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Personal Computer World

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VNU Business Publications

BUMPER CHRISTMAS ISSUE 900+ PAGES



CHRISTMAS
SHOPPING LIST
✓ Home PCs
✓ Colour Printers
✓ Digital Cameras
✓ This year's top
games & software

If your CD-ROMs are missing please ask your newsagent
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WIN
2 Canon printers
A Compaq server worth £3,400
10 3D graphics cards

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VNU BUSINESS PUBLICATIONS

Editorial

It may say January 1998 on the cover, but this is most certainly our Christmas issue. It's safe to say that a great number of people will be unwrapping computer

equipment of some description on The Big Day. For many, it will be their first PC.

It was back in the early eighties when I unwrapped my first PC — well, a Sinclair ZX81. I remember it all clearly. It may have resembled a desk calculator and been dwarfed by the family TV, but I loved it.



The following year I got my first Sinclair ZX Spectrum and experienced the worst Christmas nightmare: dead on arrival. Yes, the curse of the broken PC that still strikes today. When the shops re-opened, it appeared that I was not alone, as scores of stressed parents with moody kids thrust their useless boxes onto the counter for a replacement. I ended up getting through no less than four of these “doorstops” over the period of one month, and there lies a lesson for us all: if you're buying electrical equipment for Christmas, make sure it works before wrapping it up. And don't forget the batteries!

However feeble some of the early home PCs may have been, they captured the hearts and imaginations of countless enthusiasts, including myself. At an early age, the seed had been sown and my life changed forever. I suspect there'll be more joining the ranks this month, captivated by their new purchase.

The appeal has never been stronger. For me, the most remarkable thing about how computers have changed over the past 20 years is not the drop in price or increase in performance, but what we can do with them. Photo retouching, sound and video editing, desktop publishing, the best games, office applications and communications are now possible on today's PCs.

Probably the single most important development since the early home computers has been PCs with their own displays. I'm sure my family wasn't the only one frequently brought close to break-up because someone desperately needed to use their computer via the TV just as Coronation Street started.

Merry Christmas and a Happy New Year!

Gordon Laing
Acting Editor

Next Month

NT Workstation PC group test

New year, new budget. Nik Rawlinson looks at ten networkable, 300MHz Pentium II high-end workstations to see what's hot, what's not, and what's to be got.



Budget laser printers

Smaller, faster, cheaper: we test the latest low-cost lasers.



Year 2000

The end of the century is nigh! Find out if your PC will survive the millennium, and what to do if it won't.

Plus... Scanner update

It's true! Decent colour flatbeds for less than £200.



February '98 issue

■ On sale Saturday 27th December

* Next month's contents subject to change.

January Cover disc

■ 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 will get better performance if not too many other applications are running). Put the disc into your CD drive.

- **Win95:** If you've got Win95, the PCW interactive loader will appear on your screen. If your CD doesn't autoloading, go to **Start/Run** and type in `<CD Drive>:\pcw.exe`.
- **Win 3.1:** From Windows Program Manager choose **File/Run**, type in `<CD Drive>:\pcw.exe` and press enter.

■ System requirements

A PC with Win 3.1 or later and a colour VGA display. For best results, run on a Pentium PC with at least 16Mb of memory.

■ Possible CD-ROM problems

The technical helpline on **0891 715929** is open weekdays from 10:30am to 12:30pm, and 1.30pm to 4:30pm. Calls cost 50p per minute. If you experience problems with the CD-ROM, such as a message "Cannot read from drive D:", please return the disc with a covering note bearing your name and address and clearly marked "PCW CD January 98" to: TIB, TIB House, 11 Edward Street, Bradford BD4 7BH.

■ Featured applications

• Microsoft Project 98 (Win95 only)

Effective project management: Whether you're overseeing simple short-term projects or managing complex multi-project schedules, you can remain in control.

Run **SETUP.EXE** from the directory:
`<CD-DRIVE>:\SOFTWARE\FEATURED\APPLIC\PROJECT\`

• Yamaha Software Synthesisers (Win95)

This collection includes the full versions, which can be used after contacting Yamaha. See CONTACT INFO on the CD.

Run **YAMAHA.EXE** from the directory:
`<CD-DRIVE>:\SOFTWARE\FEATURED\APPLIC\YAMAHA\`

• i publish 2 (Win95)

Includes layouts for print, web and on-screen delivery. The layouts determine

characteristics such as placement and sizing of text and pictures.

Run **SETUP.EXE** from the directory:

`<CD-DRIVE>:\SOFTWARE\FEATURED\APPLIC\IPUBLISH\`

• FastForms 3

The main component of FastForms is the Form Designer, enabling you to create and manipulate forms — e.g. HTML and application forms, invoices, printed records.

Run **SETUP.EXE** from the directory:
`<CD-DRIVE>:\SOFTWARE\FEATURED\APPLIC\FASTFORM\`

■ Featured games

• Tomb Raider II (Win95)

Tomb Raider II combines the classic gameplay of Tomb Raider with new moves, weapons, puzzles and more!

Run **TOMB2.EXE** from the directory:
`<CD-DRIVE>:\TOMB2\`

• Dark Forces II Jedi Knights (Win95)

Jedi Knights continues the story of Katarn as he embarks on a quest into his past and learns the ways of the Jedi.



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 to your data or your computer system which may occur while using either the disc or any software contained on it. If you do not agree with these conditions, you should not use the disc. It is good practice to run a virus checker on any new software before 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 that it may be restricted in some way — for example, it may be time-limited or have certain functions disabled.

Run **JEDIDEMO.EXE** from the directory:
`<CD-DRIVE>:\SOFTWARE\FEATURED\GAMES\DARKFORC\`

• Turok: Dinosaur Hunter (Win95)

Turok: Dinosaur Hunter is the Windows 95 3Dfx demo of this previously exclusive Nintendo 64 game.

Run **TUROK3DF.EXE** from the directory:
`<CD-DRIVE>:\SOFTWARE\FEATURED\GAMES\TUROK\`

Canterbury Classics Competition: 25 CDs to be won

The Canterbury Classic Interactive CD Catalogue on this month's CD is a regular feature on *Classic fM Magazine's* free cover-mounted CDEExtra. This month's catalogue features ten new CDs from the brand-new mid-price classical label by Classic fM and BMG Conifer, which aims to bring new recordings of complete classical works (by established world-class performers, and young up-and-coming artists) to a new and wider audience. To celebrate the successful launch of their new label this winter, Classic fM and BMG Conifer are offering 25 lucky readers the chance to win a free copy of one of their CDs, and 25 runners-up can each win a free copy of their CD sampler. The prizes are worth over £300 in total! To enter, just answer these questions:

1. Which track, from the ten new Classic fM / BMG Conifer CDs, is featured on this month's PCW CD-ROM?
2. Is this statement true or false? — *The CD sampler of Classic fM / BMG Conifer's new classical record label includes excerpts from all of the first ten CDs released on the label.*
3. If you were to be one of the lucky prize-winners in this competition, which of the ten new Classic fM / BMG Conifer CDs would you choose as your prize?

• **Send your answers, on a postcard, to: Classic fM/BMG Competition, 35 St Peters Grove, Canterbury CT1 2DJ. Winners will be selected at random from all entrants who answer these questions correctly. Closing date: 31/01/98.**

Rules of entry: This competition is open only to readers of Personal Computer World, except employees (and their families) of VNU Business Publications, Classic fM and BMG Conifer.

PSION COMPETITION

On this month's CD-ROM, there is an opportunity to win one of the awesome, award-winning, new Psion Series 5 machines. Crack the ingenious graphic puzzle that Psion has created to tax your logic problem-solving skills. The puzzle requires QuickTime for Windows and can be found in the Games section of the Software Library. To find out where to send your competition entry, complete the puzzle and you will be given an email address.



Above Zoom into town with InfoMap



Right Jedi Knights

• Microsoft Close Combat II: A Bridge Too Far (Win95)

Close Combat is a WWII strategy game that offers psychological profiles, continuous (real-time) action, authentic historical scenarios and multi-player functionality.

Run **MSABTF.EXE** from the directory:
<CD-DRIVE>:\SOFTWARE\FEATURED\GAMES\COMBAT

■ Featured multimedia

• InfoMap 4.0

Zoom into a vector-based map of London (or the rest of the UK in less detail).

Run **SETUP.EXE** from the directory:
<CD-DRIVE>:\SOFTWARE\FEATURED\MULTI\INFOMAP

Wanted: Material for PCW cover CD-ROMs

We are always on the look-out for material for our cover-mounted CD-ROMs. If you think you have something that might be suitable, such as software, pictures, fonts or demos, please let us know: email Matt Honeyball at matt_honeyball@vnu.co.uk or write to him at CD Development, New Media, VNU Business Publications, VNU House, 32-34 Broadwick Street, London W1A 2HG. *Please note that Matt cannot accept technical support calls.*

January 1998



PCW INTERACTIVE Complete Contents List

FEATURED SOFTWARE :

APPLICATIONS:

MS Project 98, Yamaha Synthesisers, i Publish 2, FastForms 3

GAMES:

Tomb Raider II, Dark Forces II, Jedi Knights, Turok Dinosaur Hunter, Close Combat II: A Bridge Too Far

MULTIMEDIA:

InfoMap 4.0



Personal Computer World

F O L D H E R E

Software Library

- Acrobat Reader
- Callcheck
- D-Noise
- Datapict
- Desktop Lawyer
- DirectX 5.0
- Easyphoto
- Exile II: Crystal Souls
- Exile: Escape from the Pit
- Gazillionaire Intergalactic
- Inside Information
- Internet Explorer 3
- Internet Explorer 4
- JPEG Optimiser
- Mind Your Own Business
- MusicPage
- Netscape 4.03
- Norton Anti Virus
- PaintShop Pro
- Phone Monitor
- PKZIP
- Psion Puzzle
- Real Audio Player
- SmartMail
- Space Monitor
- Video for Windows
- Video Works
- Wincode
- Winzip 3.1/95

- PDF file reader
- International dial code finder
- Adobe premiere filter
- Handy icon/clipart/font converter
- Legal document creator
- Windows graphics driver
- Image gallery editor
- Cool role-playing game
- Great role-playing game
- Wheeling & dealing
- Searchable product database
- Win 3.1 internet browser
- Internet browser
- JPEG converter
- Home accountancy
- Net sheet-music retrieval program
- Netscape's newest net browser
- Virus checker/killer
- Image editor
- Internet call logger
- File compression utility
- A chance to win a Psion
- It's audio for real!
- Clever email package
- Drive space utility
- Windows video drivers and player
- Video editing software
- Multi-purpose encoder/decoder for Windows
- Windows file compression/decompression

FastForms competition



Let your imagination run riot and take the tedium out of form design by producing some fantastic-looking forms. Try drop shadows, or rounded corners as variants on the usual boxes and fields. Colour brightens things up, and fancy fonts and pictures can bring a form to life.

FastForms lets you add text fields so that your form can be printed and hand-filled, or filled separately in the form filler application, or linked to database fields so that form data can be held within the FastForms database, letting you control your data. You can create and maintain computerised lists and records like customer lists and current stock records, print address labels and reports, and produce random samples of a database for test mailings.

The pull-down choice lists and checkboxes enhance a form and make it easier to complete. FastForms also has an excellent facility to perform calculations within a form (even complicated spreadsheet functions), saving time for the filler and reducing the scope for errors. For those familiar with the net, forms can be saved in HTML format and incorporated into your web pages.

Once you start using FastForms, you'll never look back. FastForms takes the pain out of an otherwise daunting task, saves you time and money, and helps you produce professional, attractive, personalised forms for all sorts of uses. Start designing those fab forms and a PC or a copy of FastForms could be yours!

** Eagle PC: P100MHz, 1.2Gb hard disk, 16-speed CD-ROM, graphics card, sound card, 80W speakers.*

Maybe forms aren't the most exciting things to create, but we all use them — in business they're a necessity. The vital art of form design need not be boring, using FastForms 3. Try it for yourself: there's a timed trial version of the software on this month's cover disc. In no time at all, you could be producing professional and attractive forms.

You'll love using such a simple and effective tool as FastForms, and as an extra incentive to get you using the software, Toplevel is offering *PCW* readers an exclusive chance to win a free **Eagle PC*** for the best form which has been designed using

FastForms. Plus, 20 runners-up will each receive a copy of **FastForms 3**.

FastForms comes with an on-screen tutorial if you need help getting started, or begin by experimenting with the layout and look of one of our forms from the library of ready-made

examples (we may even include yours in a future version, if it's good enough). Or, of course, you can start from scratch.



How to enter

Send your form, together with your name, address and a daytime telephone number, to: Toplevel Computing, Bath Road Trading Estate, Stroud GL5 3QF. Entries must arrive by 30th January 1998.

Rules of entry

This competition is open to readers of *Personal Computer World*, except for employees and their families of VNU Business Publications, Toplevel Computing and Eagle. TopLevel directors are the sole judges of the competition and their decision is final. No cash alternative is available in lieu of prizes.

Compton's Interactive Encyclopedia 1997

Free on this month's cover disc we are giving away a full copy of Compton's Interactive Encyclopedia 1997 Edition, from The Learning Company. It is packed with 37,000 articles, 100 full-motion videos, slide shows, animations and presentations, more than 8,000 photographs and nearly 17 hours of sound and music. A dictionary, thesaurus and atlas are included. But if you want to upgrade to the 1998 version, The Learning Company is offering £15 off either of the two new versions, Standard or Deluxe.

No matter what you are looking for, you will find it in Compton's Interactive Encyclopedia: everything from the complicated world of Bosnian politics, to the works of Matisse and Babe Ruth's baseball career, are covered.

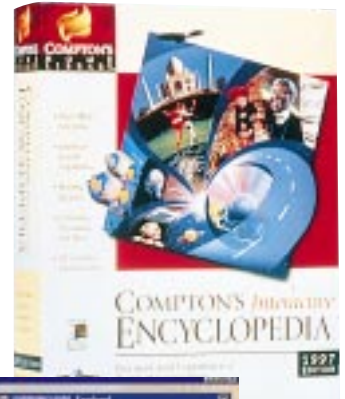
But a multimedia encyclopedia is no good without a search engine, and Compton's excels in this. Its search facility allows you to specify your search with "and", "or" and "not" phrases and the Infolinks feature highlights any related articles. So if you are looking at information on Nelson Mandela, you will find links to articles on the ANC, Apartheid and Johannesburg.

Visual timelines give you the bigger

picture on world and US events, and you can use the interactive atlas to see where these events happened. There are 3D environments, too, which are packed with facts. And when you have researched a topic, using the Present It feature you can create multimedia presentations with video, voiceovers, pictures and sound clips.

But it is not all work and no play. There is a lot of fun to be had, including an

introductory tour of the CD where your guide is none other than actor Patrick Stewart, alias Jean Luc Picard of Star Trek: The Next Generation.



Running the CD

To run the CD you will need:

- 486DX2/66MHz or better
- 8Mb RAM (16Mb recommended)
- Hard disk with 70Mb available
- 256-colour SVGA
- Double-speed CD-ROM drive
- Windows 95 or Windows 3.1
- Windows compatible sound card
- Mouse

SPECIAL READER OFFER

The 1998 update of Compton's Interactive Encyclopedia has just been released in two separate versions: Standard and Deluxe. The Standard version is fully updated and expanded, while the Deluxe version comes on two CDs and includes the content from a complete 26-volume encyclopaedia. Both have free monthly online updates to keep your encyclopaedia bang up to date. The Learning Company is offering £15 off the price of both of these titles to PCW readers.

Standard version: Special discount price £24.99 (normally £39.99)

Deluxe version: Special discount price £34.99 (normally £49.99)

Both versions will be shipped in a jewel case.

Order Hotline 0800 371305

Borland Delphi Special PCW reader offers

If you want to create software that is fast to develop and speedy to run, Delphi is the best solution. We've got together with Borland to offer *PCW* readers exclusive opportunities to buy the latest versions of Delphi at savings up to 75 percent off! Delphi 2 Developer and the latest Delphi 3 Professional edition, complete with rights to deploy applications are available at very special discounted prices. See opposite page for full details.

Delphi's visual design environment lets you create sophisticated Windows applications faster than any other development tool. Because Delphi is built around an optimising native code compiler, Delphi applications are between ten to 20 times faster than interpreted code.

