the animation to one of the 256 colours within the indexed superpalette. Then save

your animation and get it onto an HTML page to test it in your browser.

Once you've seen it run, you might want to go back and make a few modifications. Adherence to a few design rules will, however, make your initial efforts more likely to succeed. The main drawback with animation on the web or, come to that, most things on the web, is that much of what goes on is out of your control. The speed with which your animation plays, for example, is as likely to be determined by the connection bandwidth and demand on the server as anything else.

So, rather than attempting super-smooth 15-frames-per-minute video quality, stick with simple stuff. Two-frame animations on a loop can look good, and can actually improve if the timing goes slightly askew because of a clunky connection. If you do decide to loop (your animation starts again at the beginning and goes round and round), be careful in your choice of subject. In the attention-grabbing stakes, flashing primary-colour backgrounds might rate alongside flashing a torch in someone's eyes, being more likely to intensely irritate than attract.

As mentioned at the beginning, you don't need much to put together animations. If you haven't got nearly £400 to spend on Debabelizer, there are plenty of other applications which will assemble a bunch of frame images into gif89a format: CorelMove v7 and later, CorelXara v1.2, MacroMedia Director, Micrographx 3D FX and Web 3D can all do it. Microsoft's Frontpage 98 includes Image Composer 1.5, which includes Microsoft gif animator.

Two shareware options are Alchemy's Gif Construction Set and Animagic's Gif Animator. Both can be downloaded from the web and the respective registration fees are \$20 and \$29. If you drive a Mac, you need a copy of the excellent Gifbuilder.

## PCW Contacts

Ken McMahon can be contacted by post c/o PCW at the usual address (p10) or via email at [graphics@pcw.co.uk](mailto:graphics@pcw.co.uk)

Animagic gif animator [rtisoft.com/animagic](http://rtisoft.com/animagic)  
 CorelMove and CorelXara [www.corel.com](http://www.corel.com)  
 Debabelizer [www.equilibrium.com](http://www.equilibrium.com)  
 Gifbuilder [www.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html](http://www.epfl.ch/Staff/Yves.Piguet/clip2gif-home/GifBuilder.html)  
 Gif Construction Set [www.mindworkshop.com/alchemy/alchemy.html](http://www.mindworkshop.com/alchemy/alchemy.html) or [ftp.mindworkshop.com](http://ftp.mindworkshop.com) in the directory [/pub/alchemy](http://pub/alchemy)  
 Microsoft Gif Animator [www.microsoft.com/imagecomposer/gifanimator](http://www.microsoft.com/imagecomposer/gifanimator)





# Game on

You've heard of BritPop: how about BritSoft? British games designers are excelling in their field. Benjamin Woolley presents games programming and design for the PC and the PlayStation.

**I**f you are a 3D graphics enthusiast who wants to use their skills in designing content for games, how do you go about it? What technical skills do you need?

First the bad news — and it is pretty bad. If you want to try out a little game designing for yourself, you will need more than a good knowledge of a 3D package and a sharp eye for shapely geometry. You will need programming skills. In fact, it is worse than that: it helps to be a real hacker, a fiend at coding C or even, God forbid, Assembler. This is because the games “engine”, the bit which enables the user to interact with the content you design, must be tightly designed to get maximum performance out of the hardware. There are apparently high-level tools to ease the pain, but they are all in the hands of the development houses and are tightly guarded, as they can give one

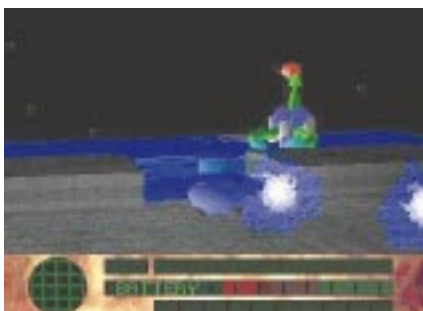
company a competitive edge over another. However, a number of recent developments enable you to at least dabble with a bit of game design and thereby get an appreciation of what is involved.

Here I'll explore two paths cheap enough to be accessible to the determined enthusiast. One is DirectX, Microsoft's multimedia API specifically developed to encourage games programming in the

Windows 95 environment. The other is Sony's NetYaroze, a home-brew-style game development system aimed at getting people to develop content for the PlayStation.

## Taking Direct action

One of the big advantages of DirectX is that, if you have a Windows 95 PC, it comes free — if you exclude the cost of downloading the huge software development kit.



**Fig 1** [from the top, left to right] Sequence from Z2, a game being worked on by Andrew Webb (3D graphics) and Jim Pitts (game engine) for the PlayStation using NetYaroze. Thanks to both for the time they took to generate these screenshots

Theoretically, you could use the SDK together with a freeware or shareware C compiler and start coding. However, to be practical, you will probably need to invest in some program tools such as Visual C++. Microsoft, desperate to promote Windows as a powerful entertainment platform, has a whole web site dedicated to DirectX <[www.microsoft.com/directx](http://www.microsoft.com/directx)> where you can download the resources you need. There are also various tutorials available online which outline the rough basics.

### Now C hear!

To program in DirectX you need a good knowledge of C — a common denominator of most games programming these days, which you will probably have to acquire from a book. The SDK comes with a huge helpfile which lists all the libraries and objects (the commands and variables used in the programs) that make up the DirectX API, and explains how to use them. You also get a huge set of source code examples showing how various objects are used.

Direct3D, the 3D component of DirectX, deals with 3D graphics in two ways: the immediate and retained modes. Retained mode is the one novices will most likely use, as it provides a relatively small number of powerful programming objects to play with. Immediate mode offers low-level objects aimed at expert graphics programmers.

The architecture of Direct3D is quite complex, but a prolonged study of the SDK helpfile starts to reveal some of its fundamentals. There is a step-by-step tutorial which takes you through the process of displaying a textured globe in a window. There is also a utility for converting 3D Studio-format files into the native format for DirectX mesh and texture files.

### Work and Play

If you are more interested in seeing your work on a game console rather than confined to the PC, perhaps the best bet is to invest in Sony's NetYaroze. This is a special PlayStation (its matt black bodywork denotes the way it stands apart) that you can program with a PC. At the time of writing, it was available on special offer at around £350 (ex VAT), which may not sound cheap compared to the price of a standard PlayStation, but certainly is compared to the price of a professional development system, which runs into the thousands. For the extra, you get all the cables, cards, CDs and documentation you



**Fig 2** A model being worked on by Dutchman Dennis Brinkhuis for a game being developed on the NetYaroze. You can see more of Dennis's work on his web site <[www.a1.nl/macsupport/debri](http://www.a1.nl/macsupport/debri)>

need to plug it into your PC, and you also get access to the private NetYaroze web site, itself a precious benefit.

Connecting the system up is relatively simple: you plug in the serial cable and run a batch program on the PC which sets up the connection speed and various other environment variables. Programming the system is a bit like using DirectX. You convert your 3D models to the PlayStation's TMD format (the SDK comes with a DXF-to-TMD converter), you write the program that will display and manipulate them on the PlayStation using C, incorporating the commands or objects that make up the proprietary PlayStation API. You then compile your program (the software development kit comes with the GNU freeware C compiler) and invoke a comms program that squirts the executable down the cable to the PlayStation. You can then run the program on the console and view the results on the TV/monitor to which the console is connected.

As with DirectX, you have to spend some time acquainting yourself with the PlayStation (or "PSX", as it is known) API. I found it more complex than that of DirectX, and not as well documented. By way of compensation, you do have access to the

NetYaroze web site, which is wonderful. It is open to NetYaroze owners only, and provides you with space for your own web page where you are encouraged to put up examples of your work.

There is a genuinely useful library of samples, source code, utilities and tools provided by your fellow NetYarozeans, and a general air of co-operation among the very mixed membership, which includes both novices and experts. Many of the members' home pages contain inspiring screenshots which show what the NetYaroze can do. There is also a range of newsgroups, and a facility that encourages members to team up to form "programming groups" with their own directory space for sharing code.

### A site for sore eyes

Sony has put a lot of work into NetYaroze since its launch, and I can imagine no better way for a 3D graphics artist to extend his or her skills into the world of console games. However, I do think for the price you could have been given a more generous set of programming tools. I don't think bundling the GNU compiler is quite in the spirit of the freeware movement; a proper development environment would have been more appropriate. Nevertheless, the web site is a huge plus, an object lesson in the power of the internet as a collaborative tool.

### First stop, the web

DirectX and NetYaroze will both demand a lot of time as well as a bit of money. As a preliminary, I would advise first browsing one of the developer web sites just to see what is involved. Perhaps look at a tutorial, or examine some example source files. The best site I could find at the time of writing was the Game Programming Megasite at [www.perplexed.com/GPMega/index.htm](http://www.perplexed.com/GPMega/index.htm). There is a UK site, the Games Development Site, at [www.games.ndirect.co.uk/](http://www.games.ndirect.co.uk/), but it was still in the early stages of development when I looked at it.

● *Next month I will look at employment prospects for budding 3D artists who want to become part of the Britsoft thing, and at how to create meshes and models that will work in a 3D game.*

### PCW Contact

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# Wicked Widgets

Tim Anderson gives an overview of the new features in Sheridan's latest version of Data Widgets, and newcomers to VB should see his Beginners' Corner for bitwise operations.

**I**n the early days of Visual Basic, Widgets was the must-have add-on. That was when the native VB grid control was not data-aware. Things are different now, and VB 5.0 comes with several competent grid controls and a much-improved range of data-aware components.

There is still scope for third-party components, though, and Data Widgets provides far richer functionality for those who want to construct a rich database front-end without much programming. The new version 3.0 adds enhanced printing and HTML export features.

## Six of the best

Data Widgets is a set of six 16- or 32-bit OCX controls. The Data Grid is at the heart of the package and provides virtual data management, which means you can browse very large tables without problems. There are also drop-down controls in grid cells, the ability to specify groups — each with their own colour and font — and an advanced design-time grid editor.

The Data Combo is a bound combo box which also serves as a masked edit control. You can bind fields to option buttons using the Data Option Set, and there is an enhanced data control which serves as a front-end to the standard VB data control. It has built-in conditional and soundex searching, built-in bookmarks, and buttons for Add, Delete and Update.

## What widgets are new?

An ssPrintInfo object, combined with new Data Grid features, lets you use a Data Grid as an instant report writer. You can include headers, footers and grouping in the printed output.

There is the ability to save a grid layout at runtime, so if a user has customised extensively by resizing or moving columns, this can easily be saved for future use.

Sheridan has worked hard on HTML export features. The Data Grid's Export method has a range of parameters

including an HTML template filename.

A system of replaceable tokens lets you create highly customised HTML pages which can be filled with the Data Grid's current data set. This is not true dynamic database access, but a means of updating and generating an up-to-date set of static

Product Summary (Overall Avg. = 3.73)							
Product	Functionality	Usability	Reliability	Performance	Docs	Samples/FAQs	Avg. (1-5)
Product A	4.5	4.3	4.3	4.4	3.9	3.8	4.2
Product B	4.5	4.4	3.9	3.9	3.6	3.6	4
Product C	4.2	4.3	4	4.1	3.8	3.8	4
Product D	4.2	4	3.9	4.1	3.7	3.5	3.9
Product E	3.7	3.4	3	3.5	3.2	3.1	3.3
Product F	4.1	3.8	3.4	3.6	3.3	3.3	3.6
Product G	3.9	3.9	3.3	3.6	3.5	3.5	3.5
Product H	3.6	3.6	3.2	3.4	3.2	3.2	3.4
Product I	4.4	4.3	3.8	3.8	3.8	3.5	3.9
Product J	3.5	3.3	2.7	2.5	3.5	3.4	3.2
Product K	4.4	4.3	3.6	3.8	3.7	3.4	3.9
Product L	4	3.9	3.6	3.6	3	3.1	3.5

Services Summary (Overall Avg. = 3.83)		
Service	Question	Avg. (1-5)
Technical Support Services	Support Via Telephone	3.6
Technical Support Services	Support Via E-Mail	3.5
Sales Services	Prior Sales Information	3.8
Sales Services	Order Placement	3.8
Sales Services	Order Fulfillment	3.8
Sales Services	Post Sales Customer Service	3.4
Web Services	Product Information	4.2
Web Services	Product Patches/Support Info	4.2
Web Services	Pricing/Ordering Info	3.9
Web Services	Company Info/News	3.9

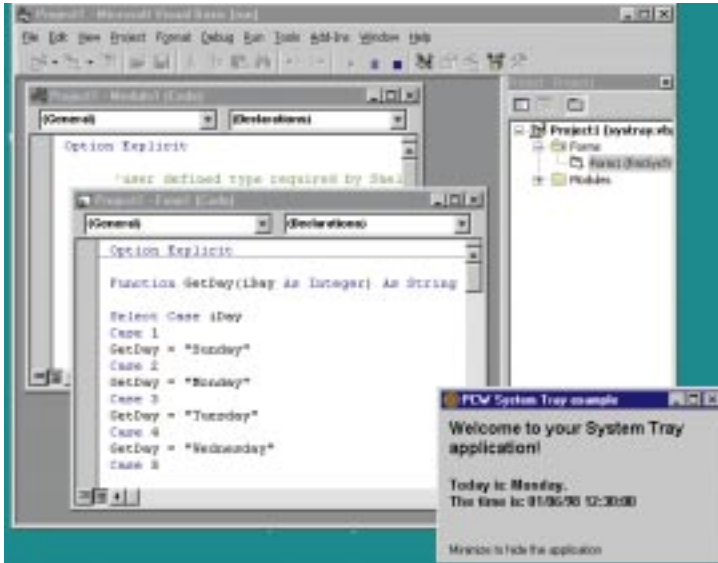
**Above** This Data Widgets application is unusual in that it does not use a data control.