Delphi delivers three of the key features most sought-after by today's developers:

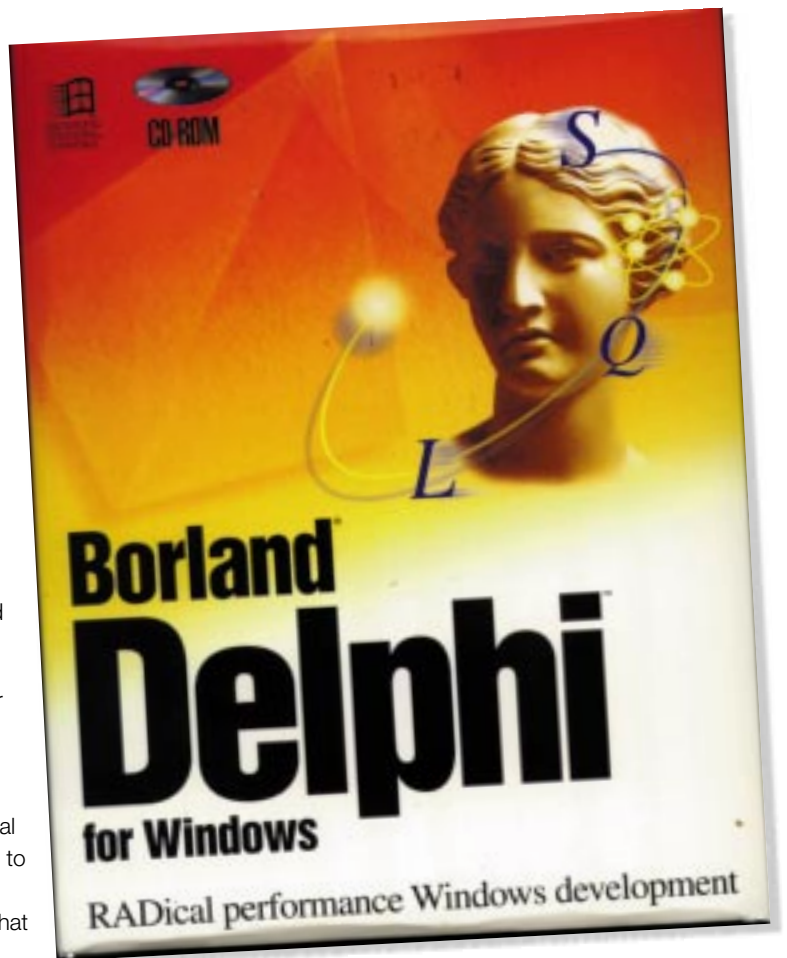
1. Rapid development: On the surface, Delphi looks a lot like Visual Basic. Add a form, pop on a control or two, double-click a button to add a few lines of code, click Run and away it goes.
2. Native code compilation: Delphi compiles to true executables that potentially run as fast as applications created in C or C++.
3. Object orientation: Delphi supports classes with constructors and destructors, inheritance, encapsulation and polymorphism — all the essential characteristics of an object-orientated language.

You can also program procedurally in Delphi. You get the best of both worlds: Delphi is easy to learn if you are familiar with Visual Basic or xBase, but all the benefits of objects are available, too.

Delphi integrates the Borland Database Engine, so you have instant support for dBase, Paradox, and ODBC local databases.

System requirements for Delphi 1 on last month's CD

- Delphi requires Windows 95, 3.1 or a 100 percent compatible operating system, an 80386 or newer processor (486 recommended) and 6Mb of system memory. A minimum installation requires approximately 30Mb of disk space.
- DCC.EXE, the DOS command-line compiler, requires at least 1Mb of extended memory.
- Delphi has been tested under Windows 95, Windows 3.1, Windows for Workgroups 3.11, Windows NT 3.5 and OS/2 Warp.



It includes the Local InterBase Server so you can create standalone client/server applications with a high-performance ANSI SQL-92 compatible database server.

Also included is Borland's award-winning ReportSmith report writing tool, which allows programmers to prepare innovative reports using live data in all popular database formats.

For more information, browse the Delphi web site at www.borland.com

Limited licence offered through *PCW* on last month's free Delphi CD

- This software can only be installed onto a PC once. It is not shareware.
- Applications developed using the software may not be deployed.
- The software is for personal use only by software developers and may not be used for development or teaching in a commercial or educational establishment.
- Programs and applications that have been constructed with the software may not be distributed. The software is provided only with the aim of allowing the owner to learn the use of this software. For distribution rights of owner-generated applications, the owner will have to purchase a copy of additional software or a package designed for this purpose.
- No resale of the CD is permitted. No free support is available with this CD. Full licence details on the CD.



Special offers

Learn to program with Delphi: £29.95 + VAT (normally £42.51+ VAT)

Includes limited edition of Delphi 1.0 (full software, but no option to deploy applications) and includes a full online curriculum and tutorial as well as the acclaimed book, *Learn Delphi in 21 Days*.

Delphi 2.0 Developer: £99.95 + VAT (was £399 + VAT)

Lowest price ever! Includes full Delphi 2.0 Professional for Windows 95 and Windows NT, with full printed manuals and rights to deploy applications. Also includes Delphi 1.0 with rights to deploy applications.

Delphi 3.0 Professional: £249 + VAT (normally £399 + VAT)

The very latest in Delphi technology, along with the rights to distribute applications. Delphi code can be used anywhere that ActiveX is supported, including Microsoft Office and Internet Explorer. The Delphi 3.0 environment is much improved, too, with handy auto-coding features and an impressive set of wizards. Database connectivity now includes Access MDB data and FoxPro's style of memo and index files, in both cases without requiring ODBC. Overall, Delphi is the best Windows development tool.

Order Hotline 0800 454065

Call our telephone hotline and quote reference **PCW2**, or complete the coupon and send it to:
PCW Offer, Borland Information Centre, PO Box 527, London EC2B 2ZA

Description	Item	Price per item	Quantity	Total price
PCW02	Learn to program with Delphi	£35.19 (inc VAT)		
PCW03	Delphi 2 Developer	£117.44 (inc VAT)		
PCW04	Delphi 3 Professional	£292.58 (inc VAT)		

Postage & packing: £8.31 (inc VAT) __

Total of order: £ _____

Name: _____

Address: _____

Note, all prices on this form include VAT at 17.5 percent

I enclose a cheque/postal order for £ _____ payable to **Borland International (UK) Ltd**

OR please charge my Mastercard Visa Switch

Credit card no.

Expiry date _____ Issue No (Switch only)

Signature _____ Date _____

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Daytime telephone: _____

• Please tick box if you do not want to receive promotional material from other companies.
Coupon code 21-01-98

• Please allow 28 days for delivery

Newsprint

APOLOGIES!

...to those of you who have had trouble accessing our web site. The problems, sadly, have been beyond our control. The good news is that the site is being revamped and will become bigger and better over the coming weeks. By way of compensation we present, with this issue, a...

COMDEX WEB SPECIAL REPORT

Following a long and hallowed tradition, the 1997 Fall Comdex is timed to miss monthly magazine deadlines. This is a plot to avoid publicity — but we have an answer. We will post on our site a special report from Clive Akass in Las Vegas on the latest and greatest at the world's top computer show. Log in now at www.pcw.co.uk

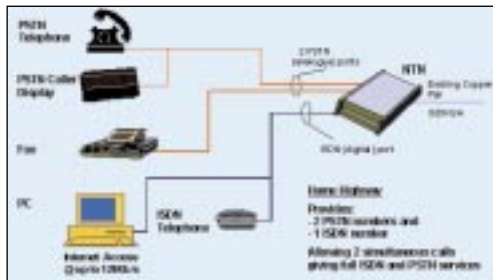
Past, Christmas present, and future

CDs have never had the capacity to exploit multimedia fully, so it will be exciting to see what designers do with DVD-ROM. Wonderful stuff, if a new work called Discoveries is anything to go by. Published as a companion to the IBM World Book, it's an Anglicisation of a prizewinning Larousse history of the earth from the Big Bang. It combines the advantages of speech and text, because every word is spoken. We'll tell you more soon in a review, but meanwhile, at £59.99 for a five-CD set, it would make a great Christmas present. Or wait for the DVD in the new year. **DVD-RAM split...page 46**

New fast link heralds end of line for audio modems

British Telecom may offer a cut-price hybrid ISDN data service to homes as soon as next summer, in a move that could make audio modems obsolete.

The Home Highway service,



offering data rates up to 128 Kbps, will start trials in February and could go on general offer three months later.

It uses a modem-style box which plugs into BT's main socket in the home and offers four lines: two analogue ports and one two-line ISDN port.

Only two of these can be used at a time, so you can use your old analogue equipment on one line if you wish. You also

get two new numbers, making three in all.

BT will not say how much the service will cost, except that it will be cheaper than ISDN. High ISDN pricing, which has been blamed on old strategic mistakes by BT, has extended the market life of audio modems to the point of farce, as increasingly sophisticated ways are found to push data past antique and patently redundant

analogue bottlenecks.

BT has been saying for years that ISDN installation costs are impossible to cut. So how is it that a more complex hybrid system can be cheaper?

John Dunbar, marketing manager for Ericsson, which makes the new home unit, said it was because ISDN is usually added to an existing analogue service and therefore requires an extra line. "Home

Highway allows both on a single copper cable. You don't need a new line." The unit also allows users to retain analogue services such as Caller Line Identification (CLI) which are lost on the analogue ports of many ISDN cards, says Dunbar.

Modem makers have been preparing devices for an eventual switch to all-digital comms, but they still face a shake-up.

Rockwell, which makes the chips for most modems sold, chose last month to announce a cheaper alternative to Asymmetric Digital Subscriber Line. ADSL offers a way of getting up to 6Mbit/sec through standard BT lines by piggy-backing a high-frequency signal. But it would require massive investment by BT.

BT has run one successful ADSL trial, and has asked service and content providers to take part in another next year. A

● *Continued on page 26*



Microsoft court battles

■ The US Department of Justice threatens to fine Microsoft \$1 million a day for bundling IE4.0 with Win98, which it says violates a 1995 "consent decree" banning software shipments being tied to OS licences. Meanwhile, Microsoft has filed a countersuit against Sun, which is suing it over its Java code. **See People, page 32**

Cheap Alpha PCs coming

■ Intel is paying \$700 million for Digital's chip plants as part of a deal to settle a potentially devastating patent dispute. And Samsung plans NT-ready sub-\$3,000 PCs based on 600MHz Digital Alpha chips for late 1998.

News edited by Clive Akass: news@vnu.co.uk. Net news edited by Adam Evans: adam_evans@vnu.co.uk

Computers big and small shape up for the future



Pressure for a change in the shape of the end-of-century computer is coming from three directions at once.

The increasing power of handhelds is challenging notebooks for the mobile market. This has renewed interest in the sub-notebook format as a way of flogging expensive machines to users who want true mobiles.

And notebooks are taking the place of the sit-up-and-beg

desktop. AJP has launched a 4.7kg notebook (*below*) with a biggest-*yet* 15.1in colour TFT screen, equivalent to a 17in CRT, which the company does not try to pass off as portable.

It has a full-size keyboard, with a numerical keypad, and a footprint of 35.7 x 27.5cm compared to the 30.4 x 24cm of the typical notebook. It will cost less than £2,500: cheap for a screen of this size. "We see it as a desktop machine that is moved only perhaps for the occasional presentation," said AJP marketing manager Angela Parmar.

Vendors in London for the launch of Windows CE 2.0 (*see right*) showed off the latest batch of handhelds, including two with colour screens which will not be available until 1998. Most

luxurious was Hewlett-Packard's 620LX, with a 256-colour 640 x 240 screen, 10Mb

ROM and 16Mb RAM, and web, ethernet and fax capability.

Sharp's colour HC-4500A comes with 8Mb of RAM but a similar-sized colour screen. A mono version, the HC 4100 (*top right*) is available now.

Dell, Hitachi and Toshiba all have new sub-notebooks on the launchpad in the US. Toshiba's is a Network Computer and will sell at first only in Japan; Toshiba is also upgrading its tiny Libretto.

The Hitachi, with an 8.4in colour screen and a 233MHz Pentium processor, will sell for about \$3,500. It remains to be seen whether machines at that price can compete with cheaper "baghelds" that will surely emerge from the current crop of PDAs.

Hitachi 01628 585335;

Dell 01344 720000; Toshiba

01932 852455; AJP 0181 452 9090;

Sharp 0161 205 2333



CE 2.0 launched

Microsoft last month launched the new version of its handheld operating system. Improvements in Windows CE 2.0 include support for TrueType fonts, better synchronisation, ethernet security, support for email attachments and a pocket version of PowerPoint for mini presentations. Vendors of some first-generation CE machines are offering ROM upgrades to CE 2.0. Details are at www.microsoft.com/windowsce/hpc/ Microsoft 0345 002000

Business help

The government has set a site at www.openm.gov.uk/gdirect with more than 600 forms and guidance papers to help small businesses cope with everything from tax returns to maternity leave.



USB hub

Northstar has launched a four-port USB hub.

Details are at www.northstar1.com

Lots of fun

Morgan's has launched an online computer auction at www.morgan-auctions.co.uk

Lamb Screen Toy

The cover CDs for the November issues of *Personal Computer World* and *What PC?* and *Software* contained a program entitled Lamb Screen Toy. VNU has been informed that this is commercial software and not available for free use. Please do not download this program onto your system and, if you have, please delete it. Copies of this software may be obtained from Village Centre at www.villagecenter.co.jp/english/poe.html

p26 >

Search engines cash in on the sex starved

Someone asks for sex on the Snet once every two seconds. It is the word most commonly entered in search engines, with more than 1.5 million requests a month, according to a survey by *The Web* magazine in the US.

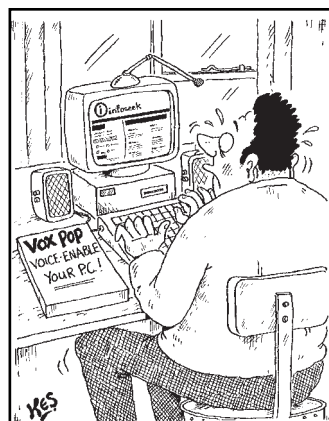
The rest of the top ten were Chat, XXX, Playboy, Netscape Software, Nude, Porno, Games, Weather and Penthouse.

Search engines like Infoseek are unabashedly cashing in on the demand by placing porn ads on sex-site listings. The UK Plus

engine, an Infoseek associate and stablemate of the moralising *Daily Mail*, objected vociferously in April when Newsprint pointed out, tongue in cheek, that it was being used as a conduit for porn.

Its UK pages are squeaky clean (and rather good) but its world links, porn and all, come from Infoseek, albeit minus paid-for porn ads.

An on-site policy statement says UK Plus tries to exclude offensive sites but "due to the unregulated nature of the internet" can accept no responsibility for content.



"User... Can you please stop using that foul language?"

Pentium II price cuts too late for Christmas buyers

Intel will cut Pentium II prices in January, prompting questions about its Christmas pricing policy. The move will position PIIs as entry level just three weeks after the seasonal buying spree, a source from Intel said.

Intel came under fire early this year when it launched MMX processors, rendering Christmas machines out of date just

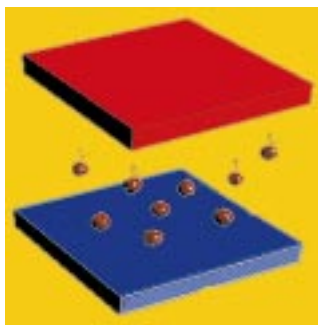
weeks after purchase. The source said there will be another price shift in April as part of a plan to "ramp the PII" into the entry level of the marketplace.

Intel will sell MMX chips for three months next year, after which sales will tail off as the ceramic processor becomes obsolete.

The source added that Intel is set to

introduce a PII processor in a scaled down format which will fit into NetPCs. The idea is to ensure that Intel can deliver the form-factor PC manufacturers want to compete with the NC platform. An Intel representative said the company was unable to comment on its future plans.

Mike Magee, VNU Newswire



Cool way to use an old technology

Readers of a certain age may recognise the above diagram with a frisson of nostalgia. It shows the process which drove the first devices of the electronic age, including early computers, and which is still used in the cathode ray tube of your PC.

It is, of course, thermionic emission. Electrons constantly spill like evaporating water from the surface of a metal. By putting a positive electrode nearby to attract them, and setting the whole caboodle in a vacuum, you can generate a flow of current.

This flows only one way, hence the term thermionic valve. Tiny voltage changes on grids set between the electrodes produced huge changes in the flow, producing the first amplifiers.

In practice the electron source, or cathode, is usually heated to give electrons more energy. This masks a side effect of thermionic emission which is only now being exploited: only the most energetic electrons spill out, so there is a cooling effect.

A company called Borealis has brought out a solid-state diode, using new high-emission material, which pumps heat from the cathode to the anode.

It claims that arrays of these devices can be used as ecologically impeccable cooling on virtually any scale. But a major application would be to cool computer chips. Full details are at www.borealis.com

Clive Akass

Manufacturers hedge their bets on Microsoft's NetPC

Manufacturers are holding back from making dedicated Net PCs, Microsoft's answer to the Network Computer.

A NetPC is essentially a sealed PC with no expansion slots or floppy drive, and a BIOS primed for remote administration. Unlike an

NC (as presently specified) it has a hard disk. The idea is to give a PC the security and ease of maintenance of an NC.

Doing without slots entails creating a new motherboard, which vendors are loth to invest in. Tulip, IBM and Compaq all offer designs based on standard PC

boards and boxes with blocked floppy bays.

Tulip's Peter Van Leuwin said

it was hard to invest in a product for which there is uncertain demand. Tulip is demonstrating its NetPCs with beta software as Microsoft has been slow to deliver its Zero Administration for Windows. IBM offers its LanClient Control Manager (LCCM) which lets you wake up PCs and install BIOS changes and operating systems remotely. Download LCCM, which works on compliant non-IBM PCs, from www.pc.ibm.com/desktop/lccm Tulip 01293 420200



Soyo claims this SY-5ED5/M motherboard is the first to marry Intel's Accelerated Graphics Port (AGP) to Socket 7 processors, enabling speeds of up to 266MHz. Soyo 0181 481 9720

Tulip revives Commodore

Commodore PCs will be back in shops in the new year following Dutch-owned Tulip's takeover of the troubled firm. They will be targeted at a lower end of the market than Tulip's own brand. Sales of 100,000 in the first year were predicted by Tulip founder Franz Hertenaur at his new highly-automated plant which is set up for Dell-style manufacture-to-order. Tulip 01293 420200

End of line for the audio modem?

Continued from page 24

spokesman said: "BT wants to find out what services are likely to use ADSL now."

Rockwell says its Consumer Digital Subscriber Line is cheaper because no equipment needs to be installed at the user end. But it is significantly slower, offering just 1Mbit/sec.

Dataquest comms analyst, Sue Thomson, said: "CDSL could offer BT big savings." But

she pointed out that BT "is not going to change quickly unless it is forced to do so by competition." The competition is hotting up. Fast data broadcasting next year will force the hands of land-line providers. Last month, Nortel announced a scheme to provide a permanent 1Mbit/sec link over the mains.

Clive Akass

Modems double up, page 41

Lotus hits the Java suite spot

Lotus launched a suite of Java office apps last month in what looks like the first serious challenge to the current fashion for massive do-it-all applications.

Lotus eSuite, codenamed Kona, will have little impact in the short term. But it is well placed to become the powerhouse for Network Computers, which rely on trim, downloaded applets.

The web *lingua franca*, HTML, is used as a file

format and the suite will run on any Java Virtual Machine.

It consists of a customisable environment called WorkPlace, with basic office applets, a browser and facilities for connecting to IBM mainframes (IBM, of course, owns Lotus).

It will ship early next year in the US for \$49 a seat, or \$1,495 for a server version with unlimited users. Two rival Java suites from Corel and Oracle have been



delayed. In fact, Oracle subsidiary NCI has licensed eSuite for its NC, and even Oracle is offering it as an option with its INterOffice groupware product.

The UK Java Users Forum said eSuite will be welcomed by companies facing high licensing costs for suites. It said in a statement: "This presents the first step towards a viable NC model."

Lotus 01784 455445,

esuite.lotus.com;

Java Forum 01753 842824;

www.javavision.org



Sun has launched a Java development environment it claims allows for non-programmers to write applets with the aid of Java Beans: re-usable code components. Java Studio costs £62 and can be bought direct from www.sun.com/shop/sun



Labour rules out Y2K cash aid

■ No government cash will be available to help companies solve the millennium bug problem, says Industry Minister Barbara Roche.

"The problem came from industry and industry must solve it," she said at the launch of a Y2K survey, sponsored by the DTI and

Sage. This found that fewer than 50 percent of firms have allocated money from their current budget to tackle the problem.

Sage has set up a Y2K knowledge base at www.sage.com.

● Y2K "fix" in trouble: page 30

Sage 0800 336633

Visio shows off AutoCAD clone

Visio, developer of the bestselling diagramming and drawing package, is gunning for the daddy of CAD packages: Autodesk's AutoCAD.

It has launched its long-awaited clone called IntelliCAD, which it claims offers unparalleled compatibility with AutoCAD drawings, commands and applications.

A preview version will be available from mid-November, but you can sign up for one now at www.viso.com. Visio says this will enable potential buyers to evaluate how well the new product integrates with existing AutoCAD sites.

IntelliCAD will also offer features not



available in AutoCAD. These will include:

- A full implementation of Microsoft's Visual Basic for Applications.
- A visual menu editor and drag-and-drop button bar editor to facilitate customisation.
- A multiple document interface to enable work on more than one document at once.

IntelliCAD will sell for about £400, compared with more than £3,000 for a full version of AutoCAD. It will ship before next April.

Visio 0800 834859

Short stories

New hope for piggies in the middle...

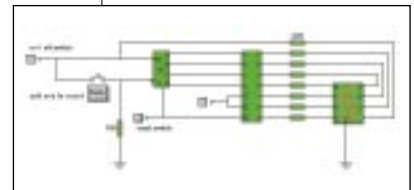
■ The word "disintermediation" is one of the ugliest to be coined in the web age: and it is worse for those whose livelihood it threatens. It means of course the exclusion by electronic commerce of middle-men from the process of trade.

But companies can survive by web-enabling their business in such a way as to offer the logistics and support purely net-based enterprise cannot offer.

This at least is the pitch of Masterpack International, which has signed a co-development deal with Microsoft to develop systems. It already offers a series of e-commerce modules for medium-sized businesses.

● *Ovum's view*, page 36

Masterpack 01865 784343



■ A home version of Crocodile Clips 3.0, which allows you to play with and test electronic circuits in simulation, is now available for £49.95 (inc VAT).

Crocodile Clips 0131 226 1511

Out Front

■ A beta version of FrontPage 98, the latest upgrade to Microsoft's web-site publishing suite targeted at home and small office users, can be downloaded at

www.microsoft.com/frontpage/. It wins

a Highly Commended award in our web editor group test this month. To find the winner, turn to page 188.

Visual Café

■ Symantec is shipping its rapid development kit, Visual Café for Java 2.0, for £429 (ex VAT).

Symantec 01628 592222;

www.symantec.com

Naturally Speaking

■ The price of Dragon Naturally Speaking was said to cost £279 ex VAT in our November issue. It is actually £279 inc VA.

p29 >

Syquest launches Jaz killer

Syquest has launched an impressive challenge to omega's Jaz drive with a fast 1Gb removable drive, offering the lowest cost per megabyte of its kind.

The suggested US price of the SparQ is \$199 (about £125) including a cartridge, for the internal IDE or external parallel-port version.

Extra cartridges cost just \$39 (£24) each, or \$99 for three. That works out at less than 2p per megabyte.

Even allowing for UK loading and VAT on these prices, this is cheap by Jaz standards. Internal and

external Jaz versions are selling for around £180 and £259 ex VAT respectively. A 1Gb Jaz cartridge costs £54 ex VAT.

The claimed performance of the SparQ looks good: an average sustained read/write data rate of 5.63Mb/sec; an average seek time of 12 milliseconds.

All this should be taken with a pinch of salt until the drives arrive in UK shops — probably early next year. Syquest's 1.5Gb SyJet did not appear for two years after the company announced it.

But there has been a big

shakeup at Syquest, which was toppled unceremoniously from its market-leading position for removables by the success of omega's P.

The market is now more cluttered, with hard-drive costs falling, a 2Gb Jaz from omega, and recordable DVD on the horizon.

Clive Akass

Syquest 0131 339 2022 www.syquest.com; omega 0800 973194 www.iomega.com



Short stories

Xerox offers home multi-function box

Xerox, which normally specialises in high-end PCs, has launched a multi-function machine targeted at small offices and homes. The Document Workcentre 450c offers colour printing, fax, scanning and copying for £499 ex VAT. It comes with Xerox's Pagis Pro imaging and document management software.

Xerox 0800 454197; www.xerox.com

Fast CD-R drives

Teac is offering a four-speed write, 12-speed read CD-R drive, the CD-R55S, for £370 ex VAT. Sony's new CDU928E-RP, capable of two-speed writes and eight-speed reads, costs a recommended £215 ex VAT.

Sony 01932 816000;

Teac 01923 225235



Hitachi's new 9.1Gb and 18.2Gb 3.5in SCSI hard drives offer a claimed 7.7ms average seek to read time and sustained data rates of up to 15.4Mb/sec.

Hitachi 01628 585000;

www.hitachi.eu.com/hel/ied/

Small printer sees red

Citizen's tiny PN60i portable printer has an infra-red interface to allow wireless printing from IR-enabled devices such as the Psion Series 5 (pictured below) and Windows CE machines. The thermal-transfer device weighs just 700 grams with its NiCAD battery and can use an optional colour cartridge. It costs £329 ex VAT.

Citizen 01753 584111

HP gets support for JetSend remote printing technology

Hewlett-Packard has licensed its JetSend technology, launched in July, to Xerox, Canon and Ricoh, taking us a step further on the road towards globally compatible data communications.

Operating-system and platform independent, JetSend lets you send documents direct from a scanner, digital camera or PC to any PC or printer worldwide. This ensures that documents are received accurately, clearer than a fax, and avoids problems in launching email attachments due to software incompatibility.

Hewlett-Packard, which has an annual turnover of \$40 billion, is currently developing JetRamp, a peripheral allowing ScanJet scanners to send data direct to the IP address of any similarly enabled product, and is working in partnership



with Microsoft in developing the next release of Windows to make the PC a JetSend-enabled transceiving device.

November sees the launch of the LaserJet 4000 (pictured above), HP's first JetSend-ready product.

HP 01344 360000;

www.jet.send.hp.com

Nik Rawlinson





Warehouse first to sell downloads

Software Warehouse claims to be the first UK company to sell downloaded software. Selected titles, initially mostly utilities, will be at www.downloadshop.co.uk. Sizes will be at most 7Mb to cut download times. Prices will be some 40 percent less than packaged versions. Chairman Steve Bennet admitted: "We have no idea how it will go." www.software-warehouse.co.uk

Correx makes a DOS of Y2K fix

Correx 2000, sold as a fix for PC clocks that don't roll over into the next century, was sent out with an unlicensed version of MSDOS 6.20.

It comes on a bootable floppy which, when its tests are over, leaves you at a functioning DOS prompt. A spokesman for its distributor, Secure PC, said when we pointed this out: "That's totally new to us."

The program's author also claimed ignorance of the copyright infringement but said steps

would be taken to remedy it.

Only the next day, Secure PC (best known for its anti-theft hardware) was delivering review copies to another magazine.

Later, the author admitted using unauthorised DOS files and said he was "looking at licensing arrangements."

Newsprint last month pointed out that the claim on the Correx 2000 box that it "fixes the time bug" is misleading: a rollover fix is crucial, but is only part of the Y2K problem and

the simplest to solve. Secure PC says it is amending the text after consulting its lawyers. The box says the product can fix a



PC BIOS "for the next 999 years", although neither DOS nor Windows takes dates after 2099.

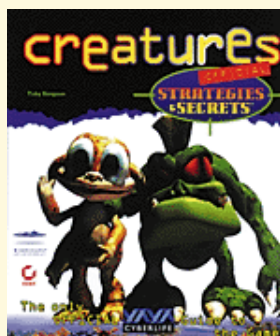
Correx 2000 works through DOS and does not interact at BIOS level. There are better fixes, which we will review next month.

Paul Wardley

It had to happen: a Cambridge company has set 2020AD as the year when it will offer the world a complete virtual human.

"So far we have managed to demonstrate that in order to create the artificial interface a human being would have to exhibit, we have to go for a holistic approach," said Anil Malhotra, business development director at Cyberlife, which developed the cult game, *Creatures*.

"Once we have got the working software, we will take it out of the virtual world and



Cyber spin-off: *Creatures* book from Sybex in the US

put it into the real world by creating robots." Phew. And it's not all talk: Cyberlife is doing concept development already. It wants to produce believable, lifelike robots initially for the entertainment market.

2020AD ... birth of the Cyberlife robot Adam

Caroline Swift continues her reports from Silicon Fen



The company, with input from a consultant at MIT, is developing the technology for software robots, or "softbots".

Within 12 to 18 months Malhotra anticipates having a prototype ready to deal with the real world. The work is being done in co-operation with a nearby consultancy called Scientific Generics.

Cyberlife is not short of backers. A funding round this year raised £2 million; investors include Acorn founder Hermann Hauser and net pioneer Peter Dawe.

It's a case of thinking about technobiology rather than biotechnology, says Cyberlife's chief scientist, Steve Grand. It is exciting enough to attract Alan Boyd, one of Microsoft's original employees, who has become development director.

"We are really creating artificially alive complex adaptive systems in which a key

characteristic is that they display lifelike behaviour. They are not just genetic algorithms, nor just neural networks. We combine all of the technology to produce very intelligent autonomous organisms," said Malhotra.

CyberLife metamorphosed in the mid-eighties from Logotron, whose software for schools was bought out by Longman. Left with a games business and staff including a couple of biologists, it wasn't long before the idea of building rich genetic structures came up.

The company fused computer science and biology to create what it calls "technology that is alive": reasoning lifeforms which last year were launched as state-of-the-art *Creatures*. In just a year 350,000 CD-ROMs have been sold. Now Cyberlife is looking at applications in retail, banking, air travel and

communications.

It is working with NCR on the relationship between retail space and consumer behaviour, and on the banking environment of the future.

CyberLife is also working with the Defence Evaluation Research Agency on pilotless aircraft and with BT on adaptive technology for telecoms.

Meanwhile, *Creatures* has sprouted 156 unofficial web sites worldwide. The web site www.cyberlife.co.uk is getting an impressive 620,000 hits a week.

Hermann Hauser was due to speak last month at a new networking group that has spun out of Cambridge. Digital People provides a meeting point in London for "a volatile mix of convergence people".

Visitors at its inaugural October meeting included Jerry Yang, founder of Yahoo, Michele Appendino, partner in Net Partners, Erik Hagen, head of Scandinavia On-Line, and Eva Pascoe, of Cafe Cyberia. www.digitalpeople.co.uk

Short stories

Utility bundles for Christmas

■ A Christmas offering from Quarterdeck bundles three PC utilities — FixIt, Clean Sweep and Magna-ram — for £49.99.

The tools help you clear up your hard disk, make best use of RAM and diagnose problems.

Astrasoft is offering a two-CD bundle of titles including First Aid 97, Norton Anti-Virus, Windex, Quick Views Plus, PC Handyman, and Powerdesk. It will be available in leading PC supplies stores.

Quarterdeck 0645 123521;
www.quarterdeck.co.uk;
Astrasoft 01494 464 765

**Alien aid in the classroom**

■ Adi, an extra-terrestrial tutor with a virtual classroom, is crossing the channel from France where it is said to have been a big success. He stars in a CD range for seven- to 15-year-olds, to be released in January, covering each school year in English and Maths for the National and Scottish Curricula.

Adi, an "intelligent" alien, lets children learn at their own pace and becomes a companion as well as personal tutor.

Dealer CUC Software has also just launched new Fisher Price multimedia programs for toddlers from 18 months up.

CUC 0118 920 9100

Adams CD delayed

■ Fans of Hitchhiker's Guide author Douglas Adams will have to wait until Spring for the release of his Starship Titanic adventure CD-ROM game.

It boasts photo-realistic graphics from award-winners Oscar Chichoni and Isabel Molina, and a natural-language engine which enables conversations with characters.