The data is loaded from a text file at runtime. Layout features like the wider rows in the upper table are preserved between sessions

**Right** Data Widgets made this table from the current data in a data grid. It created a set of three tables, using HTML templates, with an index page for viewing them

Product Summary (Overall Avg. = 3.73)							
Product	Functionality	Usability	Reliability	Performance	Docs	Samples/FAQs	Avg. (1-5)
Product A	4.5	4.3	4.3	4.4	3.9	3.8	4.2
Product B	4.5	4.4	3.9	3.9	3.6	3.6	4
Product C	4.2	4.3	4	4.1	3.8	3.8	4
Product D	4.2	4	3.9	4.1	3.7	3.5	3.9
Product E	3.7	3.4	3	3.5	3.2	3.1	3.3
Product F	4.1	3.8	3.4	3.6	3.3	3.3	3.6





**Fig 1** With a bit of hackery, you can use VB to write System Tray applications

pointer to a NOTIFYICONDATA structure which identifies the application. Fig 2 shows the VB declaration.

message, the IParam parameter (the one in which we are interested) would contain the x and y position of the mouse. The x position would be in the lParam of IParam, so the X parameter of VB's MouseEventArgs is where we find the identifier for the taskbar mouse event that has occurred.

VB may have adjusted this parameter if the form's ScaleMode is not set to vbPixels, so you need to allow for that in your code. Perhaps it would have been easier to use AddressOf after all! Once you have safely intercepted the message, you can write code to respond accordingly. The example in Fig 4 (p293) uses the SetForegroundWindow API function.

### Summing up

In summary, here is how to write a VB system tray application:

1. Declare the NOTIFYICONDATA type, the Shell\_NotifyIcon API function, and the constants it uses.
2. When your application runs, show the form, fill a NOTIFYICONDATA variable with

HTML pages. Unfortunately the templates are complex to set up, although several examples are supplied.

### A sophisticated front-end

If you want to create sophisticated database front-ends quickly and with a minimum of code, Data Widgets is the answer. As you would expect, the controls are large; frustratingly so if you require only a small subset of the total feature set. These are heavyweight controls which make sense only if you are able to build an entire application around them.

The new reporting features are impressive but no threat to Crystal Reports or the Access 97 report writer. With such a complex product it is a letdown to find no printed manual in the box, and it's a shame that Sheridan has not heard of Delphi. How about a VCL version sometime?

### Visual Basic and Systray applications

Doug, a reader, asks: "How do I use a system tray icon so that when I click it, it performs an action (e.g. makes form1 enabled) or creates a popup menu?"

System tray applications are those handy little utilities that park themselves as an icon on the end of the taskbar. Creating them in VB isn't difficult, but it does involve a bit of hackery (Fig 1). There isn't enough room to print all the code here, but an example is included on our cover CD. Further information can be found on the Microsoft Developer Network library CD.

Icons are installed on the system by using the API call Shell\_NotifyIcon. This function takes two parameters: a long value which instructs the Shell to add, delete or modify an icon in the system tray, and a

The key part of this user-defined type is that it provides the shell with a message that will be sent whenever a mouse event occurs over the relevant taskbar icon. The message sent by the shell has an lParam parameter identifying the mouse event, and a wParam parameter identifying the icon which received the event. For a simple application, the first of these is all you need to worry about.

The tidiest way to do this is by defining your own message constant and subclassing the VB application to trap the message. This involves the AddressOf operator and is a little tricky, so you may prefer to hijack an existing message filter. In the example, this is how the NOTIFYICONDATA variable is filled (Fig 3).

This tells the shell to send a WM\_MOUSEMOVE message to the VB form whenever a mouse event occurs on the icon installed in the system tray. This in turn triggers the MouseEventArgs event for the form, so all you need to do is write code there to

respond to the message. The snag is, it is not really a WM\_MOUSEMOVE message, so the parameters need to be decoded. If it were a real WM\_MOUSEMOVE

### Fig 2 Notifyicondata

```
Public Type NOTIFYICONDATA
    cbSize As Long
    ' size of type
    hwnd As Long
    ' handle of window to receive callback
    uId As Long
    ' identifies taskbar icon, may be null
    uFlags As Long
    ' specifies which fields are valid
    uCallbackMessage As Long
    ' callback message to send
    hIcon As Long
    ' handle to an icon for display
    szTip As String * 64
    ' pointer to string for tooltip
End Type
```

### Fig 3 Notifyicondata variable

```
With nidVar
    .cbSize = Len(nidVar)
    .hwnd = Me.hwnd
    .uId = vbNull
    .uFlags = NIF_ICON Or NIF_TIP Or NIF_MESSAGE
    .uCallbackMessage = WM_MOUSEMOVE
    .hIcon = Me.Icon
    .szTip = "Right-click to activate the menu" & vbNullChar
End With
```

appropriate values, and call Shell\_NotifyIcon with the NIM\_ADD parameter. Then you may want to hide your form.

3. Write code for the event triggered by the callback message. This is how you can activate the application.

4. When the application exits, call Shell\_NotifyIcon again with the NIM\_DELETE parameter.

#### Delphi: printing a form

Brian Gorman writes: *"I have set up a Paradox table and associated 'entry' form. I now want to print out the text values of the TTable, TDBComboBox and TEdit controls on the printer in the same relative positions as they appear on the form, which is more than a screen in height. I have thought of using WRITE and WRITELN statements with formatting parameters to position them on the page, but the formatting doesn't seem to work."*

If you have Delphi 3, there is an easy way to print a form so it fits the printed page. The secret is to set the form's PrintScale property to the constant PoPrintToFit. Then the form's print method will print the complete form on the page, keeping its aspect ratio correct.

The following example application implements a print preview showing how the form will look on the page. If you include a print setup dialog in your application, the user can easily switch to landscape mode or even a different paper size, as required. Here is how to construct this example (which is also included on the cover CD):

1. Start a new application and add a second form. The Uses clause for Form1 must include both the Form2 unit and the Printers unit.
2. Form2 is for the print preview and includes an image control with its align property set to a Client. Form1 is laid out as in Fig 5 (p295) and includes a PrinterSetupDialog component. Form1 has its PrintScale property set to PrintToFit.
3. Fig 6 shows the code for the Print Preview button. The other two buttons are trivial. Printer Setup calls the Execute method of the PrinterSetupDialog, while Print calls the Print method of the form.
4. The code works by first sizing the preview form in proportion to the page, obtaining the page size from the global Printer object. Next, it calculates a rectangle in proportion to the form to be displayed, filling either the whole width or the whole height of the preview image but keeping the

aspect ratio the same. Finally, the image of the form is retrieved using GetFormImage, and drawn on the preview form using the StretchDraw method of the image control's Canvas.

This is nice, easy code, but do you really want an exact image of your form printed? More likely, you want to make some layout changes for a printed result, so you need to code

Fig 4 Foreground window

```
Select Case MouseEvent
    Case WM_LBUTTONDOWN '514 restore form window
        Me.WindowState = vbNormal
        result = SetForegroundWindow(Me.hwnd)
        Me.Show
    Case WM_LBUTTONDBLCLK '515 restore form window
        Me.WindowState = vbNormal
        result = SetForegroundWindow(Me.hwnd)
        Me.Show
    Case WM_RBUTTONDOWN '517 display popup menu
        result = SetForegroundWindow(Me.hwnd)
        Me.PopupMenu Me.mnuPopUp
End Select
End Sub
```

### Beginners' Corner: fun with flags

Have you ever seen an Access or dBase table with lots of logical fields? These do tend to pile up in real-world applications. For example, a contact manager might have true-or-false fields for Action outstanding, Hot prospect, Bad payer, Lives locally, No cold calls, Prefers email and On Christmas card list, but it is common to find you need a new option. If you are working with the full version of a database manager like Access, it is easy to add a new field, but not if this is a compiled and deployed application. Imagine if you could just update the executable, leaving the data structure untouched but still delivering the extra fields the user requires. Well, you can. The trick is to use bit-wise comparison to store many logical values in one field. Traditional Boolean fields waste space. In dBase, a logical field occupies one byte in which it stores either a "T" or an "F". But a byte is made up of eight bits, each of which can be 0 or 1. So one byte can actually store up to eight logical fields.

To see this in practice, use your favourite database to define an integer field five digits wide, and call it Flags. This is enough space to store a 16-bit integer value. Next, in your application, define up to 16 constants: xxHotProspect = 1 / xxPrefersEmail = 2 / xxChristmasCard = 4. It is important to start at 1 and double the value for each new constant. The reason is that each constant represents a different digit in a binary number (in binary, adding a zero to a number doubles its value). I've also used a common prefix, "xx", to reduce the chance of a conflict with a constant used by your development tool or by the Windows API. Now all you need is a way of coding and decoding these logical values from the single field. All the popular languages have a special set of operators for this. In VB, the ones you use most are: And, Not, Or. If you prepare a standard VB form using the data control, you will realise that you cannot simply bind checkbox controls to the Flags field. Instead, write code like this for the data control's Reposition event:

```
If (xxHotProspect And data1.Recordset!Flags) = xxHotProspect Then
    chkHot.Value = 1
Else
    chkHot.Value = 0
End If
```

Writing changes back is similar. Code for the Hot Prospect checkbox could look like this:

```
data1.Recordset.Edit
If chkHot.Value = 1 Then
    data1.Recordset!Flags = data1.Recordset!Flags Or xxHotProspect
Else
    data1.Recordset!Flags = data1.Recordset!Flags And Not xxHotProspect
End If
data1.Recordset.Update
Bitwise operators and the Windows API
```

With the size of today's hard disks, the space you save with the above technique is unlikely to be significant. When it comes to the performance of an operating system though, every byte counts, which is why the Windows API uses flags as parameters in the majority of its functions and messages. Using a single Flags field or parameter is often better than a multiplicity of Boolean fields, and makes life easier when you want to add new options. The example Visual Basic application is on our cover-mounted cover CD-ROM. It is for version 3.0 or higher.

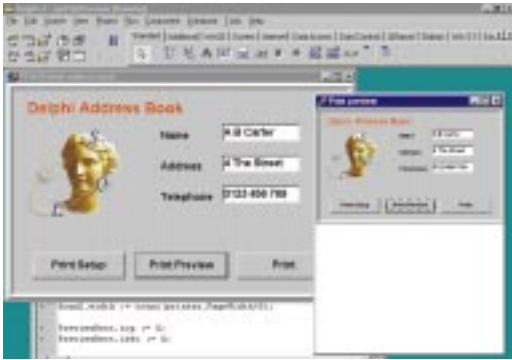


Fig 5 Implementing Print Preview for a Delphi form

directly to the Canvas property of the Printer object. You can set the font and draw to the canvas using methods like TextRect and Draw.

The main challenge is using the right units of measurement, scaling graphics sensibly and keeping track of where you are on the page. There is example code in several books, including *Delphi 2.0 Developer's Guide* (SAMS) and *Using Delphi 3.0* (Que).