Zablac 01626 332233

Firm fined

■ Glasgow-based Stewart-Buchanan Gauges has been fined £3,000 after being named in a call to the Business Software Alliance's "shop your boss" hotline. An audit found four unlicensed copies of AutoCAD LT, one of Microsoft Office and seven of Win95.

BSA hotline 0800 510510

The Agenda conference is attended by the likes of Bill Gates and Andy Grove, and they are very accessible.

News of the Department of Justice's \$1million-a-day claim against Microsoft (see page 24) caused a buzz this year. It wants the fine to be imposed until Microsoft



Bill for Bill: \$1million a day

stops forcing PC vendors to install IE 4.0 with its OS.

I watched Gates as he heard the news break. He sat quietly through the sessions before going to check with his office. Then he became vocal. He claimed the dispute centres on whether Microsoft or the DoJ determines what is in an operating system.

He said the browser was becoming part of the operating system (Explorer

Witness to the Gates of wrath

Tim Bajarin, at the Agenda conference, watches as the Microsoft chief hears he may be fined \$1 million a day

4.0 will be merged into Windows 98) and that this was allowed by the terms of a 1995 DoJ agreement which made allowances for new features.

A poll of Agenda attendees found 65 percent in favour of the DoJ action. But most I spoke to doubted that the DoJ would win.

Even Sun chief Scott McNealy, himself embroiled in a lawsuit with Microsoft over Java (see below), said: "You can't defeat Microsoft

by gumming them to death."

Gates said IE 4.0 made Microsoft the biggest distributor of a Java client. McNealy complained that it was non-standard; but clearly his lawsuit has given him more publicity than he could buy.

● Agenda attendees, who have been very accurate with forecasts in the past, predicted 1998 PC industry growth will be 11.8 percent in North America, 12 percent in Europe, and 17.2 percent in Asia.

Grove defends chip prices

■ Intel chief Andy Grove showed the conference a graphics workstation-class PC built around experimental Pentium II chips clocking what he hinted was well over 600MHz. He also showed an NCI Pentium-based version of Interactive TV: Microsoft's Web TV (see page 40) uses a rival's RISC chip.

I asked him about Intel's consumer-chip prices, which have stayed high. Grove believes pricing is not an issue and that value is the real driving factor. Of course, low-cost RISC chips are meanwhile getting design wins in everything from smart phones to PDAs. It seems that Intel is willing to preserve its high margins by ceding the low-end market to competitors.

He's scared of Java, says McNealy

Microsoft is scared by the threat Java's cross-compatibility poses to Windows, claims Sun chief executive Scott McNealy (pictured, right).

Microsoft laid the path to its lawsuit with Sun over its Java licence by deliberately adding Windows-only APIs to the Java software included with its recent release of IE 4.0, he told the Gartner Group's annual symposium



in Cannes. "Java was wildly successful and then they signed up to it: in fact, it was so successful they had to sign up to it," said McNealy.

To loud applause, he slammed Microsoft's claim that users are not interested in Java's portability. "I have not met anyone who has said they do not want 100 percent cross-platform compatibility," he said.

He blamed the votes of Microsoft and Intel for Sun's setback in its bid to make Java an ISO standard.

Jonathan Lambert
VNU Newswire

p35 >

IT skills shortage opens up jobs market

Britain faces a chronic IT skills shortage, a major recruitment group has warned. The CRT Group has put £70 million into a plan to train 2,000 IT workers. They will be selected from people who tend to be excluded from jobs, like the over-40s, the homeless and single parents, especially women.

Mark Edwards, group business development director, said fewer than ten percent of the staff are in place to meet the estimated needs of the new millennium. There is a shortfall of skills in NT, networks, Oracle, Year 2000, COBOL and DB2.

"Corporates reduced their intake of new IT graduates in recession but we are paying for it now. Companies have underinvested in

IT training and now there is an unprecedented growth in demand by business to use it to remain competitive."

As a result, salaries have rocketed, with an Oracle programmer in the City earning up to £80,000. Rob Wirszyez, chairman of the government's IT skills project office, reckons that between 30,000 and 50,000 new IT staff will be needed by the year 2000.

Consultancy Logica, which employs 5,500 people worldwide, is so concerned that it has introduced a walk-in careers desk at its West End headquarters.

Operations director Ian Hardacre says it has increased its annual intake of graduates from 150 to 350, of which about 80 percent

have a computer science or science degree.

The new careers desk enables people off the street to have a pre-screening interview, not a job offer. It is attracting about 20 people a day. "We can determine whether a person is suitable for Logica and whether we are a good fit for them. They have to be prepared to be self-starting."

He said: "The demand for skills in the IT industry is not going to diminish. This is not a blip. We are going through a revolution in the way IT is getting into our lives, and from a careers point of view this is the right industry to be in."

Caroline Swift

CRT 0800 7314932; www.crtgroup.com

PCI modem points to death of ISA

Brain Boxes is offering what it claims to be the only internal fax modem to fit a PCI slot. The PCI V34+ card includes an emulation of the 16550 UART chip which normally mediates the link between serial data stream and the PC's parallel bus. PCs conforming to the Win98 spec will have no other buses but PCI, marking the end of the venerable ISA bus. The company offers a PCI-based quad fast serial port.

www.brainboxes.com; 0151 220 2500



Short stories

BT offers 25p-a-go document summaries

■ An answer to information overload is available on trial at BT Labs' Internet Online Shop. It's text summarisation software called ProSum, which is available as an online service or as a £49 Microsoft Word add-in.

Chris Dix, manager of BT Shop, says the system can summarise text as much or as little as needed, and users can choose keywords to pinpoint items of particular interest.

The online service costs 25p per summary using micro-payment tokens. BT plans to combine it with a search engine to let you to scan summaries of all documents on a topic.

transend.labs.bt.com

Microwaves offer fast alternative to lines

■ Web service providers are looking at microwave links as a cheap way of providing web connection to line-of-sight customers, says wireless specialist Groupe Pathfinder.

However, other companies are ignoring the technology as it is considered a black art, says MD Richard Porter. Microwave links can be used either internally or externally where they have an all-weather range of up to 100km.

Prices for an installed system range upwards from £3,500.

Groupe Pathfinder 0151 520 0855

Ex private eye fined for data sales

A former private investigator has been fined for offences involving the disclosure and sale of personal information to clients including major newspapers.

The case against Rachel Barry, who was said to have used deception to get information, like ex-directory numbers and itemised bills, has raised new concerns about defending privacy in an age of electronic data.

Her clients included *The People*, *The News of the*

World, *The Sunday Express* and *The Mail on Sunday*.

Harrow magistrates fined her £600 for procuring the information and £600 for selling it. She was also ordered to pay costs of £800. The offences were a breach of the 1995 Data Protection Act.

Data Protection Registrar, Elizabeth France, said after the case that problems can occur when data is readily accessible on local networks by junior staff.

"We are encouraging data users to make it less easy for staff not directly involved to have access to this kind of information, so that they cannot be harassed into giving it out to the wrong person."

The DPR's office has had few complaints over information accessed via the web. "The greatest concern involves spamming and receipts of large amounts of junk mail," a spokesperson said.

You can't beat your friendly corner shop with e-trading

The rise of global commerce will not lead to the death of your friendly local dealer, according to the authors of a new Ovum report.

Many companies see themselves opening up a world market by putting themselves on the web. But just because their "virtual shop windows" can be seen globally, it does not mean they are equipped to sell abroad: goods still have to be delivered and serviced, and then there are the legal complications.

"Companies underestimate the problems of international trade," said Mark Stevenson, one of three writers of *Ovum Evaluates: Online Commerce*. He said that there will always be a need for traders who are able to deliver and provide a local service.

The report evaluates nine commerce servers —

Broadvision, Connect, IBM, Intershop, Mercantec, Microsoft, Netscape, Open Market and Oracle. Stevenson said the best choice depended on what you wanted to do, but all those on offer had their problems.

Lead author Heather Stark said: "No company would think of getting a telephone as their only step towards success, although few would be able to do business without one. Organisations must think of their online business in the same way. What distinguishes one company from another are the systems and business models that support the connection."

She warned: "For every rising star of online commerce, there are massive dark spaces in between with no signs of life."

Ovum 0171 312 7318; www.ovum.com



Scoot is a hoot

Freepages web site has relaunched as Scoot. Billed as a Yellow Pages for the web, it has details of over two million UK businesses and a cinema guide. Users can access Scoot via the web or over the phone. Vodafone users can also receive text information via SMS on their mobile phones by dialling 333.

0800 192192;
www.scoot.co.uk

Windows 98 to offer TV internet access



Microsoft is planning to enable computers equipped with television tuners to receive free internet content using free space in television broadcast signalling. WaveTop software from WavePhore will be included in Windows 98, allowing users to receive information without paying for telephone calls or subscribing to the internet via an ISP.

WavePhore will be launching a data broadcast network in the United States before the end of 1997, which they claim will reach 99 percent of all households. The network will deliver news, information and entertainment, and be wholly supported by advertising. A number of big-name content providers have already been signed up.

This method of broadcasting internet content could prove extremely attractive to advertisers because the experience will not be interactive. Users will have to take whatever they are given: this may be too high a price for those who are used to the freedom of net surfing, but may prove a winner with people who are starting out on the web.

www.microsoft.com
www.wavetop.net

Play chess with your mate

■ BT's Wireplay has added chess to its list of multi-player games. Users throughout the UK can go head-to-head in either friendly or timed games.

Wireplay also supports two variants of speed chess: Blitz, where players have two, three or five minutes in which to make all their moves; and Fischer Clock, in which players start with just two minutes but gain an extra 20 seconds after each move. Players can "chat" to each other during games, and spectators can tune in to any game in progress. All the software

necessary to take part is freely available from the Wireplay web site or by calling 0800 800918.

Usage is charged per minute on a special telephone rate of 6p during the day and 2.5p in the evening.

www.wireplay.com



E-pub games are a virtual hit

■ Tired of that long walk over the road to your local? Help is at hand in the form of E-Pub from Uproar. The "electronic pub" site features a variety of pub machine games including Trivia Blitz and Cosmo's Conundrum, all of which have cash prizes. E-Pub has 40,000 registered users and is

proving so popular that Microsoft has booked all the advertisement space on the site until Christmas.

www.uproar.co.uk



Digital paper goes global with new free Java viewer

Hummingbird has released an internet publishing package which enables you to screen identical pages on virtually any platform.

Standard web HTML cannot guarantee WYSIWOG — What You See on Your machine is What Others Get on theirs — because the display depends on how the target machine interprets the language.

Adobe's Acrobat and Hummingbird's Common Ground both offer WYSIWOG by providing free viewers of their document files for major platforms such as Windows, Mac OS and the various flavours of Unix. But Hummingbird's new Common Ground Internet Edition is the first to offer a Java viewer to enable publishing for any platform supporting a Java Virtual Machine.

Hummingbird claims that its Digital Paper format, unlike Adobe's Portable Document Format, can cope with exotic

characters because it describes types mathematically rather than relying on font substitution.

The Common Ground Internet Edition is freely available to anyone posting Digital Paper documents on a public site. It includes a viewer and a driver that converts any Windows 95 or NT document into Digital Paper.

It is intended to promote Common Ground Web Publisher 4.0, which is targeted mainly at publishing on intranets. Features include automatic document conversion and hot-link updates.

An Adobe spokesman stated that a Java viewer for Acrobat is being developed but no launch date has been announced.

Common Ground's internet edition can be downloaded from www.hummingbird.com/cg/cgie.

Hummingbird 01628 777784

Internet shorts

Dynamic HTML approved

The World Wide Web Consortium (W3C) has approved Microsoft's proposals for the next version of HTML, the language at the core of web site development. The acceptance of "dynamic" HTML is a blow for rival Netscape which was hoping that its competing technology would be given the nod.

www.microsoft.com

www.netscape.com

www.w3c.org

L-plates galore

Kosmos Software has launched a web site for learner drivers. The site features a comprehensive set of resources, including a national directory of driving schools.

In addition to contact details, the directory lists the various services available like advanced tuition, female instructors and motorway training. The rest of the site has lots of information on different aspects of learning to drive, including licences, instructors, driving tests and buying a car.

You can also take an online theory test, but beware — your score may prove embarrassing, particularly if you have previously passed your driving test.

www.learners.co.uk



Legal pitfalls await unwary companies

A survey of companies with web sites shows that only 17 percent took any legal advice before setting up their internet presence. The survey was commissioned by national law firm, Eversheds, which states: "The net is becoming an excellent tool for business, but it is a legal minefield."

Almost three quarters of those questioned admitted that they had not taken legal advice on whether they could use their organisation's domain name on the internet. Eversheds claims there is little awareness of the problems which can arise in countries other than the UK through the use of a domain name.

Another increasingly awkward area is the question of trademarks: 20 percent of companies are using trademarks belonging to other organisations without having checked the legality of their use on the web.

Isabel Davies, Evershed's head of intellectual property, said: "Companies which don't check out their legal situation are storing up trouble."

www.eversheds.co.uk

Broadsheet web sites aim at student loyalty

Both *The Times* and *The Daily Telegraph* have launched web sites aimed at students.

The *Times* site, 4-D, has been developed in conjunction with Line One and aims to "provide a range of cutting-edge material, specifically created for, and by, students". Books and CDs can be purchased on-line and there will be competitions and chat rooms in which net-hungry students can "chew over the zeitgeist".

The *Telegraph* site, known as Juiced, is backed by Midland Bank, which is offering a prize of £200 for the best "electronic journalist" each month. The site covers similar topics to 4-D including news, sport,



travel and music, and provides personal financial information.

The sites invite comparison to the high street banks' practice of offering giveaways to new students when they open an account.

The *Times* and the *Telegraph* are hoping that the web sites will engender loyalty to their papers in post-university years.

www.juiced.co.uk; www.4-d.co.uk

www.lineone.net; www.midlandbank.co.uk



Internet shorts



Choosing the healthier option

The Health Education Authority (HEA) has launched a web site packed with information about fast food.

Aimed at "young people", the site forms part of the HEA's campaign to encourage people to make healthier choices when eating out in fast food outlets.

There is information about the campaign and a host of fast-food facts, together with some interesting scenarios where "a group of friends experience a number of fast food situations like Saturday Afternoon Burgers and Pre-film Pizza".

Mmmm... Sounds good enough to eat.
www.thinkfast.co.uk

At your
 convenience:
**Fast food facts on
 HEA's web site**

Modem makers see double in bid to maintain market

Audio modem makers are resorting to the strategy of doubling-up their products in a bid to breathe more life into a technology that should have died ten years ago.

Diamond Multimedia has announced what it describes as a 112Kbits modem: in reality two 56K modems using two lines in parallel, a process which is known as aggregation.

ISDN users routinely aggregate between two and six lines to achieve speeds of up to 384Kbps.

The Diamond modems will be introduced under the Supra brand name, which is currently number five in the US market. They will be on sale early next year. US Robotics is expected to announce a similar twin-modem

product at Comdex this month.

The 56K standard is not now expected to be ratified by the International Telecommunications Union (ITU) until early next year and additional technology could muddy the waters.

Modems can already be aggregated using some communications software. Audio modems, designed for voice lines, survived beyond their natural span because of the cost of ISDN installation and the failure of the communications industry to foresee the demand for high bandwidth.

Several technologies, such as ADSL and cable modems, are competing to replace them for mainstream data traffic.

Additional reporting:
Mike Magee

Multi-currency net payments become a reality via NatWest

NatWest bank has developed a multi-currency payment engine for the internet in conjunction with Jersey-based ISP, Supernet. The Worldpay system enables on-line retailers to sell their goods in 16 countries, with customers paying in their local currency.

The payment page of a registered retailer is located on the Worldpay server which transmits the transaction to NatWest and deals with the credit card clearance over ISDN. British ISP, PSInet, plans to offer the service to any of its customers setting up electronic commerce sites.

The payment engine began development in conjunction with online shopping site Barclay Square, and more recently was used to accept multi-currency donations on the official Princess Diana



memorial web site at up to £7,000 an hour.

"Worldpay increases sales potential by enabling customers to pay for products securely, in their own currency," said a spokesperson for Supernet.

Using the same foreign exchange computer as is used for the 24-hour

global credit card currency exchange rates, Worldpay sets prices on all its hosted sites once a day. This means web customers can be clear about what they will pay, rather than using a credit card where the rate of exchange is set some time after the payment has been made.

Worldpay makes a quarterly charge and a percentage on each transaction.

www.natwest.co.uk; www.worldpay.com

Dixons on web



Christmas is just around the corner and the thought of crowded high streets and stifling shops is enough to ruin anyone's seasonal goodwill. Dixons claims to have the answer to all this with the launch of its new web site. Over 2,000 electrical products, from PCs to hi-fis, can be bought via the web page at high street prices with next working day delivery.

"We have watched the internet closely as a channel for selling and now feel the time is right to enter the market," commented Mike Nevin, visual merchandising director.

www.dixons.co.uk

New search for knowledge

■ Encyclopaedia Britannica has launched a net search engine with a difference. Currently limited to 65,000 sites, the guide gives information only on those web pages which have been highly rated by a team of subject editors and copy editors.

There is a comprehensive description of each site, written by Encyclopaedia Britannica, with details of informational accuracy, quality and authority, together with ratings for ease of navigation and quality of design. Eighty-five percent of the

sites are described as "noteworthy" and fifteen percent have a "recommended" classification. Only one percent of the 65,000 sites has been judged "exceptional" and a mere thirty have merited a "best of the web" designation.

Although 65,000 sites represents a small fraction of what the net has to offer, Encyclopaedia Britannica is hoping that the guaranteed quality of the sites listed by their search engine will prove to be a winner. Any searches which come up blank are

automatically re-routed to the Alta Vista search engine for a web-wide search.

The internet's astonishing growth rate means that Encyclopaedia Britannica's team of web editors will be hard pressed to keep up with the number of new sites coming on-line every day. Another potential stumbling block for the new search engine is the lack of a localised UK version at a time when big players, like Yahoo and Lycos, are moving strongly in this direction.

www.ebig.com

Internet access via the national grid

A deal to beam the internet into the home via electricity lines could make a reality of the dream of fast, low cost web-access-for-all. That was the reaction of one analyst to an agreement between telecomms equipment maker Northern Telecom and UK electricity supplier Norweb to provide internet access to the mass residential market over Norweb's infrastructure.

This method will be ten times faster than ISDN, currently the quickest (but most expensive) mainstream method of accessing the net. Data can be transmitted at over 1Mbps, said Nortel, and as the network is already in place, the costs for the user should be lower than with other high-speed options like cable modems or wireless links. It will also be faster, though more expensive, than digital subscriber line (DSL) technology, which uses standard telephone wires to transmit multimedia content.

But some players in the expanding telecomms market claim that the technology under trial is still inadequate for business needs. Energis is working to develop similar "power line" telecomms with bandwidth sufficient to deliver sophisticated business data services.

Initially, the Nortel-Norweb services will be tested only in the UK but are unlikely to be extended in the near future to other European countries, or the US, because of the different layout of their electricity

networks. However, Nortel did not rule out similar partnerships with other European utilities, with analysts pointing particularly to Germany where the electricity giants are pushing heavily into the telecomms and internet services markets.

But schemes are starting up in other countries. In the US, electricity suppliers Peco Energy and Utilicorp formed a joint venture called Energy One to provide bundled telephone, net and energy services, and AT&T is likely to join the partnership.

The deal is the latest twist in a headlong scramble by infrastructure suppliers to cash in on the residential demand for internet and other multimedia services. Telco Energis said it is seeking to develop similar technology for its business customer base.

"We have been fully aware of the trials but have not been directly involved because their application is to the residential market," said chief executive, Mike Grabiner. "We believe that 'power-line' telecomms technology...has a potential application in business telecomms markets. Energis is seeking to develop this technology to allow higher bandwidth connection than that being trialled, to carry advanced business data services, conventional voice telecomms and internet access."

• See "Futures" in PCW next month for a full analysis of this new technology.

www.norweb.co.uk; www.nortel.com

Yell Top Ten New Sites



For your surfing pleasure we present a Yuletide log of the best new sites around, courtesy of Yell <www.yell.co.uk>.

The Christmas goose may be getting fat, but you can avoid going the same way with the aid of HealthNet, perched athletically at the number two spot.

1. Electrolux www.electrolux.co.uk
2. HealthNet www.healthnet.org.uk
3. Conde Nast Traveller www.cntraveller.com
4. Brainstormers Web Design Factory www.brainstormers.com
5. Poppets www.poppets.com
6. Apple-Expo www.apple-expo.com
7. Barclay Square www.barclaysquare.co.uk
8. Allied Dunbar Rugby Club www.rugbyclub.co.uk
9. The Internet Music Shop www.musicsales.co.uk
10. Fresh Records www.freshrecords.demon.co.uk

A tangled **web** we weave

Bill Gates' Web TV Plus paves the way for a revolution: enhanced TV, or an integrated web. Tim Bajarin looks at what will doubtless become one platform.

When the Web TV was introduced last year, I was among its critics. I could not see how adding the web, in its current form, to an analogue TV would attract consumers.

I was in a focus group when one member, after two minutes of viewing web information on a TV, asked when the movie was going to start. This incident highlighted the fact that static information will not be enough to attract a broad audience accustomed to motion video and talking heads. Yet the idea of a web-enabled TV is fascinating the PC, consumer electronics, cable, entertainment and broadcasting industries.

People in all these industries have begun to try and make the Web TV idea more appealing to a market driven by entertainment rather than information. Bill Gates has had a PC/TV project inside Microsoft's labs for some time and he decided, early in 1997, to buy the Web TV company for \$450m and to adopt its strategy.

At the time, most of us had seen only the original Web TV concept, and could not understand what made Gates pay so much for a company that had not made a dime in profits and was perhaps years away from making any impact. Now he has launched Web TV Plus, embodying what is being called "enhanced TV", which gives us a better understanding of what was behind the purchase.

Web TV was originally just a digital overlay on an analogue video signal so that the web and video contents were completely disconnected. The new Microsoft Web TV system lays the groundwork for a communications revolution, by marrying traditional video content with live and connected web data. Users can

toggle between a TV program and any related web content. You could be watching a football game on two thirds of the screen, for instance, and at the same time be tuned to ESPN's Sportzone web site checking out game statistics.

The next stage would be to develop content that is directly tied to the program you are watching. An example of this might be the new Dreamworks-produced show, Spin City, starring Michael J Fox. You could have a live web site with information about the actors and the story, even the actual script, readily available during the show. Afterwards, viewers could participate in a live chat session with Fox and his co-stars, and producers might garner new story ideas from the feedback. There could also be a commerce link. An MTV viewer could call a site to order a video or a CD and related T-shirts or hats, from a band that is performing.

As digital technology advances, vendors will add optical read-write storage devices to a Web TV-like platform. Then you will be able to actually purchase the album cut to which you are listening, via compressed streaming audio over the web, in which case you could have your own custom CD, on the spot. As the bandwidth opens up and full-motion video can be compressed and sent down various conduits, you could even download that MTV music video or movie.

Eventually, this Web TV-like platform will also deliver the videophone, as well as digital content that uses 3D and virtual reality technology, to change completely the way in which we work, play and learn.

No wonder Bill Gates bought Web TV. He has the chance to drive the digital standards needed to make all of this happen. The ramifications could be staggering. Up until now, we have populated only the business and upscale home markets with digital technology. The computer industry by itself accounts for close to \$600bn in annual revenue, but that is peanuts when you look at the digitisation of the masses. You can easily imagine the combined revenues of the industries involved reaching \$2 trillion to \$3 trillion over the next 25 years.

We are moving rapidly towards a digital economy that will have an even more dramatic impact on our lives than the telephone or television. The groundwork now being laid, by all of the people working on a digital model that marries web content with today's TV programming, will eventually cause the two to converge into a single, digital platform. That platform integrates the web, the television, the phone and many other digital media into an interconnected environment that is on track to make a real impact on the traditional consumer. ■

Net profit: MTV's web site could act as a music shop for viewers



DVD'ed they stand...

...DVD'ed they fall. Either way, the PC-RW vs DVD-RAM format debate must resolve itself and opposing factions must call a truce. Tim Frost comments.

The rift between the DVD Forum and the forces of Sony, Philips, Ricoh and Hewlett-Packard (HP) on the rewriteable DVD format has moved to the stage where, by the end of 1998, there will be two rewriteable DVD formats available to the PC market. The DVD Forum has always been split, with Sony/Philips and Toshiba/Hitachi/Matsushita taking different views on how DVD should develop. With DVD-Video and DVD-ROM, the groups have managed to come to an agreement to launch the read-only and DVD-R discs with the rewriteable format, but the two factions can't compromise.

In the summer, DVD-RAM (a caddy-based disc with roots in the PD optical disc) was ratified as the formal DVD rewriteable format. DVD-RAM offers 2.6Gb per side, and

both single and double-sided discs are becoming available from Maxell. Philips/Sony made it known that they were unhappy with the decision and last month, in a joint agreement with Ricoh and HP, announced their own competing rewriteable "DVD" format. Dubbed DVD+RW, the name for this Forum-unapproved version is likely to be changed to PC-RW, with PC standing for "phase-change".

PC-RW offers a higher storage capacity of 3Gb per side and the discs are caddy-free, like CD-R and DVD-R. It is DVD-RAM's reliance on a caddy, making it look like a large floppy disk, that has generated key criticisms from PC-RW's supporters; they say that future DVD-ROM drives have to be modified to take caddies and discs. A single-sided DVD-RAM can be removed from its caddy to play in any DVD-ROM drive, but disc manufacturers say that the DVD-RAM disc cannot be reliably replaced for further recording. DVD-RAM's supporters point to the added protection that the caddy provides, and believe that the costs and difficulties of making drives physically compatible with DVD-RAM are overstated.

The first samples of DVD-RAM compatible ROM drives indeed show that they can accommodate the caddies by using a simple square indent in a sprung CD tray, which adds little cost to manufacturing the drive. While a grab for technology licence fees always makes its

mark on these format disputes, the two groups appear to have genuine differences of opinion over the usefulness of their particular development.

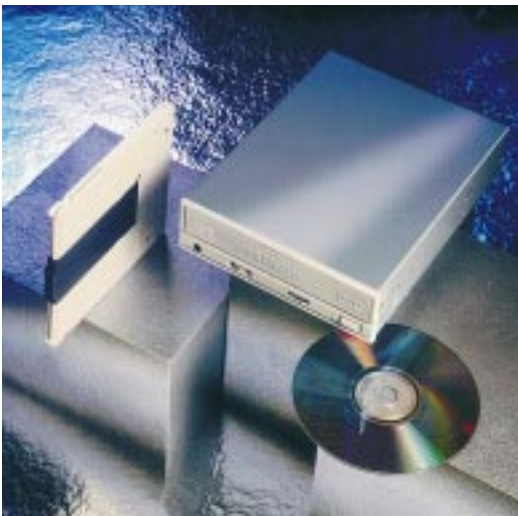
Toshiba is hoping to include DVD-RAM compatible DVD-ROM drives in its corporate notebooks, with DVD-RAM writers in desktops. A spokesman said that DVD-RAM, in its protected case and with slightly better performance on streamed files such as video, is "the perfect solution for on-the-road presentations, and the disc can be chucked in a briefcase and still survive".

The opposite argument is offered by the PC-RW group. The market expects DVD to be a bare disc and anything that veers away from that is bad news, says HP's DVD marketing manager, Dave Dean. "We think the vote is in and counted and it is clear that people like the tray-loading solutions — we have gotten away from cartridges and caddies in the CD world."

There are data structure differences between the two formats. PC-RW is like CD-RW with the data written into pre-cut grooves in the blank disc, and the file system is split into data blocks with the addition of further PC-RW headers. DVD-RAM uses both the grooves and the "land" either side of the grooves to hold data, and has a PD-type data structure relying on embossed markers. At the data level, the formats are incompatible and the discs from one format cannot be used with the writers of other.

This incompatibility goes beyond the writers and into the DVD-ROM drives. None of the current generation of DVD-ROM drives can read rewriteable discs, but future releases will have LSI modifications to allow them to read the different physical data layout of DVD-RAM or to respond to the additional headers in the PC-RW data stream.

Both groups insist they will not support the opposition's rewriteable format in their DVD-ROM drives. This affects every buyer of DVD-ROM, with, for example, a Sony drive able to read PC-RW discs but rejecting DVD-RAMs, and Pioneer drives doing exactly the opposite. Despite the posturings on both sides, it would seem that the PC industry may put commercial pressure on manufacturers on all sides to support both formats, at least in their DVD-ROM drives. Although a strong selling point for upmarket PCs, the DVD-ROM drive remains one small part of the complete PC system. PC manufacturers want to avoid a situation where one OEM'ed part of their PC is responsible for a rush of service support calls from puzzled and annoyed customers who find that their branded PC will read some "DVD" rewritables and not others. There is pressure for drives that will handle both formats, no matter how unpalatable that is to the manufacturer concerned. ■



Ratified: a DVD-RAM drive from Hitachi

Short stories

Works well on paper...

Opinion at PCW Towers is divided over this latest wheeze (pictured, below) to get your pennies. For £4.99 you can buy these special notepads, designed to replace your mouse mat. They come with non-slip pads on the bottom. Most people in the office would not try one, for fear that ink might clog up their mouseballs. But your intrepid Newsprint reporter dared to be different, and thought them a good idea. So did his mouse, which liked having a fresh surface to run about on every other day. It saves desk space and gives you a fair chance, if not a certainty, of finding that vital phone number you scribbled down three days ago.

You can buy the pads in three designs from major sellers of computer stationery, or expect to see them as promotional freebies.

Details on 01494 815049 or email mousenote@aol.com



FileMaker Pro databases get netted with version 4

Claris has launched version 4.0 of FileMaker Pro, which it claims is the world's bestselling PC database system after Microsoft Access.

New features of FP 4.0 include the ability to access and enter data using simple HTML templates. Claris claims this means you can publish and collect information over the web without any extra software. Other new features include automatic conversion of Excel spreadsheets, and custom forms.

Claris is the software arm of Apple, but publishes FP 4.0 for both the Mac and



The new version of the database system makes more of the web

Windows (NT, 95 and 3.1) platforms at the same recommended price of £199 (ex VAT).

Also launched last month was the new version 5.0 of its integrated office package ClarisWorks, again on all platforms. New features include web page design facilities and compatibility with MS Office, Corel and Lotus suites.

Claris has announced a best-ever \$91.1 million revenue for the quarter up to 26th September, which it credits largely to sales of Mac OS 8.0.

ClarisWorks 5.0 costs £99 (ex VAT) or £49 for upgrades.

Claris 0181 756 0101
www.claris.co.uk

● See *First Impressions*, page 96

Top 10 Windows software

			Last month
1	MS Encarta Deluxe 98 CD	Microsoft	-
2	MS Flight Simulator 98	Microsoft	-
3	MS Bookshelf 96(Win 95)	Microsoft	-
4	Nuts & Bolts (3.1+95)	Xatlantic	1
5	Smart Draw	Kiss	-
6	MS World Atlas 98 v3	Microsoft	-
7	MS Home Essentials 97 C/V	Microsoft	-
8	Partition Magic v3	POW	5
9	MS Office Pro 97/ book/upgrade	Microsoft	4
10	MS Office 97 Stand V/Comp	Microsoft	6

DOS

			Last month
1	DOS 2 Win95 upgrade/net	Microsoft	1
2	MSDOS v6.22 upgrade	Microsoft	2
3	MS WI 95 OEM 5 Pack CD	Microsoft	9
4	MS WFWG 3.11 base	Microsoft	6
5	System Commander v3.0	POW	4
6	Turbo Pascal v7.0	Borland	-
7	PC Anywhere v5 Host	Symantec	7
8	Corel WP 6.2 U/G	Corel	3
9	Novell Personal NetWare	Novell	10
10	FSFX Upgrade for MS Flight	Microsoft	5

Top 10 CD-ROMs

			Last month
1	GCSE Maths	Europress	1
2	GCSE English	Europress	5
3	3D Interior Design	Europress	6
4	GCSE Physics	Europress	-
5	Driving Instructor	Europress	10
6	Encarta 98 Deluxe	Microsoft	-
7	Speak Fluent French	GSP	2
8	Bodyworks 6	Learning Co	8
9	Family Tree	Leister Productions	-
10	Speak fluent German	GSP	4

Peripherals

			Last month
1	Joystick promotional	Zye	-
2	Umax Astra 600 PP	Umax	1
3	Umax Astra 610P	Umax	-
4	USR Sportster Flash Ex	USR	3
5	Evergreen 486/586 proc upgrade	MID	5
6	HP ScanJet 5P	Hewlett-Packard	4
7	USR Sportster WinModem In	USR	4
8	MS Sidewinder Precision pro	Microsoft	-
9	Awe64 Gold	Creative	-
10	Awe64 Value ISA	Creative	10

The other week, my 1993 vintage Psion Series 3a joined the Choir Invisible. The first sign that anything was amiss was the alarm. Instead of its usual church bell every morning at 6.15am, it started to squawk at me at various ungodly hours of the night. Then it began to complain that its batteries were permanently low. And then, one morning, it just refused to come on at all.