### Fig 6 Print preview button

```
Code to implement Print Preview for a form
procedure TForm1.cbPreviewClick(Sender: TObject);

var
  PreviewRect: TRect;
  formratio: single;
  pageratio: single;
  frmBitmap: TBitmap;

begin
  form2.Height := trunc(printer.PageHeight/8);
  form2.Width := trunc(printer.PageWidth/8);

  PreviewRect.top := 0;
  PreviewRect.left := 0;

  frmBitmap := form1.GetFormImage;
  try
    form2.image1.picture := nil;

    formratio := frmBitmap.height / frmBitmap.width;
    pageratio := form2.image1.height / form2.image1.width;

    if formratio < pageratio then
    begin
      PreviewRect.Right := form2.image1.width;
      PreviewRect.Bottom := trunc(form2.image1.width * formratio);
    end
    else
    begin
      PreviewRect.Bottom := form2.image1.height;
      PreviewRect.Right := trunc(form2.image1.height / formratio);
    end;

    form2.image1.Canvas.StretchDraw(PreviewRect, frmBitmap);

  finally
    frmBitmap.free;
  end;

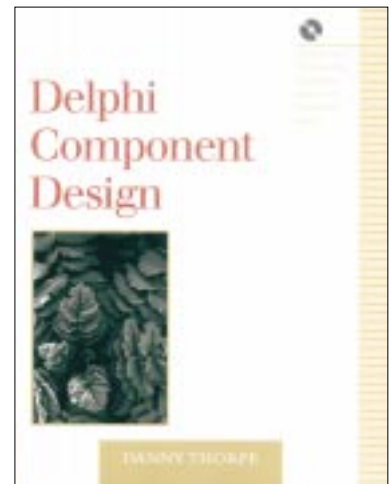
  form2.showmodal;
end;
```

### Books for visual programming — *Delphi Component Design*

It is not quite new, but Danny Thorpe's Delphi book is one of the best. There are plenty of Delphi titles for beginners, but not many for the advanced user looking for help with some of its many under-documented features. Streaming is a classic example, used throughout the Visual Component Library but poorly explained in the documentation. This book is the answer. It is not just about components, but covers key Delphi topics including virtual methods and polymorphism, exceptions, streaming, messaging, COM, and optimisation techniques.

The author works on Borland's development team and reveals the inner workings of Delphi and Windows so that you can make intelligent decisions about, for instance, Dispatch versus Perform versus SendMessage versus PostMessage (all ways of passing messages to application components).

Better still, this is not the typical 1,200-page brick, but a slim 350 pages.



### PCW Contacts

Tim Anderson welcomes your Visual Programming tips and queries. He can be contacted at the usual PCW address (p10) or at [visual@pcw.vnu.co.uk](mailto:visual@pcw.vnu.co.uk)

**Data Widgets 3.0** is £223.25 (£190 ex VAT), from Contemporary Software 01344 873434, [www.contemporary.co.uk](http://www.contemporary.co.uk).

**Delphi Component Design** by Danny Thorpe is £31.99 incl VAT (book and CD) from Addison-Wesley 01279 623928





# Alpha bet

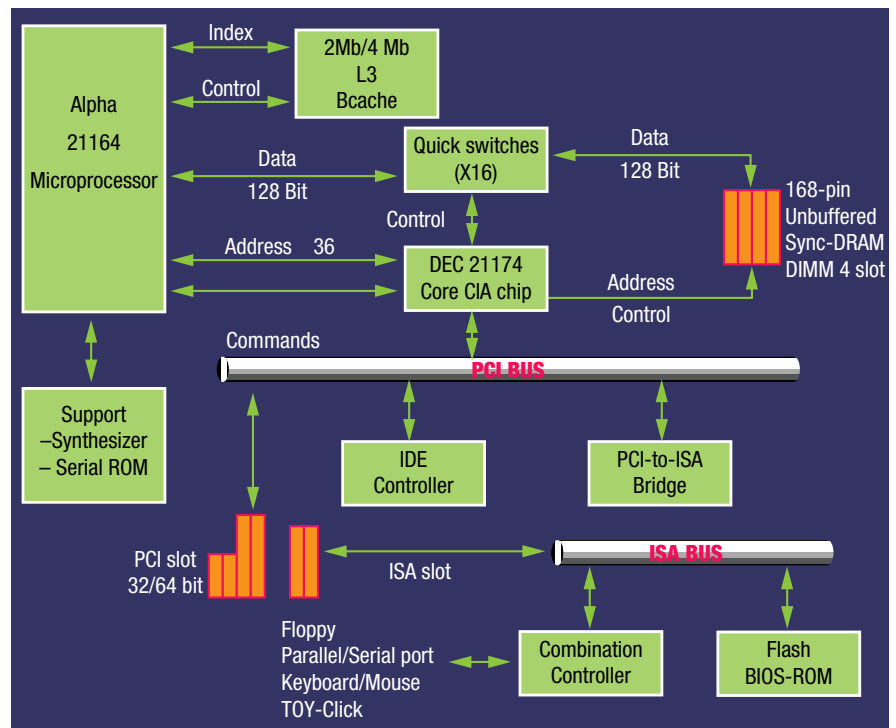
Bob Walder considers Compaq's acquisition of Digital Equipment and its implications in the network arena, especially to Alpha. Plus, he offers advice on upgrading to a two-user system.

**A**nyone with an eye on the networking press in the last couple of months will surely not have missed the biggest acquisition in computing history. With an issue of 50 million shares of common stock and a payment of around \$4.8bn in cash, Compaq Computer purchased Digital Equipment lock, stock and barrel, making Compaq the second largest computing company overnight.

Rumours of the merger surfaced over two years ago, but everything had gone quiet during the past six to nine months. Although it brings Compaq a number of benefits such as 1,600 certified Windows NT technicians, 3,000 Unix professionals and a full line of Unix-based servers and workstations, the likes of Hewlett-Packard and Dell are not likely to view the deal with any great enthusiasm. Quite apart from the powerful competition the merged company represents, Dell in particular could suffer due to the fact that it currently farms out up to 25 percent of its in-field service work to Digital's MCS unit. All this at a time when Dell appeared to be confident of keeping Compaq at bay in the direct selling market.

## Digital destiny

Of course, the competition must learn to take care of itself: that is what competition is all about. However, what concerns many in the industry is what is likely to happen to Digital and its current and former technologies. No doubt most of Digital's mid-range server and workstation lines will survive the transition, but there is a considerable overlap in the areas of desktop PCs and notebooks which will doubtless witness some attrition. Some of Digital's computer manufacturing facilities



**Above** The Alpha system architecture in all its glory

**Below** Eckhard Pfeiffer, president and CEO of Compaq. The company's acquisition of Digital Equipment makes Compaq the world's second largest computing company



could also be for the chop.

The key question is focused around the future (or lack thereof) of the Alpha platform (*illustrated above*). Given the recent rumours regarding Digital offloading the Alpha technology to Intel, it would appear as if the company were trying to ditch the chip before tying the knot with Compaq.

Rumours of the sale of the technology turned out to be just that, rumours, since it transpired that the two companies were merely exploring licensing deals — strange in itself, seeing as Intel is currently developing its own 64-bit chip technology in the form of Merced. Currently, of course,

## Book Review — Novell IntranetWare Professional Reference

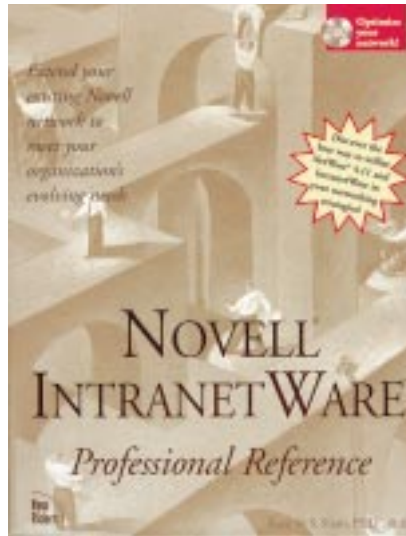
■ Written by industry experts and aimed squarely at NetWare professionals, this book takes you beyond entry-level information and explores the intricacies of managing, maintaining and optimising your network and intranet to meet your company's ever-changing needs.

It kicks off with a detailed introduction to NetWare 4.x (including IntranetWare) and Novell Directory Services (NDS), before moving on to chapters on NetWare installation and NDS security.

Although you may think the installation chapter is superfluous, it actually provides a more concise and useful reference than the stuff supplied with NetWare itself, most of which is buried on a CD somewhere (I personally much prefer a hard copy).

Subsequent chapters go into much more detail on various aspects of NDS, including the scheme and its relationship to X.500, name resolution, partitions and replicas, and time synchronisation. Unusually, it also includes a chapter on developer services, before rounding off part one with a few (though not enough) pages on the web server.

Part two covers the NetWare network environment, looking at some of the system utilities like NetSync and DSMERGE, NetWare client software, server performance tuning, file



and print services, NLSP routing and IP connectivity services (an extremely useful introduction to the latter for those moving from plain old NetWare to the IntranetWare package).

Unfortunately, the accompanying CD-ROM does not contain anything particularly exciting. The most useful content is the online NetWare command reference and the "bonus

chapters" for the book, covering network management, protocols, bridging, switching and routing, WANs and MANs, hardware and troubleshooting.

Of dubious interest are the various "trial versions", "30-day demos" and shareware products which include AlertWare for GroupWise (30-day trial), CD-Vision CD-ROM server software (30-day trial), DS Expert and Config Central NDS tools (demos), Express Meter software licensing (30-day trial) and Tobit FaxWare fax server (demo).

Although you may be forgiven for thinking this book is a little on the expensive side, it does provide almost 1,000 pages of quality reference material which will be of use to any NetWare 4.x administrator. It goes into plenty of detail where necessary, without ever becoming too bogged down in irrelevant technicalities, and includes plenty of explanatory diagrams and screenshots. In short, it is worth any three of most of the bland NetWare tomes currently available and, as such, offers excellent value for money.

**Price** £65.99 (with CD-ROM)

**Author** Karanjit S. Siyan

**Publisher** New Riders

● Thanks to Computer Manuals (0121 706 6000) for supplying me with a review copy.

Alpha is the only 64-bit architecture available for Windows NT, and so is unlikely to disappear overnight.

Intel's 64-bit product is still some way from release, so both Compaq and Digital will be keen to see Alpha succeed in the short term. Beyond that, there are some

serious doubts. Why, for instance, would Compaq want to risk antagonising one of its biggest business partners by competing directly with Intel in the 64-bit processor market? Intel is not renowned for going soft on customers who attempt to sell competing products: in fact, it has a

reputation of being somewhat heavy-handed in such circumstances. Of course, Compaq is a bit bigger than many of Intel's customers and has already indicated that it will be using some of AMD's processors in future product lines. And Digital itself has bought significant numbers of Intel chips in

p301 >

the past while pushing its own Alpha product, so if that company could get away with it, why can't Compaq?

One of the main reasons is that Intel never had a 64-bit chip of its own, so there was little point in getting too stropo about it with Digital. Once Merced is released, however, it seems likely that it will quickly make significant inroads into the market, and Intel will not take too kindly to anyone, even Compaq, raining on its parade. The thing to watch for is whether or not Compaq makes big efforts to push Alpha in the coming months — it certainly has the money and muscle to do almost anything it wants with the product.

If, however, everything stays quiet, you can be pretty sure that although Alpha is safe for the time being, Compaq is intending to yield the marketplace to Intel once Merced appears.

Just returning to Dell for a moment, and the predicament in which it now finds itself, given the loss of one of its biggest field-service partners: one theory had it that Dell would be hoping to increase its ties with Unisys to plug the gap and this would certainly have made sense.

Unfortunately, rumours have surfaced that Compaq is also looking to acquire Unisys (just because you're paranoid, Dell, doesn't mean they're not out to get you!). Interestingly, Unisys has recently announced the demise of some of its server lines, too — slimming itself and its product lines down ready for an acquisition, perhaps? Time to buy some Unisys stock just on the off-chance?

#### Dispatches from the browser wars

Moving from hardware to software now, I just thought I would bring to your attention another significant announcement which has just been made but may well be old hat by the time you read this. (What the heck... It's worth mentioning, anyway.)

Netscape has suddenly done a complete about-face in the browser wars. For a long time now it has battled against Microsoft in the web browser market, staunchly resisting the urge to give away its Navigator and Communicator products despite Microsoft's constant insistence that browsers are a non-revenue market.

Now, not only has Netscape decided to give away the product, but it is also preparing to license the complete source code to its browser, beginning with the March release of Communicator 5.0.

A bit of an over-reaction? Not according to Netscape. The company is determined to keep its browser ahead of the competition and thinks that the most exciting ideas and new developments are likely to come from independent developers. These "improvements" will then be rolled back into the base product to the benefit of everybody, or so the theory goes.

Will this bold strategy actually pay off in the long run? Some will point to other ambitious shareware projects which have spawned some incredibly successful products: the Linux operating system and Apache Web Server, to name two of the best known. Others will point to Unix, a single product which is now a mish-mash of incompatible versions, since numerous different developers were allowed to get their hands on it. Every few years we see renewed attempts to reunite these disparate versions under a single product, but it never quite seems to come off.