I'm not one of those whose life is regulated by his organiser — I tend to remember things like tax demands, dentist appointments and copy deadlines anyway — so I didn't get emotional, nor did I have to avail myself of counselling, as the Americans and Japanese apparently do. I was just miffed at the tragic, senseless waste.

Anyhow, I rang Psion, and they told me there's a place in South London that can do a Lazarus on these things. You check it in with them, go for a coffee or a beer, and then, on your return, behold, it is risen. Well, I wasn't particularly busy that week, and friends informed me that Streatham can be fairly pleasant at this time of year, so I decided to make the trip to said service shop.

"Fifty quid!" I protested. "For replacing one worn-out cable?" (The most common cause of death, and probably the one in this case, is the cable linking the keyboard to the screen: constant opening and closing of the clamshell case eventually wears it through.) "It might be more," said the girl at reception. "It *is* quite an old model, you know, so you never can tell what else might be wrong with it." First, it would be necessary to take it to the operating theatre, open it up, and look inside. Having peeked, they'd be able to give me an estimate. I told her that I might be prepared to pay £50, but if it came to any more it could stay dead. So while the technicians scrubbed up, off I went up Streatham High Street.

She did have a point, of course. It was a rather old model and there was therefore no telling what else might go wrong with it, even if they did fix it this time around. Then again, they were saying much the same thing about my great aunt 20 years ago when debating whether or not to give her an artificial hip. Today, I understand, albeit with the aid of a stick, she can still hold her own in an egg and spoon race. A conundrum, therefore: pay £50 and risk oblivion in the near future, or forget it and buy a new one. But *which* new one?

I took a look in Dixons for inspiration. They were advertising the Psion Series 5 in the window, but they only had a picture of a Series 5 and a box — not the machine itself. On a scale of let-downs, this is somewhat akin to going to Wembley to see Bob Dylan only to find when you get there that he's sent his socks instead. Come to think of it, I've never actually seen a Psion Series 5 anywhere and neither has anyone else to whom I've spoken. It's probable, then, that like the Yeti, the Loch Ness Monster and a stable version of Internet Explorer, it remains a thing of legend rather than reality.

But Dixons did have some real Windows CE units on display so I used the time to poke away at them and make snide remarks. What is the point of having a full-function computer and equipping it with a screen and a keyboard that are more suited to a Fisher-Price Spellmaster? It's like playing a £1,000 Aiwa CD through an acoustic horn speaker.

No joy there, then. I was about to give up and say "Sod it, I'll pay the £50" when I happened across an oasis in the high street. The Organiser Shop, it was called (or something similar). I peered in through the window and there they all stood, winking at me like a row of Amsterdam tarts. Such style. Such class. My dilemma was sorted. I returned to the service shop, said thanks but no thanks, collected the dead body and went back to Organisers R Us for a *tête-à-tête* with a salesman.

A mere credit-card swipe later and it was mine. A remarkable thing it is, too: stylish, like the Limited Edition Psion Series 3a of a couple of years back and just as portable. Length and breadth, it's about the same size as a cheque book but opens up to A5. Like the new Windows CE handhelds, it utilises pen technology. To enter an address, you access an alphabetically-sorted section headed Addresses and input the information manually using a pen. Entering appointments and anniversaries is easy: months are indicated by recesses



Michael Hewitt

Sounding Off

Michael Hewitt to suffer that most painful of personal losses, the death of a Psion. There's no time to grieve, though, as he rushes off to buy a new one.

in the body of the unit, next to which the days of the year are listed sequentially to allow rapid input and retrieval of data. And once it's entered, there it stays, impervious to battery failure, airport X-ray machines, or sunspot activity.

Of course, there are a few downsides. Unless it spontaneously combusts, it won't wake me up in the morning. And connecting it to my PC's serial port isn't a particularly effective way of exchanging data, either. But for £12.50, pen included, how can I complain?

● See also: *interview with Psion designer, Martin Riddiford, p178; and Newsprint, p25.*

■ mike.hewitt@mjh1.demon.co.uk

For years, I had a rigid “no beta” rule, and flatly refused to try any software that wasn’t shrink-wrapped. I took the pledge after Symantec gave out pre-release copies of Norton Utilities Version 8, codenamed Jason, with the promise that the software was in final version except for the packaging. Jason could not cope with the latest version of the Stacker compression system and trashed my hard disk. Norton and Symantec shrugged off my predicament with the excuse: “It’s not the final version”.

Microsoft has turned beta testing into a fine art, having given thousands of guinea pigs the chance to find out whether pre-release Windows 95 would crash their systems. When Microsoft gave a briefing on Win98, they handed out Win98 CD-ROMs like sweeties. I was wary, but was reassured that the Win98 installation process offered the safe option of easy reversion to Win95. Colleagues told me they had installed successfully.

The first surprise was finding that safe loading needed over 160Mb of free disk space — at the briefing we had been told 120Mb. But the installation process was warm and welcoming. I chose the option to keep all original Win95 files safe in case I wanted to go back to them.

Halfway through installation, the setup program could not find some driver files which it needed. They were nowhere on the Memphis ROM. When I tried to cancel, up came the warning that cancelling before finishing would leave Win95 unusable. This stuck my PC between a rock and hard place.

I called the Microsoft UK beta helpline. The technician was helpful but shocked that anyone should be trying to load Win98 onto a working machine. “This is only an early version,” he told me. “You should have been warned only to try it on a spare machine”.

We certainly hadn’t been warned, and I later learned that the colleague who had found Windows 98 installation so smooth had been using virgin machines, with clean hard disks.

On Microsoft’s tech advice, I escaped from the half-finished Win98 install process by powering down the PC and re-starting, ignoring the “safe recovery” option and a forest of error messages. Through past mistakes I knew that I must not let my anti-virus software try to repair, and thus trash, the boot files it now detected as changed. Inoculate is the safe option.

Because the startup files had been scrambled, the PC no longer recognised the CD-ROM drive. Because my machine had come with all system software pre-loaded on the hard disk, I had no way to re-install the ROM drivers. My most recent backup tape had been made under Win95. Although the Colorado tape drive works under DOS, the Colorado DOS software refuses to read a backup made under Windows. Luckily, I had an old DOS tape which got the ROM drive working, which let me re-install Win95 from the DOS prompt, which let me

restore data from the Windows backup tape: a solid 24 hours of non-stop, nail-biting work.

But the fuller horror story started to unfold. Win98 installs around 1,200 files on the hard disk. Many have the same name as Win95 files but a later date, so any Win95 re-install operation must be set to override the normal default and overwrite newer files. This gets rid of same-name Win98 files but it still leaves the hard disk knee-deep in Win98 files with different names. Overwriting loses setup options, by replacing them with defaults.

Win98 had partly installed a new version of Drivespace compression and this refused to run. The Win95 Plus! CD refused to re-install the original Drivespace because it found a later version. Over several more days, Microsoft Support helped me to edit the scrambled Registry and rename and move files to fool the Plus! disc into thinking there was nothing newer in its way.

My poor PC now works almost as well as it did before I tried to install Win98, albeit with directories renamed “\$!\$!\$!” and error messages popping up each time Win95 falls over a stray file or fails to find a shortcut.

The key point, Microsoft’s Beta Support Line explained, is that early betas lack Uninstall. Without this, the only way to remove the Win98 detritus is to reformat the hard disk. Microsoft’s press briefers had neglected to tell us that. They have shown no sign of concern so you



Barry Fox

Straight Talking

Beware of the beta: for years, Barry Fox has pledged never to install one on his machine, but the wiles of a Win98 beta got the better of both he and his hard disk.

can be sure it will happen again. I’m now saying “NO” to all betas — forever. Well, would you road test a car with prototype brakes on the M1? If you must road test a beta, first take the time to check your boot, system and rescue discs and backup tapes. You may be surprised how useless they really are. If you are buying a new PC with pre-loaded software, ask about system driver discs.

I have just noticed something in the small print on the Win98 ROM label: “Software expires Jan 31 1998”. So even beta testers who enjoyed a smooth ride may find themselves stranded on 1st February with no working PC.

■ 100131.201@compuserve.com

It is that time of year again when DP managers like to throw another programmer on the fire and sit back to wish for a few practical things in their stocking. With my business hat on (the red one with the fur trim) it's easy to think of a few things most business IT users would like. So here, in no particular order, is my list to be sent up the data centre chimney:

- I'd like some stability in web browsers. Yes, versions 3 of Netscape and Internet Explorer added lots of functionality I couldn't live without, but now the versions 4 have added stuff which it's going to take a couple of years to catch up with. Let's have a period of settling in before we're bombarded with previews of version 5. Give the poor site designers a chance.

- Then I'd like a PC that genuinely is upgradeable. For years it has been the case, allegedly, but I'd like one where any part, from processor to memory, can be snapped in and out to taste. When I write "snapped", by the way, I don't want to have to put so much pressure on a board to get it in place that I end up with a half-inch groove in my fingers. Nor do I want to pull out tiny plugs by microfine wires because there's nothing to get hold of. And while I'm on the subject of upgrading, I'd like drives that fix into drive bays without worrying about rails. And cables that are long enough so I don't have to practice macramé to add a tape streamer to an existing controller.

- Once I've got my upgradeable PC I'll need an operating system. I'd like the friendly features of Windows but none of the drawbacks. For instance, I want it to start immediately. No more will I have that stomach-turning moment when I have just switched off the PC and realise that there was one more file to copy off it.

I know it's a tough one, but I'd also like an operating system that doesn't crash. And, I'd like to see the end of the double click — entirely and completely. I've been helping users with Windows since version 1 and the thing that has caused most confusion is double clicking. I've watched experienced users double click a button and wonder why two actions occur. I've watched newcomers click an icon and wait. And wait. And wait...

- Back on the hardware for a moment, let's have decent screens. The first request is really another Windows plea. Yes, I like clever screens that switch off after a few minutes of not being used, but please make sure they come back. There's nothing more frustrating than a monitor that stubbornly refuses to come out of standby.

My favourite present on the screen front, though, would be the demise of the ever-large cathode ray tube (CRT). No more monstrosities that take up half the desk, cripple you if you try to lift them, and probably pour out

yobba rays (anyone remember Space Patrol? OK, so you're not that old). Let's have affordable, high-resolution plasma screens. I'd opt for something around the 50in mark but I don't want to pay more than £500.

- So to applications. For a start, I'd like Microsoft to get its act together over email clients and address books. Outlook and Outlook Express have nothing in common.

Then there's the personal address book, and the address books of each of these. Sorry, I want a single address book and a single client to handle everything. When I want to insert an address in Word, it shouldn't have to ask me where to look every time (and it shouldn't default to the personal address book — the one I'm *least* likely to use). When I do get an address, it should have the company name in it. What's the point of a business address without it?

I could go on and on about applications, but let's keep it simple. I'm not someone

who moans about too much functionality. I love AutoComplete and spell-checking on the fly, but please make sure everything works together. Isn't that the point of having Windows applications? Who is to do that? Microsoft. No more cop-outs on the lines of "it's not our

“I'd like an operating system that doesn't crash, and I'd like to see the end of the double click — entirely and completely”

Business Matters

Brian Clegg has an IT user's Christmas wish list — may your browsers remain stable, your PC become genuinely upgradeable and the CRT wither away.

application". Instead of fining them, the US authorities should make Microsoft check that everyone's software works together under Windows, and make sure it's fixed if it doesn't.

- Oh, and finally, I would like a force feedback joystick. It isn't going to do a lot for the cash flow, but it will make Shadows of the Empire (the latest Star Wars game) even more enticing.

So, is my list a bit long? Could there be a touch of wishful thinking there? OK, maybe I will have to make do with just the joystick.

■ BrianClegg@msn.com



Brian Clegg

Does the name Roger Excoffon mean anything to you? He was French, a self-taught graphic designer who became artistic director of the Olive type foundry. His Mistral typeface was based on his own handwriting. It's the script font you see throughout France and it ships with products like MS Office and CorelDraw (sometimes a.k.a. Staccato 222). It's particularly brilliant as it looks like real handwriting and the letters join together with uncanny accuracy.

Excoffon's achievement is all the more admirable in that he did it all with pen and paper, yet now anyone with £140 to spare can have their own handwriting immortalised in TrueType. A UK company, Formula Solutions, offers this service, and they'll also incorporate signatures and company logos into a TrueType font. My handwriting is so illegible that I've had to use mechanical forms of writing for years. I can think of no reason to digitise my own script, except perhaps for use as some sort of encryption algorithm. But I fell upon the demo version eagerly. This included two sample handwritten fonts and a utility to use them in a word processor.

There seems to be some bizarre character mapping somewhere: I eventually managed to convert the handwritten text to an exotic mix of accented and other upper-ASCII characters in normal Arial. The samples certainly weren't in the Excoffon league and lacked £ signs, but it made a change not only to be typing the usual nonsense, but also near-illegible nonsense.

Flash, bang, wallop

The idea of simulating an activity concerned with creating simulation is intriguing. A product called Photographer aims to improve your 35mm photography techniques without you ever having to buy a film. It autoruns entirely from the CD-ROM, installing nothing on your hard disk, thereby gaining several points in reviewer-friendliness. But as the first thing I saw was an error message saying that it would only run in 256 paletized (*sic*) colour, it promptly lost them again.

Start up, and you have various windows on-screen. One shows the scene, with a choice of static and moving subjects (from F1 racing cars to birds at sunset) all with optional sound effects. At the bottom of the screen is the camera. You have the choice of a simple SLR with manual controls or an advanced camera full of bells, whistles and LCD panels. Various other windows show the choice of lens, a toolbar (lose more points for no tooltips) and overall scene brightness.

Finally, there's the viewfinder: what you see here is controlled by dragging a small rectangle around the scene window and zooming or changing lenses. Workshop text panels take you through the basics of operating the camera and the particulars of each scene. Click on the various camera controls, take some shots, and your pictures are instantly "developed", then criticised.

Coming to terms with the interface is the first hurdle. The documentation is definitely in the "could do better" class, and although aperture and speed is interactive, focusing only offers the choice between automatic and typing a number into a dialog box. It's all good fun, but the quality of the images in the viewfinder and developed picture frames don't do the program justice. A pity, as there's over 500Mb of the CD unused.

Unfortunately, much of the advice is utter gibberish. On a shot taken at 1/250th of a second at f1.4 on a standard 50mm lens, focused at 2m, I was informed that everything between 0.9m and 4.1m was in focus and warned about camera shake. Experienced photographers will no doubt already be guffawing, but for the rest of us it's just not possible for that combination to achieve that depth of focus, and only those in the terminal stages of *delirium tremens* would be likely to move the camera during exposure. Nice idea, sloppy analysis, awful interface.

Pretentious, moi?

It was with a feeling of *déjà-vu* that I removed the shrink-wrap from Oz Clarke's Wine Guide, as there on the box was "One of the best CD-ROMs you can buy" — *Personal Computer World*. Now, Paul Begg reviewed the Microsoft Wine guide, hosted by Oz Clarke, in our May



Tim Nott

From the desktop

Handwriting, photography and DIY greetings cards claim Tim Nott's critical eye, and it's enough to drive him to drink. But not without Oz Clarke's wine guide.