It remains to be seen whether Netscape actually has the ability or the inclination to co-ordinate a large number of random developers, all with inconsistent coding styles, while maintaining the quality of the underlying product. I can't help thinking that it could relegate Communicator to being the browser for "propellerheads", while Microsoft's Internet Explorer goes on to become the standard for corporate web browsing. What do you think?

#### Tip of the Month

NT is making huge inroads into the communications and internet server market, frequently playing host to web, email and FTP services in all sizes of organisation.

What is often forgotten is the fact that it is unwise to allow such potentially exposed systems to participate in a domain. They certainly should not be installed as Primary Domain Controllers (PDC) or Backup Domain Controllers (BDC), but rather as plain NT servers installed only in their own private workgroup.

Putting such systems in a workgroup instead of a live domain helps limit possible network penetration should an exposed system become compromised.

Keep in mind that an NT system which doesn't participate in a domain uses a local user database for authentication, so you must use usernames and passwords local to that system if you sign on or access its resources.



## Questions & Answers

**Q** I read your excellent SAPS article [PCW March] and installed the demo version of SAPS, which I got from [download.com](http://download.com). Everything is now up and running (I have been trying to do this for months, literally, with no success prior to this).

A couple of problems, however. I'm running a normal two-PC, peer-to-peer network. When the Client PC goes online I can't access the modem at the Server PC. All I need to do is run a couple of Winsock applications, such as my email program, but I can't.

Also, I am using the demo program which states that it will "expire" after 30 days. Will it prevent me using SAPS, or just give me "nag" screens?

Will Luke

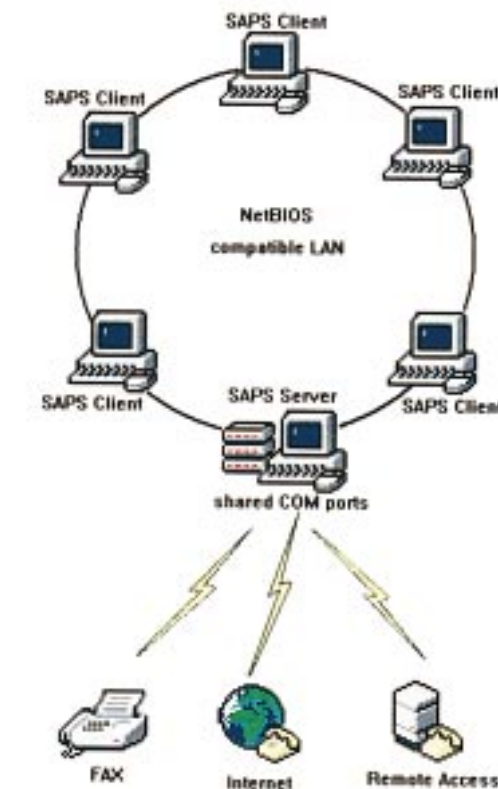
**A** Once you have installed the SAPS software on a server and shared the modem resource, the modem is no longer available locally. All that is required, however, is to install the SAPS client at the server as well and you will be fine. I know this may sound a little long-winded, but it sort of makes sense if you think about it.

I am not sure what happens to the demo software at the end of the trial period but I am sure you will want to purchase it anyway!

**Q** I have designed a simple Access (7.0) database for our patient reminders and contacts. This comprises three tables (the largest of which has about 15,000 records), a few forms and half a dozen queries. Altogether it takes up about 16Mb. It is currently based on a P120 with a 1.6Gb hard disk and 32Mb RAM, and the system is adequately fast with this machine.

At the moment it is in a "back office", but I want to move it onto the front reception desk so that every patient is looked up on the system before the appointment is booked. This will mean having more or less simultaneous access to the system for two receptionists.

I do not envisage that the receptionists will ever want to use their terminals for anything else and I do not plan to connect a printer or modem to



them, or envisage them ever wanting to be linked to a third terminal.

**My question is: what is the most cost-effective way of upgrading (without impairing performance) to a two-user system? I have read of cards which allow two keyboards and screens to work off one PC. I imagine that this would be too slow with the P120, but the P120 could be used for accounts elsewhere in the practice. So, it occurs to me that it might be feasible to buy, say, a P233 with such a card (hence freeing up the P120 to use elsewhere) as an alternative to buying, perhaps, a P200 to network to the P120. Are these "splitting" cards as good as they sound?**

Dr Bruce Evans

**A** Unfortunately I have no personal experience of these splitter cards, as you call them. However, I would be suspicious of anything which forces a standard PC to do anything which it is not designed to: in this case, function as a multi-user system.

I presume that it is not really trying to make the PC support multiple users, but rather, it is merely sending keystrokes and

A sample network, using SAPS [see first question]

mouse movements from two separate sources to the same PC, while sending out the same video display to two screens. But what happens if both receptionists try to do something at the same time?

The other thing to bear in mind is that networks have a habit of growing like Topsy, and though you may have no intention of connecting a printer or another PC at present, who knows what you might want to do in the future?

If it were up to me, I would buy a P200 or P233 with a large hard disk for the back office on which I would install your database files and your accounts system; this would

become the main server in a small Windows 95 network. I would then purchase a lower-spec PC to sit alongside the P120 on the front desk and network the three using a low cost 10Base-T starter kit of some description.

This might not be the most cost-effective short-term solution but will certainly provide the most flexibility and best upgrade path for the future. At some point, for instance, you could attach a printer, tape drive (for backups) and modem (for internet access) to your back-office machine and share these resources among all your PCs.

I am not sure whether this is the answer you were looking for, but then, this is a networking column after all! If anyone has used these splitter devices with any success in a live work environment, however, I would be happy to hear about it and will publish any information in a future column.

### PCW Contacts

Bob Walder can be contacted via the PCW office (p10) or email [networks@pcw.vnu.co.uk](mailto:networks@pcw.vnu.co.uk)

# The last word

Before *Beginners* gets a makeover and a new home, Lynley Oram gets the last word. To round things off, she answers some queries she's received from readers. Also, a look back to booting.

The *Beginners* column in *PCW* has generated a lot of feedback from readers, and we have listened to what you've said. With your comments in mind, from next month we are changing the format to regular "How to" step-by-step workshops.

And while this may be the last time you'll see *Beginners* in this style, we'll continue to cater for those of you wanting to learn more about the technical nitty-gritty of your computer. The new, improved Hands On Workshop section is going to be bigger, better and more informative than before. Check it out next month, and give us your verdict.

To round things off here though, we've decided to dedicate this month's column to some of the questions you've asked.

**Q I would like to delete my temporary files. How I can be sure which ones are safe to delete, because when I try to look at them to check, I cannot read some of them. Is it safe to delete all files with the extension .tmp whether or not they begin with a tilde ~, and are there any other files I can safely delete? I use Windows 95.**

Geraldine Nesbitt

A Yes, it is safe to delete all files with the extension .tmp. These files are created each time you open a document to work on, but often hang around clogging up hard-disk space after closing the document. This can be particularly important to anyone working on large image or audio files.

In Windows 95, open Find File by right-clicking on the Start button and selecting Find. Using the Browse button, select the C: drive, or whatever letter is assigned to your hard drive, in the Look In window. In the Named window type in \*.tmp. This is a wildcard search — it is telling your PC to look for all files with the extension .tmp regardless of what name they have been given.

Once the search is complete, you'll have a list of the .tmp files found on your hard drive. Highlight all the folders by choosing

Select All from the Edit menu, or, by holding down the Ctrl and Alt keys simultaneously, highlight individual files.

It's good practice to leave the ones that have today's date on them, which could help you recover documents lost after a crash. Also, Windows normally prevents you from deleting currently active files: that is, the files or their temporary counterparts which are currently open in an application. It doesn't matter whether .tmp files have the tilde ~ or not, although most of them do.

There are other files which are safe to delete. When you run ScanDisk, your PC will put any recovered lost clusters into a file with a .chk extension. If you are happy with your PC and everything is running fine after the last ScanDisk, then it is okay to delete these files as well. Help files, those with the extension .hlp, can also take up a lot of space. Only delete those help files that you no longer need. It is easy to forget about graphics files, especially those downloaded from the internet. Look for any graphics files using the most common program extension you use — .bmp, .tif, .gif, .jif, to name a few.

**Q I got something on a trial CD called WinDelete 97, which finds lots of "debris" on my computer to delete. I have two questions: (1) There are lots of .CAB files. What are these, and which of them can I delete? (2) WinDelete finds lots of empty files with 0 bytes in them. Is it safe to delete all of these?**

Dr Rob Mayer

A Some PC manufacturers load all the files from the Windows 95 CD-ROM onto the hard drive. This means that if you decide you want to make changes to your Windows Setup (go to Control Panel, select Add/Remove Programs, click on the Windows Setup tab) you won't have to insert the Windows 95 CD-ROM. These files are compressed and have the extension .CAB.

While it is convenient to keep these on the hard drive, they do take up valuable space. This won't be a problem if you've got a huge drive, but you may want to delete these files if space is at a premium.

Before you do, make sure that you still have the Windows 95 CD-ROM. If the manufacturer hasn't included one in the box, ask for it — you are entitled to have one. Patches and add-in cards can also deposit .CAB files on your hard drive. Again, if you've still got easy access to these bits of software, then deleting the .CAB files shouldn't leave you stranded.

**Q My company manually files thousands of invoices each year. Is there a Unix application available we can use to scan invoices for archiving? This would mean fantastic savings in eliminating the need for an employee to sort and file the invoices in number order prior to them being stored away. Also, should a document need to be retrieved, we would no longer have to locate the invoice in some dusty corner of the warehouse.**

Afdemarco

A First off, you will need a scanner with a document feeder, unless of course you want to replace the drudgery of sorting and filing with standing and feeding each page into the machine one by one. Keep your eyes on *PCW*, as we often review scanners and mention which ones feature optional document feeders.

You will also need suitable software, but sadly there is absolutely nothing available off-the-shelf for Unix. You will have to get something custom-made to suit your company, an option which, while expensive, does have its advantages.

**Q I use DOS just to play games, but would like to know a bit more about it. I don't even know how to navigate my way around, except to find Doom. Being without a mouse is scary.**

E Mann

A DOS is a command line interface, as opposed to Windows which is a GUI (graphical user interface). This means there's no nice graphical representations of your computer's innards to help you navigate — you have to do all the visualising in your head instead.

Think of the directories in DOS as being like Windows Explorer. At the top you have your hard drive, C:, often referred to as the root directory. Branching down from C: are various directories, which can have names of up to eight letters in length only. In Windows Explorer these directories would be depicted as folders, such as My Document and Program Files. In DOS, some of these folders, or directories, contain other sub-directories. Windows Explorer makes this easy to see at a glance because there's a plus sign next to the folder, and anyway, you can view that folder's contents in the right-hand pane. In DOS you have to ask for a list of a directories contents. It doesn't matter whether you type in capitals or not, as DOS isn't case sensitive.

Here's a few tips: Let's start by looking at the contents of your hard drive, C:. Restart your PC into MSDOS. It will probably come up with `C:\Windows>`. You will need to get back to the C: prompt. Using the command `cd..` will take you back one step in the tree. In this case, one step back is the C:

prompt, but if you were buried further in, `cd\` is a shortcut to the C: prompt.

If you want to display the contents of a directory, then the command to use is `dir`, but if there's a lot in the file you might not be able to see it all on the screen at once. In that case, try `dir /w`.

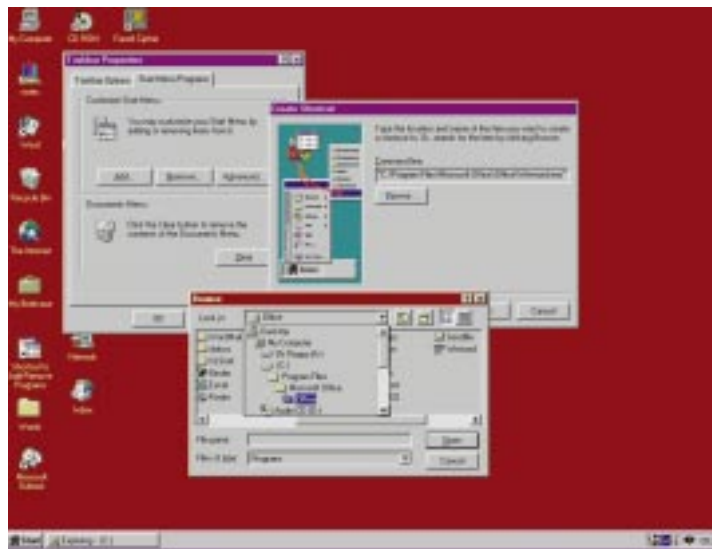
Some directories, such as Windows, have stacks of files in them. If you are looking for something in particular but only know the file extension (.bat, for instance) then try `dir *.bat`, or if you want all .bat and .bak files, try `dir *.ba?`.

To see the names of all the files and extensions, type `dir *.*`, or if you only want to see files with the name command but don't care about the extension, typing `dir Fred.*` could be a solution. Got lots of junk cluttering up your screen now? Then wipe it clear using the command `cls`.

**Q** I created numerous documents and installed several programs which I no longer need. I have deleted them, but their icons still exist.

Bewildered Fred

**A** Right-click on the redundant icon and select Delete. Alternatively, highlight the icon and hit the Delete button on your keyboard. If you have stuff still listed in your Start directory even though you have deleted the program, then right-click on your Taskbar and select Properties. Click on the Start Menu Programs tab, hit the Remove button, highlight whichever file you'd like removed and hit the Remove button.



Placing a shortcut to a program in your start-up folder will cause it to launch each time you start your PC. It does save a bit of time and effort if there's a particular program that you use most of the time

**Q** When I start my PC, Wordpad automatically loads and sets itself up. As I do not use Wordpad that often, it is annoying to have to wait for the program to load before I can get started and use my PC.

Andy Wilson

**A** Any apps automatically launching when you start up your computer can usually be found as shortcuts in the aptly named Startup folder. Get to Start Menu Programs (as outlined above) and hit the remove button. As you scroll down the list you'll see a folder called Startup. If there's a plus sign next to it, it means there will be a shortcut to a program in there — in your case a shortcut to Wordpad, which will cause that program to launch when you start your PC. Just highlight it and hit remove — it's only a shortcut, and deleting it won't do any damage.

Of course, this works both ways. If there's an application that you use the most, for example Microsoft Word, then you can add a shortcut to this to your Startup menu. Instead of clicking on the

Remove button, click on Add. If you don't know the command line (and I don't usually carry stuff like that around in my head either) click on Browse and scroll through the various folders until you find the program icon you want.

**Q** I have just bought a Packard Bell Pulsar 16, 166MMX PC. I believe I can create a pretty good database for my 4,000 LPs, 1,500 CDs and 2,500 cassettes but not with the utility within

Word 97. What package should I use and will it tell me exactly how to reach my objective?

NW

**A** Our databases expert, Mark Whitehorn, answered this one for us: "You need a DataBase Management System (DBMS) like Access or Works (Works is actually a multi-faceted package but it contains a DBMS). Sadly, they never tell you exactly how to reach your objective, as there is some learning involved.

"Having said that, Access has some Wizards which will generate databases for you, one of which, if memory serves, is to do with cataloguing music collections."

## System disk update

Last month's column was dedicated to making your own Windows 95 startup floppy disk (or boot disk, as it's known). If yours still won't work, or if the prospect of doing it yourself is just too daunting, then check out this month's cover CD.

Dan Computers has kindly allowed us to give away a copy of the boot disk it ships with its PCs. It not only restarts your PC, but offers you a few options too. If you want to reformat your hard drive, for example, it will take you through the process. Just copy the contents of the W95Boot folder onto a floppy disk and try it out. So far, it has worked in all the machines we've tried it on here.

## PCW Contact

The Beginners column will return in a different format next month. If there are any subjects you would like to see covered, contact us at [pcw@vnu.co.uk](mailto:pcw@vnu.co.uk)



# PCW Reader Offers



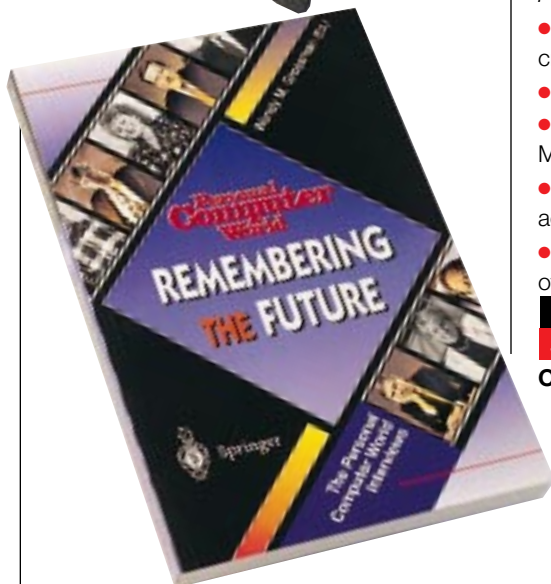
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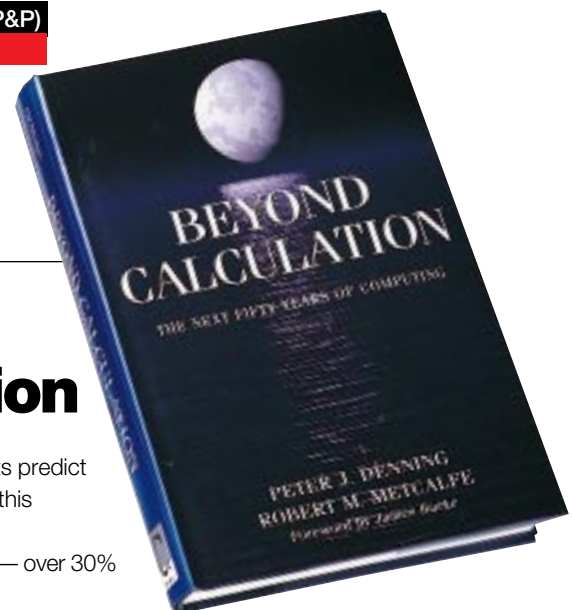
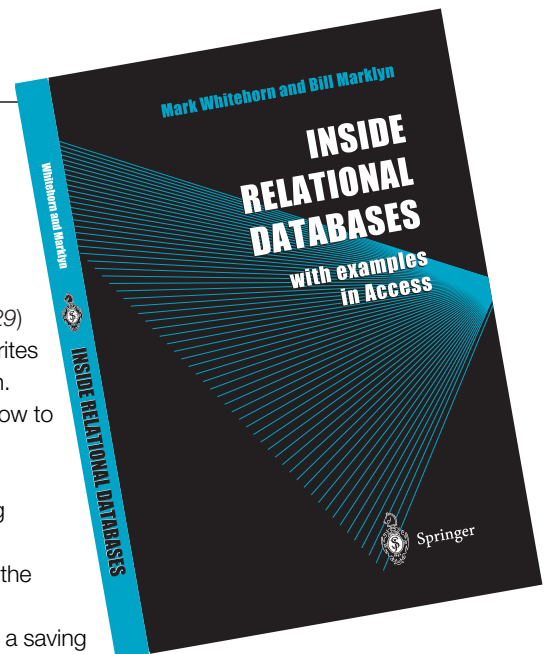
(reviewed in PCW November 97, p329)

- Written by Mark Whitehorn, who writes PCW's Hands On Databases column.
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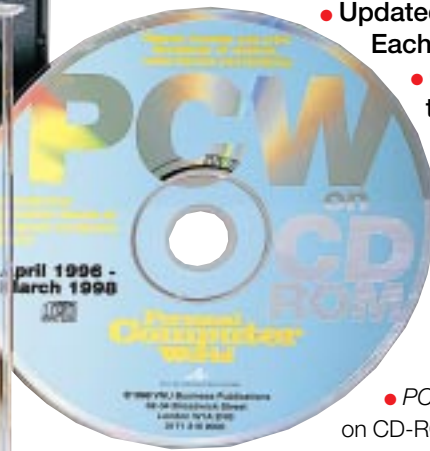
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# Get a winning hold on a handheld

In this month's competition you can win a fabulous PDA from Geofox, or you can Jaz up your backup with a drive from Iomega. And beware of the dog — guard your net privacy.

## Geofox One PDA

Personal Digital Assistants (PDAs) are becoming very trendy accessories these days. So if you prefer your pen and paper to your plastic palm pal, then look away now — this prize is only for PDA wannabes.

Geofox, developer of the yummy Geofox One Professional (reviewed last month in our PDA round-up), wants to give *PCW* readers a chance to win one of its cool 16Mb Geofox One palmtops. The Geofox One worth £499 is the size of a slim paperback book, yet it has the largest and clearest screen of any handheld computer and a PC-style keyboard featuring a GlidePoint touchpad. It offers a comprehensive set of features including email, fax services and internet access.

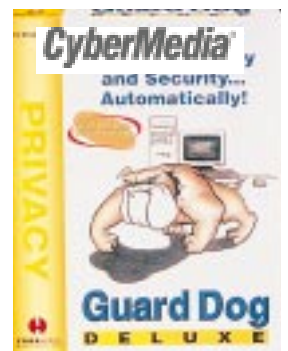
Geofox One also comes with full-featured word processing and spreadsheet applications, and a complete set of personal organiser features such as diary, database address book, alarm and calculator.

■ To enter this competition, send a postcard with your name and address to "PCW Geofox Competition", to the address in the box below.



## Cybermedia Guard Dog

If dogs don't scare you, then this one should. Guard Dog Deluxe is the meanest mutt in town and Cybermedia is giving away ten copies worth £49.95 each.



Guard Dog Deluxe protects your internet privacy and security automatically, and is the reliable way to safeguard your personal files and web-browsing habits. It includes full virus protection, and blocks hostile internet programs from damaging your hard drive or accessing your private files. It scans and removes viruses from downloaded programs and email attachments, and even updates itself so it can block the latest viruses or hacker attacks as they emerge.

To enter this competition, send a postcard with your name and address to "PCW Guard Dog Competition" at the address below.

## Iomega Jaz drive

If you're into storage, backup and all that jazz, then you'll like this next prize.

No, we're not throwing Miles Davis CDs at you, but we are giving away a fabulous Iomega 2Gb Jaz drive (either internal or external) worth £460 plus a pack of three disks worth £300.

The Jaz 2 drive combined with a complete software suite provides twice the capacity and a 40 percent higher performance than the original Jaz drive for desktop and mobile computing. The Jaz 2 drive exceeds the performance of other removable storage products available today by operating at an impressive maximum sustained transfer rate of 8.7Mb per second. Jaz 2 drives and 2Gb disks enable users to create, store, catalogue and share large files such as space-consuming scans, entire web sites, digital movies, sounds and photos, large graphics files and

databases, on a single 2Gb Jaz disk.

To enter this competition, send a postcard with your name and address to "PCW Iomega Competition", to the address in the box alongside.



## How to enter the competitions

1. Via our web site at [www.pcw.co.uk](http://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 with the name of the competition and send it to: P.O. Box 191, Woking, Surrey GU21 1FT.  
**Entries must arrive by 29th May 1998**
- State clearly on your entry if you do not wish to receive promotional material from other companies.

## Rules of entry

These competitions are open to readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications, Geofox, Iomega and Cybermedia. 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.



# Wreckin Crew **PREVIEW**

**D**ue for release at the beginning of May, Wreckin Crew has been designed in a Wacky Races-type way with gameplay very similar to that of Mario Kart in an arcade style. It is filled to the brim with zany characters, each one with mad, comical weaponry. Ma is an

elderly lady who hinders her opponents with an elephant gun and makes them drunk by letting off an alcoholic vapour. Sir Cuss likes to dump white bunnies in your path, and Lady Bird has a magnet that holds your car stationary for a few seconds.

For driving, you have a choice of

vehicles ranging from a 1957 Chevrolet to a heavily modified Ford pickup truck. There are a variety of racing locations each with unique tracks, so every race you run is different. As well as the normal racing modes there are cup competitions, head-to-head death-matches and stunt arenas.

Although Wreckin Crew is not yet complete, there is one thing I dislike about it. The controls would only work through the keyboard and it was very difficult to master



them. The car speed was too fast, and I found that one tap of a key would send the car flying to the other side of the road.

Wreckin Crew is racing with added fun, but if you're expecting TOCA, V Rally or Grand Theft Auto, forget it.

Etelka Clark



Caught by Lady Bird's magnet

## PCW Details

Price £34.99

Contact Telstar 01932 222232

[www.telstar.co.uk/tes](http://www.telstar.co.uk/tes)

**System Requirements** Windows 95, 16Mb RAM, P60 CPU, 4x CD-ROM drive.

★★★★★

# Armor Command **PREVIEW**

**E**dward Kilham is the man responsible for X Wing and Tie Fighter and should be praised without stint for two of the most addictive, immersive games ever seen. Armor Command is a cross between these excellent space-faring games and the sophisticated, if baffling, Mechwarrior 2 (on which he also worked).

The year is 2910 and the United Terran Federation is at war with alien forces, nasty

types who have apparently "evolved an extremely decadent and self-orientated culture to the point that they believe as a people they are destined to rule the universe". You can choose to play as either race in a total of 48 different missions, set on a variety of planets.

There is an awful lot of strategy in Armor Command but it is not a game like tCommand and Conquergame. The third-person perspective graphics give you

the feeling of being immersed in the gameplay, but the complexity of the controls and missions means it can take quite a while to get to grips with things.