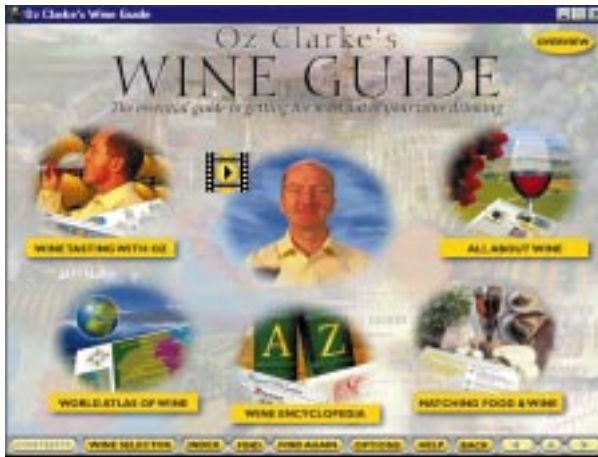
'97 issue — but he didn't write that. Turning over the box, it says "Oz Clarke... strips away the mystique and snobbery surrounding wine" — which he did write.

This CD-ROM comes not from Microsoft, but from Websters Multimedia. It is the "third completely revised and updated version of the program previously published as Microsoft Wine Guide". Confused? So was I.

For anyone interested in wine, this CD-ROM is wonderfully encyclopaedic, covering the world's vineyards, wine production, vintage charts, tasting notes and a glossary. There are also videos of Oz dispensing his affable wizardry.



Top Photographer: How to become a David Bailey (*who?*) without actually having to buy a film
Right A comprehensive guide to the world's wines, some interesting oddities and videos of Oz
Below Make your own cards and avoid the card-shop scrum



Criticisms? It rather labours the point on the fundamentals: I think most potential buyers will already have mastered the basics of getting the contents out of the bottle

and be approaching power-user status. And although the "What to drink with..." section is full-bodied and well-rounded, it did lean rather upmarket. A sweet Sauternes with, say, Roquefort cheese is surprisingly excellent, but I felt that blowing a bottle of Andrew Will Cuvée Lulu Chenin Blanc (bone dry, delicately floral, good fruit intensity and plenty of refreshing acidity — OC. ...And rather expensive — TM) with fish and chips was *de trop*.

Although depressingly few bottles in my cellar even make it onto Oz's C-list (perhaps because there are depressingly few there) this is a truly fine CD that left me with a thirst, and Microsoft is welcome to quote me on that one.

If you can't beat them...

One of the fun activities with graphics software and colour printers is creating your own personalised greeting cards. However, this desktop's traditional sledgehammer-and-nut approach of struggling with CorelDraw for an hour or so is hardly a money-saver.

Enter the purpose-made CreaCard Gold, where Carlton Cards, presumably scenting a shrinking market in ready-made cards, has teamed up with Micrografx.

Mrs Marie Holmes, a Satisfied Customer of W. Yorkshire has, according to the blurb on the box, tried "...all the others but they do not compare.

CONGRATULATIONS & THANK YOU!" Now there, apparently, speaks an expert (or perhaps obsessional) card-maker, so minutes later I was 43Mb of disk space the poorer, half of which, strangely, seemed to be a screensaver.

The first surprise is that although it's a Windows application, it takes over the entire screen, hiding that confusing taskbar thing and all the other "Stuff You Don't Need to Know About". Next surprise is the Kid Lock: "Portions of the content... and the add-on packs available... may be unsuitable for children." This brightened things up a little.

Getting into the program proper, the chunky cartoon interface persists, with screens of pre-designed cards for every occasion from Halloween to Hari Raya and, of course, birthdays. And there are the usual reassuringly awful jokes: "No trees were destroyed to make this birthday card..." (turn over) "it was made from finest recycled material at a sweatshop using child labor at eight cents an hour!"

There is something for everyone here, ranging from the cloyingly sentimental to the downright rude, and in this respect there's very little difference from browsing in a card shop, except you can edit the text. Should you want to go further, there's an option to add your own scanned or digital photos, and a drawing application with an interface that achieves the rare distinction of being simultaneously patronising and confusing. When you have created the card, you can print it or send it via email.

The other part of the package is Forget Me Not, a combined address book and calendar. When you've tired of the available

content, you can call a special number, deploy your credit card and receive a code for unlocking additional material from the CD, including Celebrations of Faith, Off the Wall and Adults Only. ■

PCW Contacts

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CreaCard Gold from Micrografx
01483 747526 www.creatacard.com

Formula solutions 0181 252 4444
www.formula.co.uk

Oz Clarke Wine Guide 0990 084201
www.ozclarke.com

Photographer D & F Equipment
01264 335334 www.brighterpaths.com



Letters

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Last month *PCW* ran the first undercover PC group test ever done in a computer magazine. The reader feedback has been very positive and for that we are grateful. We are also grateful to the participants who were the targets of our operation. As in any critical review, there are some winners and some losers, and we feel that it is only fair to let the companies involved comment on our approach. Here's what they have to say.

■ **From: Evesham Micros**

Thank you for giving Evesham Micros the opportunity to comment on the UK's first undercover PC group test.

Reading the review of your purchaser's experiences, as a reader I would be very surprised that my company is still in business after 14 years, let alone that it is still shipping out thousands of PCs a month to buyers old and new. But then, I would be equally surprised, as a Managing Director of such a large organisation, if we did not occasionally suffer from the odd glitch. The important thing is that we learn a lesson from our mistakes, and we have shown that we do learn and do get things right most of the time.

Your mystery purchaser had one unfortunate experience with Evesham Micros. But it was one machine out of the thousands that we ship out every month. In a recent survey of over 250 Vale owners (*PC Magazine*, August

97 edition), Evesham Micros came within the top five companies for reliability, likelihood of purchasing from the same vendor, and for service. I think you would agree that the finding of their survey is more representative of our operation than this particularly unfortunate but isolated incident.

Our business has developed by concentrating on quality and after-sales service. I would imagine from your description of the packaging you received that the machine had been damaged in transit, although you omitted to mention it. We have reviewed our courier situation in light of your findings.

Your readers may rest assured that we will continue to build Evesham Vale computers to the highest standards. And we will continue to provide a level of service that is, according to a survey of over 250 Vale owners, second only to one.

Richard Austin
Managing Director
Evesham Micros

■ **From: Golf Computers**

When first approached by *PCW*, we had no hesitation in agreeing to take part in an undercover test. After all, we believed in our claims to provide flexible systems, reliable delivery and superb customer support, so this seemed the only legitimate way to put it all to the test.

When the review was printed last month, we were both surprised and elated. Surprised at the wide array of quality

companies taking part in the survey, and elated to be awarded Editor's Choice.

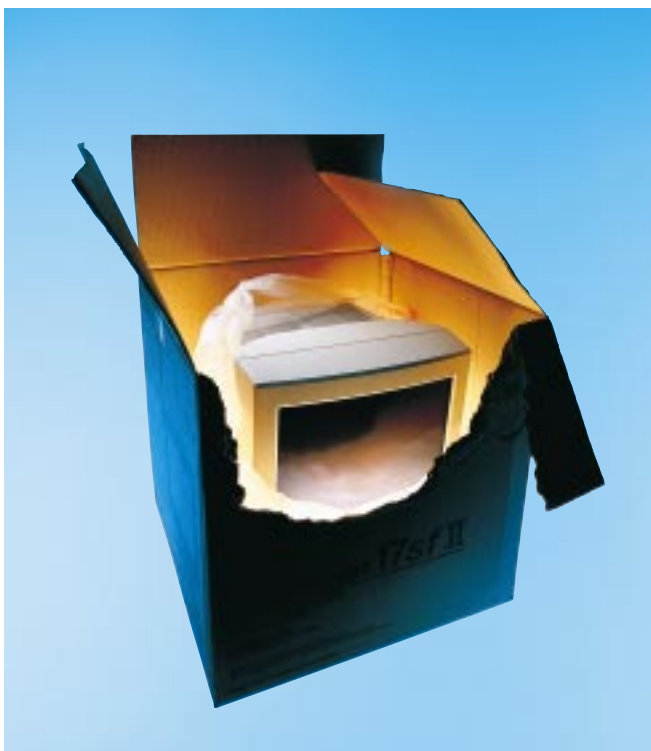
The detailed description of our Promax products and services confirmed several points we knew already — the excellence of many of our components, including the AWA speakers and Iiyama Vision Master screens, and the friendly and helpful service. It also helped to highlight a number of improvement areas of which we are aware and are working on at present. For example, we are looking at ways of upgrading the presentation of the machines, and we are mounting a recruitment programme to augment our sales team.

We fervently hope that more reviewers adopt this undercover approach of system testing, as it is clearly the only way to obtain the same service and product functionality information as a customer would — and it provides useful feedback for all involved.

Jonathan Senior
Operations Manager
Golf Computers plc

■ **From: Viglen**

We were very pleased to take part in the "undercover labs test" in the December issue of *PCW* and believe that this sort of review is very important. However, we do feel that there are a number of unfair comments in the review and are pleased that we have been given the chance to reply.



Firstly, in "The Buy" section, Viglen was criticised for refusing to deliver the PC to an address because the person who was at the address was not the person who ordered the PC, and he was not the holder of the credit card used for the purchase. Because of the risk of credit card fraud, we have procedures in place to protect our customers, ensuring that people do not purchase PCs using other people's cards and that people do not falsely accept deliveries.

Secondly, we were pleased that our technical support was praised in solving the technical problems, and very surprised and disappointed that the caller seemed to have had to wait a long time to speak to one of our technical support analysts. We keep a very tight call logging system and have looked into the two waiting times mentioned. Our records show that the average call waiting time for the period shown was seven minutes but, as with any support system, we are prone to peaks and troughs for busy periods

and can only assume that this was one of those times.

We have taken all of your comments on board, and would like to assure your readers that we are always looking at ways to improve our support to ensure that our customers receive the best possible service available.

June Stokes
Head of PR
Viglen Ltd

■ **From: Stak Trading**

Thank you for awarding us the Highly Commended award in your undercover review last month. It was great to receive recognition for our efforts.

There were a few ADI monitors that slipped through with an American plug, but we have tightened up our incoming inspections and can assure any future customers that they would not suffer this irritation.

Although the review commented that our payment options are limited, I would like to point out that we do accept Visa, MasterCard, Switch and Delta as well as cash and cheques.

We believe at Stak Trading that to offer a complete service, we must give strong support in both pre- and post-sales. Therefore, we do not employ "order takers" on the Sales Team, but experienced enthusiasts who know what they are talking about, which is why you found us to be "one of the most knowledgeable companies we dealt with".

As you pointed out, we employ more people on Customer Services than sales and that's why you got through on the second ring. Again, these people have done their time in our assembly area and RMA (return material authorisation) departments before interacting with customers.

It was a fantastic idea by PCW to go undercover and discover the real levels of product and service that the customer will receive, and we hope you will do more in the future to keep the industry on its toes!

Graham Woodcock
Sales Manager
Stak Trading

■ **From: Armari**

With reference to the undercover test featured in the December 97 issue of PCW: In the "Did it turn up on time section" you state that the Armari system failed to arrive on time due to the fact it had not finished testing. The system was indeed delayed by a day due to our pre-shipment stability tests being unfinished.

The reason for the system being delayed further was that we became suspicious about the validity of the purchase, which was via credit card. The customer, Mr Evans, was never available on the given contact number; instead we always got an answerphone message giving two other contact names. When it actually came to

process the credit card, the first two cards we were given were declined. At this point, we decided not to ship the system until we could fully verify the card and delivery address through the issuing bank. The system was eventually shipped on the Friday for a Monday a.m. delivery.

In the "Failure Factor" section it was said that we failed to include a mouse. However, when the system was returned to us, a mouse was also returned with a serial number matching the mouse we sent out. As the mouse was returned to us mixed in with the polystyrene loose fill packaging, we can only assume it must have come out of the accessories box during rough transit to PCW, and the reviewer failed to search the packaging or contact us regarding its absence. We have since been cross-taping the accessories box to prevent it popping open in transit. As we supply build-to-order systems, great care is taken to prevent parts, documentation etc. being omitted. Parts lists are checked and signed off by two members of staff during the final pre-shipment stability testing phase, and again during final packaging.

In the "Customer Support" section it was said that there was some confusion over the monitor picture shimmering (the answer PCW was looking for was a low refresh rate setting). New Armari systems which have been pre-installed with an operating system have all the monitor modes and optimal refresh rates set prior to shipping. We also install a system configuration manager which takes a snapshot of our shipping configuration and can inform the user of configuration changes such as refresh rates. If PCW had re-installed the system or purchased the system without software, we

would have offered this as an explanation.

All in all, we feel that the undercover tests were a great way of showing where a company's strengths and weaknesses lie. We are in favour of these tests continuing, as we believe it will greatly aid the consumer in making the right decision when confronted with the endless array of manufacturers in the PC market. We believe that these tests will show consumers that when they buy a PC from Armari, they can expect the best and the most reliable the industry has to offer. This is our policy that has not, and will not, change.

Jon Fisher
Marketing Manager
Armari Ltd

■ **From: Carrera**

I am writing to congratulate your team on the excellent Undercover PC Group Test that appeared in the December 97 issue of *PCW*. It made a refreshing change to see a magazine take on the role of a buyer and thoroughly investigate every stage of the purchasing process.

Carrera was particularly delighted to have been selected to take part in this test. We had put ourselves forward, but had no idea that one of the Carrera machines was going to be reviewed. Carrera prides itself on excellent customer service and support as well as quality PCs. Our sales and support staff were really motivated by this feature — it was good to see them finally getting some recognition for their work.

PCW did its homework on this article. You even noted small but important details such as the fact that Carrera only levies a one percent credit card surcharge instead of the usual three percent, and the fact that the Carrera technical support team have a customer's full system details in front of them as they work.

There were a couple of points that we would like to be mentioned, however: Carrera's buy-back policy on all systems sold, and the fact that Carrera has a repair and upgrade centre in central London which offers same-day turnaround for most upgrades and repairs.

The *PCW* undercover test was the first feature that actually showed the whole picture instead of simply concentrating on the PCs themselves. This sort of feature exposes the pitfalls that so many purchasers need to know about. It was a brave piece. Well done.

Neil Simpkin
Marketing Manager
Carrera Technology

■ **From: Dell**

Thank you for including Dell in your recent Undercover Group Test. Customer satisfaction is our top priority so we were interested in your comments, and consider the test extremely valuable feedback.

There is one point I would like to clarify for the benefits of your readers and our customers. In the review, you state that "Dell was one of a few companies to charge our credit card before the machine had been despatched". I have investigated the background to the particular order and that comment is factually incorrect.

According to our records, the order was placed on the 17th September 1997. The order was then shipped on the 23rd September 1997 and invoiced on the 24th September 1997. The credit card was subsequently charged on the 24th of September.

However, as we have to get authorisation at the time of order, the funds would have been reserved but not charged from that time. While it is true that the customer's credit was affected, the customer was not actually charged until 24th September.

For the benefit of your readers, I would like to clarify Dell's corporate policy on credit card orders. Our normal practice is to charge our customer's credit card ONLY when the order ships.

I hope this clarifies matters.

Annette Condon
Public Relations Manager
UK and Ireland
Dell Computers

Matrox madness

I have been buying *PCW* for years now, and have nearly always agreed with your reviews and reports. But I was furious to read your report on the Matrox m3D in December's issue [*3D graphics cards group test*]. To me, it was totally wrong.

Firstly, you said that the Diamond Monster 3D using the Voodoo chipset was for people wanting to play games at maximum resolutions. But the 3Dfx add-on cards cannot go above an 800 x 600 resolution, compared to the m3D which goes to 1,024 x 768. On my Intel 233MHz (not Intel Pentium II) I can get 47 frames a

second in GL Quake at 1,024 x 768 using the m3D.

Also, you just tested it on a 166MHz machine; but since parts of the m3D run at the clock speed of the machine's CPU, it could mis-inform people who have machines running at 200MHz or above, as at these clock speeds the m3D easily outperforms the 3Dfx cards.

The 3Dfx cards may have more games supporting them, but you will find that patches will be quickly written by Matrox so that the m3D can be used on these games. So far, every other review of the powerVR(2) chip has said that it is technically superior to the 3Dfx chip. And as for the large polygons, I have seen none; however, I have heard numerous reports of the 3Dfx cards giving poor images due to the loop-through cable.

How your report can differ so dramatically from all the other reports. Do you all own 3Dfx cards? All in all, yours was a very anti-Matrox report which doesn't hold up with the rest of the industry.