If you like to step into a game and get going straight away, Armor Command is not for you — it takes patience and concentration to master the different elements. But if you are a strategy nut with plenty of time on your hands, you will love Armor Command.



## PCW Details

Price £34.99

Contact Take 2 Interactive Software  
01753 854444 [www.take2europe.com](http://www.take2europe.com)

**System Requirements** Minimum: Windows 95/NT, 90MHz Pentium processor, 16Mb memory, SVGA 1Mb RAM, Direct Sound compatible sound card, 2x CD-ROM drive. Recommended: Windows 95/NT, 133MHz Pentium processor, 16Mb memory, 3D card with 2Mb RAM, Direct Sound compatible sound card, 4x CD-ROM drive, Direct Play compatible 14.4Kbps modem

★★★★★



On the tail of an enemy transporter

Adam Evans

# Monopoly World Cup



To mark this year's World Cup, Hasbro has launched a special edition of Monopoly dedicated to the football theme.

The concept behind the World Cup version is just the same as the traditional, except instead of buying famous streets and roads, you are buying football teams and their grounds. Once you have collected a set, you can then build terraces and eventually stadiums.

This game is pure pleasure to play as the animation is superb. Your playing piece is a footballer who, when the dice is rolled, skips along, bouncing and kicking his ball to its correct destination.

When he wins or loses money, he either cheers or throws up his arms in despair.



Being stropy costs you

The animation is optional and if you choose to see it, you will not be disappointed.

Up to six players can play on one PC, and players can be a mixture of human and computer participants. Networking isn't available however, which is unfortunate.

Other animated features include the auctioning of property. Rich Uncle Milburn Pennybags dons a hammer and gives players a chance to bid for properties.

The continuous jeering of crowds in the background gives you a great match vibe and really gets you into the World Cup mood. This game is beautifully designed and a must for any Monopoly-loving footie fan.

Etelka Clark

## PCW Details

Price £39.99

Contact Hasbro 0181 744 5767  
[www.hasbro-interactive.com](http://www.hasbro-interactive.com)

**System Requirements** Windows 95, 6x speed CD-ROM drive, 16Mb RAM, Pentium 133 or higher, DirectX version 5.0 compatible drivers.

★★★★★

# Black Dahlia

Black Dahlia represents the future of 3D adventure games, blurring the line as it does between a good

game and a good film. This new release from Take 2 Interactive is a labyrinthine murder mystery set during WWII, that spans five years, two continents and an epic eight CDs. You play Jim Pearson, a rookie investigator with a wartime intelligence agency, who is given nothing to start with other than the odd clues lying around his dusty office. The makers claim the game was

"inspired" by the real-life unsolved Black Dahlia slaying, and they have spun their own bizarre version of events.

The gameplay in this version allows better interaction with your surroundings than in most games, and Pearson can examine every one of the 80 locations he finds himself in. The innovative 360-degree view scrolls

Look for clues in a beautifully drawn spine chiller



beautifully around the stunning digital artwork, and the gaming interface is well judged and user friendly. Unlike the recent Blade Runner release though, there is only one definitive ending to the game, and I can't see many people repeat-playing after they have solved the case for the first time.

This is not a game for those who like



fresh air and natural light. To finish it you will need Mensa-level intelligence, good posture and a few weeks' paid leave. And if you can't arrange all that, it's this year's best reason to play truant.

Paul Trueman

## PCW Details

Price £39.99

Contact Take2 Interactive 01753 854444  
[www.take2games.com](http://www.take2games.com)

**System Requirements** P90 (P120 recommended), 4x CD-ROM, VGA card (512Kb memory), 20Mb hard-disk space, sound card, Windows 95-16Mb/DOS-8Mb

★★★★★

p318 >



# CART Precision Racing



**M**icrosoft's CART Precision Racing races you against the best car drivers in the world and claims to recreate the total Indy experience in every detail. This game is very impressive to look at and play. It looks good enough when simply using the software to render the images, although if your graphics card is compatible with Microsoft's Direct 3D, the card can do a

lot more of the 3D rendering, transforming the look of the game. A smooth, curvy world of sculpted trees and skyscrapers



Follow that car: the race is on to burn rubber

flies by, with the blue sky perfect in every detail, and all accompanied by the fabulous din of revving engines and heated rubber. If you can drag your eyes and ears away long enough, then you can race a whole season, battling your way

round the 25 laps per race, and tweak your car's frame and tyre pressure after every lap. This can be an exhaustive, exhausting game that allows you to turn your hand to almost every aspect of the sport. Or you could just spin through a three-lap race, setting all the controls to auto-pilot so that it virtually drives itself round the track.

If you're a gamer who likes to dive straight in and put pedal to metal, you will be frustrated at this game's complexities. But if it's a thoughtful, complex Pirelli-melter you're after, Precision Racing flies through its MOT.

Paul Trueman

## PCW Details

Price £39.99

Contact Microsoft 0345 002000

[www.microsoft.com/games](http://www.microsoft.com/games)

**System Requirements** P60 (P166 recommended), 8Mb RAM, 30Mb hard-disk space, 4x CD-ROM, SVGA display 16-bit colour, Windows 95/NT 4.0

★★★★★

# Battlezone

**A**ctivision's Battlezone is set years into the future, but the storyline is based on the now defunct cold war space race. The two superpowers must pit themselves against each other in order to win control of the galaxy and its precious resources.

Battlezone isn't hard to master. Many keys can be used, and with skilful use of the mouse and a few choice keys, your tank or bomber will be up and running. The idea is to perform an array of tasks like escorting cumbersome Scavenger crafts, collecting bio-metal and establishing and protecting bases. It is when you are protecting the base that the shooting bits come in — you must shield your units from attack while blasting your enemy to bits, too.

The scale of the game can be

The action is fast and furious in these cold war capers



overwhelming at times as your fleet of craft expands, but control is fairly easy through the Command Interface and the Smart reticle. The Interface is like a drop-down menu which simplifies contacting and controlling your units, and the reticle is similar to your gunsight, through a



target, but much better.

Battlezone is a challenging game with impressive details. It is particularly good if you have a 3Dfx card.

Jim Haryott

## PCW Details

Price £39.99

Contact Activision 01895 456700

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

**System Requirements** Win95, Pentium 120MHz or faster (P166 recommended), 16Mb RAM, 160Mb hard-disk space, 2x speed CD-ROM drive or better, 28.8Kbps modem (only if used over the internet).

★★★★★



# MSX appeal?

The MSX range was Microsoft's first attempt at a hardware platform, and it was less than successful. Simon Collin reports.

**S**itting here in Seattle, I feel compelled to write about a product from the local corner shop, Microsoft. Does this software giant sell hardware? You bet. In fact, although most users will probably only think of the MS-Mouse, the hardware division had over \$350m in revenue last year. Luckily for this column, back in 1982 Microsoft decided to launch a bid for the home computer market, which failed.

Executives at Microsoft had seen the success of IBM and the way in which it had created a standard hardware platform. Microsoft wanted to do the same for the home. It worked with a Japanese partner, the ASCII Corporation (nothing to do with the characters) and together, the pair created a new basic specification for a hardware and software platform, called the Microsoft Extended platform (MSX for short).

Microsoft and ASCII joined forces with a group of huge, powerful Japanese electronics companies which would license and produce the machines. The manufacturer's roll-call was impressive: Sony, Toshiba and Hitachi were among the top names. In 1983, the first range of products were launched at an electronics trade show in Japan. A good reception and initial sales of over 250,000 units meant another winner for Microsoft.

## The waiting game

In the UK, the bulk of the MSX computers were produced by Philips. It was launched with fanfare and soon after there was even an MSX-specific magazine on the shelves for the most enthusiastic users. However, the big nut to crack was the US; here, the manufacturers tested the market and got a poor reception. This was mostly due to the lack of disk drive for the MSX computers: software was supplied on cartridge or ROM. Everyone waited. And waited. Then, in mid 1984 Microsoft delivered the MSX-DOS feature that allowed the MSX range

to use a disk drive. The Japanese manufacturers took a while to include this feature and the new product line was not delivered to the US until 1985.

Now I've gone this far, you might like to know what powered this hardware platform. Being destined for use as a home computer, MSX was great for graphics and sound. It included a good synthesiser plus a MIDI port as standard (eventually,



Yamaha sold MSX computers as MIDI processors). The graphics included great colour and sprite control for impressive games, if any were developed.

The rest of the machine was driven by a standard 4MHz 8-bit Zilog Z80 processor (the same as the Sharp MZ-80K, from a couple of issues ago, and the rival to the 6502 8-bit processor popular in other home computers). The top model had an impressive 64Kb of RAM with BASIC-MSX stored in ROM. As mentioned earlier, software was added either using slot-in ROM modules or by cassette tape. Most users spent hours programming in BASIC-MSX (no, I don't why it wasn't called, more logically, MSX-BASIC) which gave them excellent control over sound and graphics.

So, now we have a good, well-packaged, neat little computer that is surprisingly fast

and is ideal for the home market. But this did not help; by 1985, trying to sell an 8-bit computer was hard work. 16 and 32-bit processors were on the way and for a little more than an MSX, you could get one of the newly-launched Atari ST computers that were all the rage. The second big, big problem was that the partnership could not convince other software houses to produce applications for the MSX platform. To get

around at least one of the problems, the Microsoft/ASCII partnership planned a 16-bit version of the Z80 processor that drove the MSX. In fact, the designers of this new processor produced such a good chip that it was licensed back to Zilog, developer of the original Z80.

## Turbo tweaking

This new 16-bit technology gave the world MSX-II machines in 1985. To boost power, further tweaks were made to produce the MSX-II Turbo range in 1988, but only Matsushita produced units; Sanyo decided to put its new development on hold and Sony pulled out of MSX technology. Microsoft and ASCII parted company and Microsoft opened its own office

in Japan to push on with the technology.

So there we have a simple case of a good product, well made and with great specifications, but using old technology and launched into a hostile market. Rival products outgunned the poor MSX on all sides and no punter was willing to spend money on old 8-bit technology. And with the exception of IBM and its disastrous PCjr, home computers were selling well and the MSX simply could not match the new models from Atari and Commodore.

Chalk up the first and only product from the Microsoft hardware division that was not a success. It will be interesting to see how the division works with pretty much the same group of manufacturers on the release of its PalmPC range of PDAs that use Windows CE, to be launched in a couple of months. ■

# Brainteasers

### Quickie

Can you spot the next letter in the series:

**C C G G A A G**

(Clue: are you musical?)

### This month's prize puzzle

Short and sweet, this month's problem. It could almost be a quickie, except it's not as easy as the usual quickie and a bit of programming will probably be needed for its solution.

A certain 5-digit number in one base has the same decimal value when its digits are reversed in another base.

#### Example:

**ABCDE base x = EDCBA base y**

where each letter represents a different

numerical digit and neither A nor E are zeroes.

What is the number **ABCDE** and the two bases **x** and **y**?

Send your answers on a postcard or the back of a sealed envelope, to:

PCW Prize Puzzle - June 1998, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20th June 1998. *Do not send solutions on floppy disks or in envelopes.*

### Winner of March 98 prize puzzle

There was a small oversight in the March problem. Our intention was that each term in the series should be equal to or greater than the preceding one, and we should

have said that. However, since about 50% of the entries had the second term greater than the third, we accepted either answer.

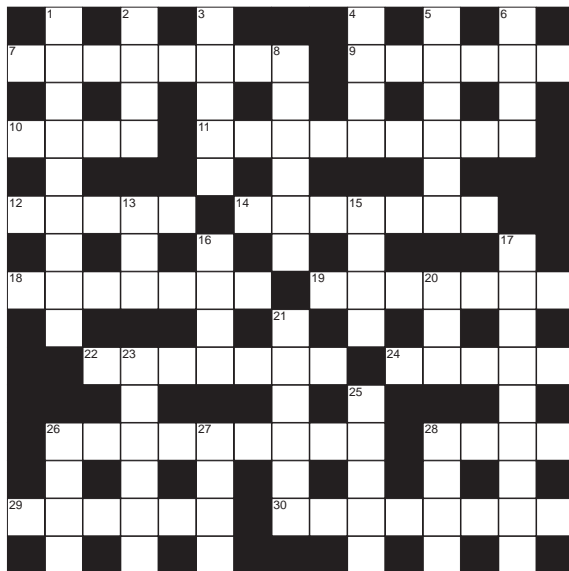
As it was, the problem was either too difficult or too boring, since we received only 85 entries, a dozen of which came from overseas. From the correct ones we randomly chose the winner, who is Mr Martin Fisher of Atherstone in Warwickshire.

Our solution was that the lowest unused term was 4366. The solution if the second term can be smaller than the third, and the one submitted by Mr Fisher, is 10484.

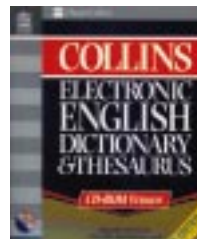
Congratulations, Mr Fisher, your prize is on its way. To all the others — keep trying, it could be your turn next.

JJ Clessa

# Prize Crossword No. 8



Haven't got a clue? Maybe you could do with the help of the Collins Electronic Dictionary & Thesaurus.



Each month we're offering one lucky PCW reader the chance to win a copy. Send your completed crossword to PCW June Prize Crossword, VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive by 29th May 1998.

• Please state clearly on your entry if you do not wish to receive promotional material from other companies.

- 4 Big slice (4)
- 5 Deliberately annoys (6)
- 6 Manager (4)
- 8 Autographed (6)
- 13 Shack (3)
- 15 Space (4)
- 16 Zone (4)
- 17 Inconsistent (9)
- 20 Crucial (3)
- 21 Insist on (6)
- 23 Put off till later (6)
- 25 Is aware of (5)
- 26 Regular (4)
- 27 Rotate (4)
- 28 Tug (4)

### ACROSS

- 7 Linked PCs (8)
- 9 Go-anywhere computer (6)
- 10 Key for when you're lost (4)
- 11 Usual memory units (9)
- 12 Rapid additional memory (5)
- 14 Screen's pixel-change speed (7)
- 18 Distinct disk parts (7)
- 19 Internet personal data parcels (7)
- 22 Uses the top-left 20 down! (7)

- 24 Co-ordinates timers exactly (5)
- 26 Screen over-use danger (9)
- 28 Peripherals slot (4)
- 29 7's co-ordinating computer (6)
- 30 Grab data (8)

### DOWN

- 1 Demoted (9)
- 2 Exchange (4)
- 3 Legal offence (5)

### May solutions

#### ACROSS

- 7 Floppy disk 8 Boot 9 Download 10 Pascal
- 11 Author 13 Monitor 15 Segment 17 Hot link
- 19 Buffers 21 Report 24 Dialog 26 Transfer
- 28 Word 29 Error codes

#### DOWN

- 1 Allocate 2 Spinet 3 Typo 4 Windy 5 Skip
- 6 Potato 8 Bestial 12 Owner 14 Ozone
- 16 Muffled 18 Nattered 20 Unison
- 22 On show 23 Storm 25 Glee 27 Airs

# Books

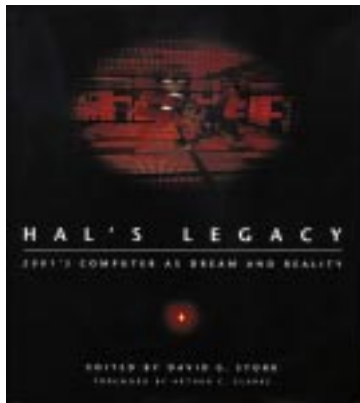
A collection of essays inspired by the legendary HAL, a guide to what's funny — and sleazy — on the net, and an email thriller.

## ■ HAL's Legacy: 2001's Computer as Dream and Reality

David Stork's thought-provoking and consistently entertaining anthology of essays by experts in AI (artificial intelligence), IT and philosophy takes as its focal point HAL, the paranoid computer which attempts to bump off its carbon-based crewmates when it fears for the successful completion of its mission objectives.

More than a quarter of a century on from the creation of what is surely Arthur C Clarke's most human character, Stork asks how close we are to delivering the promise (or threat) of a truly "intelligent" computer which can lip-read, think, feel, lie and kill.

There are a hundred reasons to love Clarke and Kubrick's masterpiece, 2001: A Space Odyssey, from its consistently stunning cinematography and music score, to its slavish avoidance of sci-fi cinema's laser zaps and roaring rocket motors that are guaranteed to irritate. Central to any analysis of 2001, though, is an examination of the interplay between the story's heuristically programmed algorithmic computer and its often less-than-human colleagues. Here, Stork's analysis presents an engaging picture of today's AI art.



*HAL's Legacy* provides an ideal opportunity to get up to date with developments in pattern recognition, speech synthesis, chess-playing and fault tolerance. An essential sidetrack along the way is

Daniel Dennett's essay on computer ethics ("When HAL kills, who's to blame?") which questions what responsibility we could lay at the door of any intelligent agent that kills to further its human-programmed goals.

As a footnote, those wishing to bring something of HAL's idiosyncratic personality to their own desktops can ask their favourite search engine to hunt down the amusing, if somewhat pointless, MacHAL (there is a Windows version) that greets you with a blood-red "eye" and blandly reassuring soundbite at start-up (try [www.liv.ac.uk/~nce/personal/hal\\_9000.htm](http://www.liv.ac.uk/~nce/personal/hal_9000.htm)).

Just make sure you don't lock your door the next time you go out shopping for computer gear, though. There's every danger that your newly HAL enabled computer will refuse to let you back in the house...

Chris Solbé

## ■ A Boy and his Mouse

This is the sequel to Jon Casimir's *Postcards from the Net* and is, indeed, very similar. This updated version cuts through internet jargon and gives an intelligent explanation for it all. It discusses how the web is changing, internet copyright and how to shop online. There is also a section called "Remembering the human", which lists topics ranging from pregnancy to online weddings and suggests the best web sites for these.

Other chapters in this book focus on the weird and wonderful sites that can be found on the internet. "Belief and Disbelief" discusses the Loch Ness monster, Father Christmas and guardian angels, and suggests a web site called "The Jesus home page" which was, allegedly, created by the man Himself.

"Sex Crazy" is the eye-catching title of one chapter, where adult chat sites are discussed and some of the hottest are listed. For men who prefer their internet sites sleazy, check out one called "Babes Are Us" where men get to chat to women while viewing them through a video-cam, rather like phone chat lines. These women will do almost anything for you... as long as you're paying your six US dollars per minute!

If you're female and thinking of visiting Disneyland in Florida — beware! The thing to wear on the Splash Mountain ride is a boiler suit because, apparently, men think

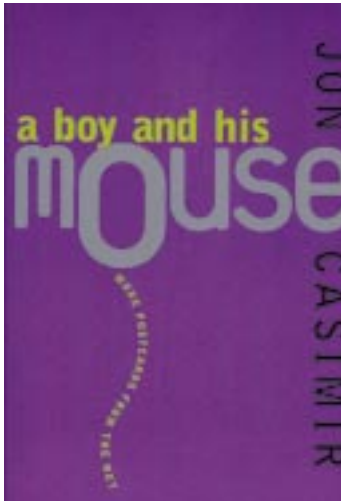
You can get free postage and packing and 15% discount on any of the books reviewed here if ordered by 30th June, 1998, from Waterstone's book mailing service on 01225 448595, or by ordering through our internet bookshop at

- 1 *HAL's Legacy: 2001's Computer as Dream and Reality*  
ed. David G Stork  
£46.95 £14.40
- 2 *A Boy and his Mouse*  
Jon Casimir £8.99 £7.65
- 3 *Exegesis*  
Astro Teller £6.99 £5.94

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it's pretty damn funny to lean around and pull up your top and bra, exposing your breasts to the elements of the wet and wild. The problem is that as you go down the ride, a camera opposite you flashes away and your breasts could join those of many other poor individuals on a web site called "Look at me".

*A Boy and His Mouse* has a very different content from *Postcards from the Net* and, the sleazier element aside, is very funny. The internet is not as dull as some people might think, and you may be shocked to discover just how strange a web site can be. If you're on the net and you're looking for a laugh, this book is a good guide.

Etelka Clark

#### ■ Exegesis

Astro Teller has my fullest admiration for his book, *Exegesis*. In literature it is rare enough to be able to write in a completely new style, but it must be tougher still to write a good, readable story at the same time. Teller has managed both.

*Exegesis* is written entirely in email format. I was sceptical at first; if most people's emails are like mine, then a book full of brief, badly spelt, one-line exchanges was hardly going to make a good read.

And I have to say that this book was hard to get into. The format is strange, and unlike a book based on an exchange of letters, the next email you read isn't necessarily a reply to the one you've just read. Once the habit of reading the header is established — and you do need to check the date and author — the narrative flows more easily. After that, *Exegesis* becomes almost impossible to put down.

There are only two characters in the book. The first is Alice Lu, a computer-

### This month's top ten books

1	Internet and the World Wide Web: Rough Guide (A. Kennedy)	Penguin	£5.00
2	Windows 95 for Dummies (A. Rathbone)	Transworld	£18.99
3	Excel for Dummies, 2nd Edition	Transworld	£14.99
4	Excel 97 for Windows for Dummies	Transworld	£18.99
5	Design Patterns	Addison-Wesley	£31.50
6	Internet for Dummies (J. Levine)	Transworld	£18.99
7	Essential Client/Server Survivor's Manual (R. Orfali)	Wiley	£27.50
8	Access 97 Exam Prep (Reding)	ITPS	£21.95
9	Teach Yourself Office 97 (G. Perry)	IBD	£17.95
10	Numerical Recipes (W. Press)	CUP	£37.50

● List supplied by Waterstones [www.waterstones.co.uk](http://www.waterstones.co.uk)

program researcher involved in designing software which will search the net and deliver relevant information to its programmer, on its own initiative.

The second character is Edgar, a consciousness that develops out of that initiative — a sort of software soul.

The scenario is actually much more emotive than it sounds, as Teller manages to impart to the reader a very real sense of the characters' personalities: Edgar, as he grows and learns, and Alice, as her world slowly unravels. By the end of the book you



really feel as though you know these two, and that you are a part of their lives. Reading their email borders on the

voyeuristic: as Alice and Edgar share more and more of their deeply personal feelings and go through a few major crises together, you get the overwhelming feeling that you are invading their privacy; yet at the same time, you just can't stop.

Teller scores on three levels with this book. The narrative is written in a highly original format, his characters emerge as three-dimensional people that you care about, and the story itself is gripping. Towards the end, I could barely bring myself to turn the page for fear of what was going to happen next.

Lynley Oram

### Competition winners

■ Here are the winners of our *Which? Guide to the Internet* competition (PCW, February '98). A copy of the book is on its way to them.

Gerald Griffin, Middlesex  
P. Schober, Loughborough  
Michael Camp, Derby  
Clement Umeri, Erith  
D. Arden, London  
Bob Shipley, Bolton  
Andy Young, Gravesend  
A. Horning, Chatham  
Hilary Thompson, Twickenham  
Carol Vile, Wiltshire  
T. Howard, Essex  
P. Smith, Derbyshire  
Gerard Cronin, Dublin  
Keith Robinson, Cirencester  
Vishrut Patel, Peterborough  
M. Peacock, Rugby  
Edward Hands, London  
S. Morris, Middlesex  
Graham Hardy, Shropshire  
W. Lukeman, Mid-Glamorgan  
David Wright, Hampshire  
Alan Gilliland, Co. Down, N. Ireland  
J. Harvey, Hampshire  
B. Wilson, Solihull  
Joanne Ayres, Coventry  
Julian Ding, Kidderminster  
S. Williams, Powys  
Mark Bone, Nottingham  
Anil Chomal, Stockport  
B. Rowland, East Yorkshire

### PCW Details

**HAL's Legacy: 2001's Computer as Dream and Reality**

Editor David G Stork

Publisher The MIT Press

ISBN 0-262-19378-7

Price £16.95

★★★★☆

**A Boy And His Mouse**

Author Jon Casimir

Publisher Allen & Unwin

ISBN 1-86448-602-3

Price £8.99

★★★★☆

**Exegesis**

Publisher Penguin

Author Astro Teller

ISBN 0140 271937

Price £6.99

★★★★★



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*Gordon Laing, Managing Editor*



Over the following four pages we've picked out the outstanding PCs, peripherals and software packages which we can recommend without hesitation. To make it even easier, we've included the current manufacturer's contact number and price, plus details on when and where we

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**Customer Relations Department**  
**VNU Business Publications**  
**VNU House**  
**32 - 34 Broadwick Street**  
**London W1A 2HG**



Anthony George

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**Entry-level PC:** Watford Electronics Aries Multimedia Pro

A decent PC for £599 excluding VAT? Yes, it's possible with Watford's Aries Multimedia Pro. A fairly nifty Cyrix M2 P200 MX processor is accompanied by 32Mb RAM, which is more than sufficient for most tasks. 14in monitors are not normally anything to write home about, but Watford's give a sharp, flicker-free image. *PCW May 1998 p196.*

**Price** £703.82  
**Contact** Watford Electronics  
01582 745555



**Also Recommended**  
■ **Linear Computers**  
**Linear Excel** *PCW May 1998 p195.* **Price** £603.95 **Contact** Linear 0800 622094

**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 an Editor's Choice. *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:** Time 233-2 Professional PC

Just over £1,000 excluding VAT gets you a very respectable PC system these days. In May 1998 Time impressed us with a system consisting of a PII 233MHz processor, 6.4Gb hard disk, 64Mb SDRAM, ATi Xpert@Play graphics card and a decent 15in monitor. Throw in a good bundle of software and you've got a great PC. *PCW May 1998 p206*

**Price** £1,254 **Contact** Time 0800 771107



**Also Recommended**  
■ **KT Computers**  
**Vision PII266 AGP** *PCW May 1998 p218.* **Price** £1,620.33  
**Contact** KT  
0181 961 8897

**Mid-range notebook:** Toshiba Satellite Pro 440CDT

Toshiba thoroughly deserves the reputation it has as a manufacturer of quality notebooks and the Satellite Pro is no exception, winning a Highly Commended award in our March issue. It is a good performer, despite its modest spec of P150 processor and 16Mb of RAM, but most importantly of all, it's very well built. *PCW March 1998 p183.*

**Price** £2,226.63  
**Contact** Toshiba  
01932 828828



**High-end PC:** HP Vectra VL

For a truly high-end PC, look no further than one based on Intel's latest and fastest Pentium II processor, the 400MHz. Not only a fast mover internally, it also fits in the new BX chipset motherboards which run your cards and memory 50 percent faster than before. HP's Vectra VL 400MHz system caught our eye before it flew off. *PCW June 1998 p216.*

**Price** £2,353.53  
**Contact** HP  
0990 474747



**Also Recommended**  
■ **Carrera Power**  
**Pro II** *PCW June 1998 p212.* **Price** £3,049.13  
**Contact** Carrera 0171 830 0486

**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



**Colour inkjet: Canon BJC-80**

Winning Editor's Choice in our last inkjet-printer group test, Canon's BJC-80 didn't fail to impress. Around half the size of a notebook, it's as happy on a desktop as it is on the move, with optional battery and wireless infrared operation. Canon even offers a cartridge with a tiny (albeit slow) built-in scanner, offering still greater flexibility.

*PCW January 1998 p147.*

**Price** £233.83

**Contact** Canon 0121 680 8062

**Also Recommended**

■ **Canon BJC-4650** *PCW April 1998 p80.*

**Price** £327.83 **Contact** Canon 0121 680 8062

■ **HP DeskJet 720c** *PCW March 1998 p82.*

**Price** £270.25 **Contact** HP 0990 474747

**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

**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

**Also Recommended**

■ **Canon MultiPASS MPC20**

*PCW January 1998 p78.*

**Price** £370.13 **Contact** Canon 0181 773 3173

**Colour photo printer: Epson Stylus Photo**

Specifically designed for printing photographic images although more than acceptable at text and business graphics, Epson's Stylus Photo is an undeniably impressive device. In addition to the standard CMYK cartridge, the Stylus Photo employs additional light cyan and light magenta ink, giving truly photorealistic output.

*PCW September 1997 p145.*

**Price** £233.83

**Contact** Epson 01442 61144

**Also Recommended**

■ **Alps MD-2300 Masterpiece**

*PCW September 1997 p142.* **Price**

£645.08 **Contact** Alps 0800 973405

**Business laser printer: HP LaserJet 4000TN**

King of the laser printer, 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: HP ScanJet 6100C**

The 6100C's software is quick and easy to use, while the bundled slide adapter makes 35mm transparency scanning a breeze. The 6100C is a SCSI device, comes with an interface card, and offers 600dpi optical or 2,400dpi interpolated resolution. It may have a slightly large footprint but offers great value for money.

*PCW May 1998 p154.*

**Price** £708.83

**Contact**  
HP 0990 474747

**Also Recommended**

■ **Umax Astra 610P**

*PCW February 1998 p115.* **Price** £98.70 **Contact** IMC 01344 871329

■ **Microtek Phantom 4800** *PCW February 1998 p113.* **Price** £146.88

**Contact** Midwich Thame 01379 649200



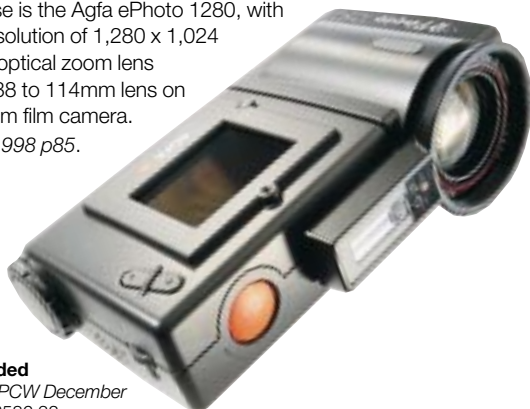
**Digital camera:** Agfa ePhoto 1280

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:** Pace 56 Voice

In our last modem group test there was one clear winner in the category of 56K modems: the Pace 56 Voice. Unlike many of its then competitors, it was designed from the bottom up specifically for 56K, and as a result it beat all other contenders hands down. It is flash upgradable to the full V.90 standard, too.



PCW November 1997 p219.

Price £139

Contact PMC 0990 561001

**Removable storage:** Iomega Zip drive

Let's face it, your hard disk is never big enough and those files you want to copy to a floppy always end up being just over 1.5Mb. Enter removable-cartridge storage devices. We recommend Iomega's almost ubiquitous Zip drive, taking 100Mb disks which cost around a tenner each. Bigger thinkers should turn to the Jaz, below, which stores 1Gb on fast £70 cartridges.

PCW August 1997 p163.

Price £101.05

Contact Iomega  
07000 466342



**Also Recommended**

■ **Iomega Jaz** PCW August 1997 p163. Price £233.83

Contact Iomega  
07000 466342

**Sound card:** Creative Labs AWE 64 Gold

King of sound Creative Labs keeps the crown with its AWE 64 Gold card. It's a lot different from the standard AWE 64, boasting gold-plated RCA jacks, SPDIF digital output, and 4Mb RAM for storing samples. This can be extended to 28Mb, albeit with proprietary memory modules. A fabulous card for games players and musicians alike.

PCW June 1997 p176.

Price £131.54

Contact Creative Labs 01245 265265



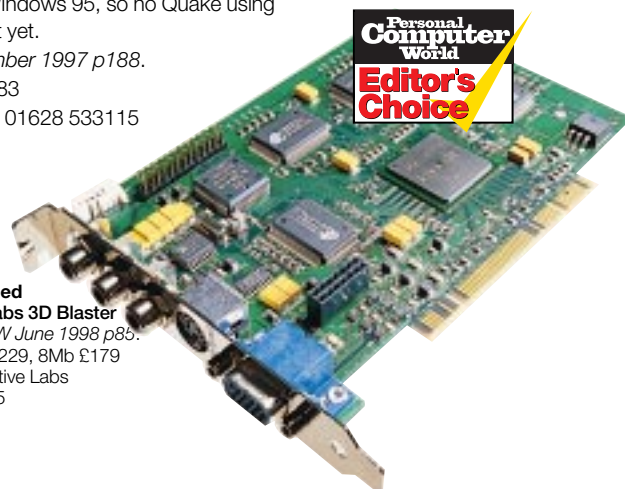
**Graphics card:** ATI Xpert@Play

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



**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 for only £99.95. Those wanting the choice of professional publishers will have to fork out much 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

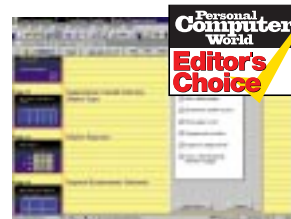
The best personal information manager boasts wide customisability as its greatest strength. For heavyweight contact management, look no further than Goldmine 4 (*details below*). *PCW May 1998 p156. Price* £39.99 **Contact** Starfish 0181 875 4455

**Also Recommended**

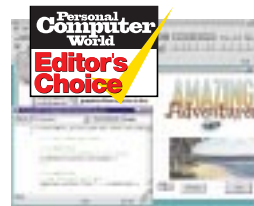
■ **Goldmine 4** *PCW April 98 p88. Price* £229.13 **Contact** AVG 0171 335 2222

**Presentation graphics:** Lotus Freelance 97

Our choice for electronic presentations. The choice 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:** Microsoft 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

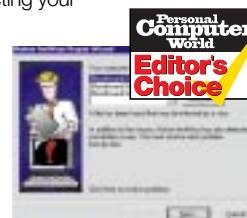
Takes the lead in remote access software. Remote controllers should also consider the legendary LapLink, now on version 7.5. *PCW January 1998 p104. Price* £166.33 **Contact** Symantec 0171 616 5600 ■ **Also Recommended:** LapLink 7.5 *PCW November 1997 p126. Price* £176.25 **Contact** Traveling Software 01753 818282

**Web design:** SoftQuad HotMetal Pro 4.0

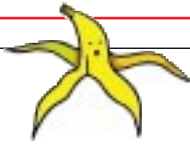
An excellent all-rounder, HotMetal Pro 4 gets our thumbs up for web design. For a slick interface and Office 97 integration, Microsoft's FrontPage 98 is worth a look. *PCW January 1998 p196. Price* £123.38 **Contact** SoftQuad 0181 387 4110 ■ **Also Recommended:** FrontPage 98 *PCW January 1998 p195. 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

Norton's 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 Solomons 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



## Oops!

- The Aries PC featured twice in the Final Reality results chart on page 199 of the May issue. The higher results are the true ones, and the bottom results are for the Extreme Ultimate Pro PC.
- We printed the incorrect web address for free internet provider X-Stream Technologies (p26, May issue). It should have read [www.x-stream.com](http://www.x-stream.com).
- On page 153, in First Impressions, we stated that the Hercules Thriller 3D graphics card has to be used in conjunction with a 2D card. It is actually a standalone 2D/3D card which does not require the presence of another card.

## Cheese is answer to millennium problem

Top IT analyst, Deloitte Dtameetcha, is urging firms to look to Europe for the answer to their Year 2000 problems. According to the specialist consultancy firm, we can all take a leaf out of the Dutch cheese growers' book. "Edam is made backwards," says top curdsmith, Joost Aminute. "It is this kind of reverse engineering that the IT industry needs to embrace."

## Twist in the tale

Bubbles, a charming five-year-old springer spaniel from Bridport, Dorset, went to collect her owner's mail from the letterbox as usual but was taken unawares by the first issue of a new *PCW* subscription. The weighty tome pinned the bewildered hound to the floor... just as a freak whirlwind, a.k.a. twister, took hold of the house. Both postie and dog owner were whisked away by the devilish tornado, but the terrified mutt, anchored by the admirably solid *PCW*, survived to bark the tale. The ballast-less humans were last spotted over Portland Bill, heading towards France.

ChipChat wishes them the best of luck, and is in talks with the *PCW* subscriptions department as to the viability of pigeon-convoy delivery, using some kind of net apparatus attached to helium-filled balloons.

## Caption competition

Centre child: "That reminds me, the FA Cup final is on Saturday."

Think you can do better? Send your hilarious caption on a postcard, marked June Caption Competition, to the usual *PCW* address (page 10) or send an email to:



[captions@vnu.co.uk](mailto:captions@vnu.co.uk). We'll print the winning entry and bestow a £20 book token on the creative genius responsible.

**Left** Congratulations to April's winner, Mike Baldock, who came up with the following caption: "Only minor oral surgery is needed to achieve astonishingly accurate results with our leading-edge speech recognition software."

## Man sues Microsoft after biting own head off

No, not really.

## Blood from a stone

Top-secret papers giving details of extraordinary human experimentation have been leaked to ChipChat. Following last month's bumper 20th anniversary issue, a bundle of documents purporting to be from the Ministry of Offence arrived on the doorstep. Close examination points to the ancient Sinclair ZX81 computer having been developed as a spin-off from research into getting blood from a stone, back in the early seventies.

Attempts to extract



the life-giving liquor from Mick Jagger, Keith Richards and Charlie Watts proved fruitless. A yield of around 50ml per day from Ronnie Wood was cause for satisfaction but not unexpected — scientists had successfully leached blood from a Sussex copse in late '71.

The ramifications for the computing industry are unclear at this time, but rest assured ChipChat will keep you informed of all major developments.

## Naming names

The International Standards Association has begun the immense task of renaming all confusing computer acronyms. The agreement, finally hammered out at a special meeting in Copenhagen last month, will provide a simple, unified set of terms which everyone can understand.

The first changes will affect "byte" and "bit", the fundamental building blocks of computer code. Byte will become "bite" and bit will be changed to "Jonathan", although "Jonners" may be authorised as and when programmers become more intimate with their code.