Will Lean

WJLEAN@HOTMAIL.COM

Dylan Armbrust replies:

While Mr Lean is correct in his assertion that the Power VR PCX2 chipset used in the m3D does scale up in performance when running with a higher-clocked CPU, his 233MHz-based PC isn't reflective of what the majority of people own in their home. In fact, over 35 percent of PCW readers still have 486s on their desktops, while a larger number have Pentiums clocked below 166MHz. The minimum spec for the PCX2 chip is a 166MHz CPU: it's also the entry-level PC today, and that's why we selected it.

Again, Mr Lean is correct in his assertion that the m3D can handle a higher resolution. But again, you need the processor power to make the best use of it. For those who don't have, or can't afford, a powerhouse PC, the Orchid Righteous 3D is an economical alternative. We're also sure that most people in this situation would be content running their game at 800 x 600, especially if they have a 14in or 15in monitor.

As for Final Reality, it is a fully DirectX 5.0 compliant benchmark of which ALL graphics card drivers make use of. Many of the graphics cards handled the benchmark admirably, others didn't and so faired poorly. Regardless of "the industry's" view, we stand behind our results and our review.

CompuServe service suffers

I wonder if the much anticipated buyout of CompuServe by AOL is responsible for the new realism which has afflicted CompuServe. Frequent users of CompuServe will be aware of the lamentable response to the technical support number which generally rings engaged for hours at a time.

Complaints to technical support in the past have been answered with promises that everything is being done to improve the situation, offers of connect-time credit and profuse apologies. My most recent experience is to be told that the technical support is poor and that it will not improve in the foreseeable future. This would be a surprising attitude from any service provider, let alone a long established one like CompuServe.

My company has now cancelled all but one of our CompuServe memberships and uses cheap, off-the-peg ISPs. Their service is not great, but at least we're not paying for added value that we're not getting.

John Stolz

johnstolz@jsi.co.uk

Nick Solomon, Customer Service Manager of CompuServe, replies:

Our technical support is certainly not poor, as Mr Stolz suggests. In fact, I believe it is the best in the industry with expert assistance available online around the clock, and phone lines open 16 hours a day, seven days a week.

To the best of our knowledge, Mr Stolz himself has never been a CompuServe member, but rings our support line on behalf of a number of individual members. While he may have experienced some difficulty reaching us by phone from time to time, I can confirm he was successful on many occasions. We even advised Mr Stolz that it may be more cost effective for him in the long run to ring his local CompuServe support centre in France.

While it would be great to answer all calls 100 percent of the time and within one ring, this is not a realistic expectation of any support centre — today, or in the foreseeable future. What we do aim to achieve is a potent mix of expertise, efficiency and effectiveness that addresses the real needs of our members. We have also invested considerable effort in self-help tools, so our members can find the help they need at their fingertips, either

online though the excellent support areas of Communities or through the new help tools featured in our next CD, currently in production.

Customer consideration

I have recently abandoned my Acorn 5000 and started shopping for a Pentium II PC. I found plenty of suppliers, but what made the difference was the after-sales support. I regretfully turned down the otherwise excellent deal offered by Time Computers when I found that telephone queries for customer support for software queries would cost a hefty 50p a minute! Gateway, my eventual choice, has to score highly with Freefone customer support available for as long as you own the machine.

Customer support is a hidden extra not always considered by purchasers who are carried away by what they see demonstrated in-store. I feel it ought to be highlighted in advertisements as a matter of course so that it can be brought to the attention of people who might overlook it as an important consideration.

PMINOLI@aol.com

Customer support is a vital aspect of a PC purchase. It's no good going for the cheapest and best-specced system when no-one answers the phone and the PC turns up late and badly built. In last month's undercover PC group test we put 14 suppliers under the spotlight and found an enormous difference in terms of their customer service.

Gateway, incidentally, took 16 minutes before we spoke to an operator, and a further 30 minutes to solve our relatively simple technical questions. However, as pointed out above, the entire call was free of charge.

The trouble with 2000

Having recently taken out a three-year subscription to PCW, it has just occurred to me that this will expire in August 2000. I just hope your subscription software is Year 2000 compliant.

Martin Light

Martin.Light@btinternet.com

Our subscriptions department has taken measures to handle any Year 2000 problems. In next month's PCW we'll be taking an in-depth look at Year 2000 issues and what to do about them.

Specification: spot the difference

I purchased a PC from a local company, the specification of which included a 200MHz MMX processor. On delivery I found that the indicator on the front of the system unit showed 200; however, on boot-up, the processor was described on the screen as a 6x86 PR166 which, to me, indicated a 166 processor. On speaking to the company I was told that the chip was a Cyrix 166 which had the equivalent speed of an Intel 200. The invoice shows a 200MMX. I was ready to take this further when a colleague who is knowledgeable about computers commented that there may be some justification in the company's assertion. In all other respects the computer appears to meet the specification and work well.

Address withheld

Yes, the Cyrix 6x86MX PR166 is slightly faster than an Intel Pentium 200MMX in performance, according to a few benchmarks out there. However, if you're feeling principled and you did order an Intel Pentium 200MMX, you might want follow it up, especially with regards to price: the Cyrix 6x86 166 is substantially cheaper than the Intel Pentium 200MMX.

Internet Explorer loses its way

The day after IE4 was released, I downloaded it and rushed to install it in on my computer. After rebooting, up popped my groovy new desktop — but when I double-clicked on My Computer, it crashed, and continued to do so every five minutes. After a day of this, I thought I'd uninstall most of it, just leaving the basic browser. Did this help? No. It carried on crashing every five minutes. So I had to re-install Windows 95, again.

Downstairs, my Dad was also installing IE4 and got the same result. He too had to re-install everything. And guess what? We tried to install it on my sister's computer: the install crashed, and to this day we cannot get the Display Properties up. Is this some sort of weird thing restricted to our house, or is this a common story?

Ashley Penney

ashp@meganet.co.uk

Having experienced a variety of unsatisfactory occurrences with IE4 ourselves, PCW wishes Ashley and his well-equipped household the best of luck. ■

Gadgets

Compiled by Adam Evans. Photography by David Whyte.

ErgoMouse

Research shows that more than six hours of mouse use per week can cause physical harm, yet almost 15 percent of Europeans still exceed that limit by at least three hours. Similar levels of usage in the US have, to date, cost industry \$7bn. But all this could change with the introduction of the Anir ErgoMouse from Norway.

Resembling a joystick but sliding across the desk like a mouse, it promotes a more natural position, reducing stress on hand, arm and back muscles. Distributed throughout the UK by Esselte, the current right-handed version will be joined by a model for lefties in February 1998.

Price £75 (£63.83 ex VAT)

Contact Esselte 01233 624421 www.animax.no



Senso CIC

The world's smallest digital hearing aid has been launched by Widex. The Senso CIC actually fits inside the ear canal to provide almost invisible help for hearing loss. The advanced digital signal processing provides automatic volume correction 32,000 times per second and enhances the clarity of speech over any random background sounds. Senso CIC hearing aids are fitted in both ears, providing a natural sense of sound direction and allowing you to use telephones and headphones normally. Power is supplied by a tiny zinc air battery with an estimated 100 hours of use.

Price £1,895 (no VAT payable)

Contact PC Werth 0800 454338 www.widex.com

Evolution Music Creator Pro 61

Evolution Electronics' latest product is a full-size 61-key MIDI keyboard with a host of funky features. In addition to a full complement of white and black keys, it has pitch-bend and modulation wheels, octave shift, six program memories, sustain pedal socket, a standard MIDI socket and a keyboard-to-sound-card cable. If you want to try before you buy, Evolution says that the keyboard is currently being demonstrated at PC World stores throughout the country. Just follow the sounds of those tinkling ivories...

Price £174.99 (£148.93 ex VAT)

Contact Evolution Electronics 01525 372621
www.evolution.co.uk



CD HydroBath

Worried by dirty, seedy CDs? Losing sleep over fingerprints on your discs? Your problems could be at an end with the advent of the CD HydroBath from Discwasher. Apparently, it uses the scientific principles of hydrodynamic technology along with a specially developed high-speed rotation platform — or to put it another way, it spins the disc around and gives it a good-old wash. The supplied CD6+ cleaning fluid is enough for 100 CDs and the HydroBath can be run off any standard 6V DC power supply or four AA batteries if you're one of those dynamic types who needs to clean CDs on the move.

Price £23.42 (£19.93 ex VAT)

Contact Ross Consumer Products 01204 862026 www.recoton.com



Lap Top Locker

It's a real mixed bag on the Gadgets page this month. JanSport is pepping up those dreary laptop carrying cases with a new range of trendy backpacks specially designed to carry portable computers. The Lap Top Locker (*pictured here*) has a 21-litre capacity, a rubber base for protection and a CD organiser pocket. Its big brother, the Lap Top Transit, has a 37-litre capacity and extra padding throughout. Both packs are the same price and are made from 1,000-denier Cordura. At last, a bag for your laptop that you can carry without shame.

Price £60 (£51.06 ex VAT)

Contact Global Accessories 0181 877 9907 www.jansport.com

Logitech MouseMan+

Let's face it: mice are generally very dull items. But Logitech is one company that just keeps on surprising us with interesting new products. The MouseMan+ is a gloriously sculpted creation that fits the contours of your hand, perfectly. There are three buttons; two in the usual place and one under your thumb. It takes a bit of getting used to but can be less of a strain than using your index finger.

The wheel is a standard fitting on many mice these days and Logitech supplies its own MouseWare software to make the most of it.

Price £39.99 (£34.03 ex VAT)

Contact Logitech 01306 734300 www.logitech.com



First Impressions

A **Samsung** monitor shows off (p75) and Intel has the ultimate in video-conferencing, **Create and Share** (p83). **CorelDraw 8** (p88) stretches its legs and **MS Financial Suite 98** is where money talks (p91). **Norton Antivirus 4.0** (p92) cleans up your act.

■ Hardware

Gateway G5-166M

Christmas is coming and this PC is bundled with an Epson printer. Could make a nice present.

Hoping to capture the Christmas market, Gateway has come up with the bright idea of bundling a Pentium PC with an Epson Stylus Color 300 printer in what may be the ideal package for the first-time computer buyer.

You get a Pentium MMX 166 processor and 430TX chipset, 32Mb RAM (expandable to 256Mb), 512Kb pipeline burst cache and ATI 3D Rage II+ graphics with 2Mb of onboard RAM — everything you need to get straight on with business (or games, for that matter).

Setup was a breeze. All ports and plugs are colour-coded so it was merely a matter of matching like with like to ensure no immediate disasters. At 2Gb the hard drive may be adequate for most home users at the moment, but with the coming years destined to see the release of a host of increasingly resource-hungry applications, it was rather on the tight side. The internal US Robotics 33.6Kbps modem included a microphone and a copy of Phone Tools to offer data, fax and voicemail facilities. Using the pre-

loaded online trial software, we connected to AOL at full speed on the first attempt.

The monitor, a 15in Gateway Vivitron model with a viewable area of 13.9in and a host of easy-to-use controls, had a maximum resolution of 1,280 x 1,024 but shimmered when run at anything above 1,024 x 768. Its flat screen reflected the minimum of light and was comfortable to look at throughout the duration of our tests. The Windows 95 keyboard felt loose, comfortable and light to the touch but was nonetheless fairly unresponsive. The Microsoft Intellipoint mouse, as ever, lived up to its usual high standard.

Gateway should be commended for looking to the future with the inclusion of two USB ports, when many manufacturers are still producing machines without them. The Mitsumi IDE CD-ROM drive runs at 24-speed and the included Altec Lansing speakers are driven by an Ensoniq Wavetable PCI 32-bit sound chip to offer 16 MIDI channels and produce highly satisfactory output. Both the sound and graphics chips are built onto

the motherboard to save filling valuable expansion slots. The bundled software consisted of an impressive choice of packages, including Microsoft Office 97 Small Business Edition, Money 97 and Encarta 97.

Access to the interior of the machine was easy and required no tools. Inside we found a spacious and well-organised layout with three PCI (all free) and three ISA (two free, none shared) slots. But placement of the PCI slots meant two of them would not be capable of taking anything larger than half-sized cards.

The 32Mb memory is in the form of a single 168-pin SDRAM with access to the remaining slot being free and unobstructed. Two free bays (3.5in and 5.25in) offer opportunities for more storage capacity, although using the 3.5in bay would be a major operation requiring the removal of the existing hard drive and framework for the 5.25in bay. The unused serial and USB ports (two of each) should give plenty of scope for peripheral connection.

The bundled Epson Stylus Color 300 printer

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VNU European Labs

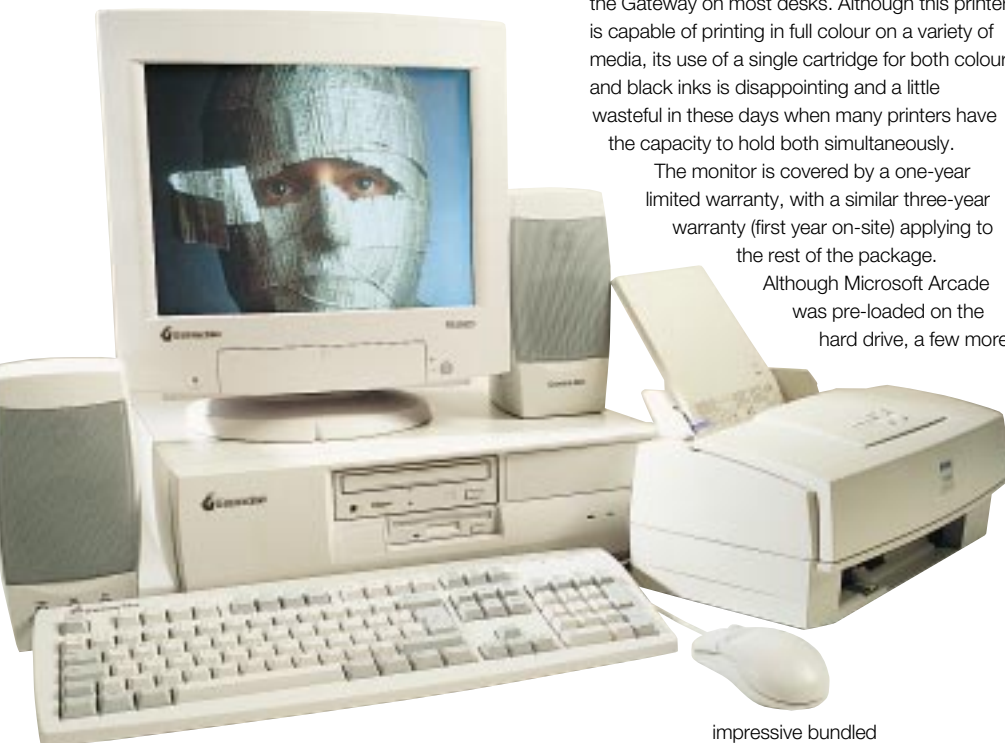


VNU Labs tests all kinds of hardware and software, from PCs to modems to databases. All our tests simulate real-world use and

for the most part are based around industry-standard applications such as Word, Excel, PageMaker and Paradox. Our current PC tests for both Windows 95 and NT are the Sysmark tests from BAPCo. In all our performance graphs, larger bars mean better scores.

Ratings

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



(see our colour inkjet roundup, p146) produced mediocre results at very slow speed and so was possibly not the best choice for bundling with what is a fairly fast PC. It is a small unit that should, with the minimum of fuss, easily fit beside

the Gateway on most desks. Although this printer is capable of printing in full colour on a variety of media, its use of a single cartridge for both colour and black inks is disappointing and a little wasteful in these days when many printers have the capacity to hold both simultaneously.

The monitor is covered by a one-year limited warranty, with a similar three-year warranty (first year on-site) applying to the rest of the package.

Although Microsoft Arcade was pre-loaded on the hard drive, a few more

impressive bundled

games and perhaps a joystick would have been welcome additions to this package for the Christmas season.

Although the system comes with a desktop case as standard, upgrade options for tower

and ATX full-size tower are available at £15 and £35 respectively. Other upgrade options could involve increasing the memory to 256Mb, the monitor to 21in, and a variety of multimedia and warranty packages.

Nik Rawlinson

PCW Details

Price £1,173.83 (£999 ex VAT)
Contact Gateway 2000 0800 172000
www.gw2k.co.uk

System Reviewed Pentium 166 MMX, 32Mb SDRAM, 2Gb HD, 24 speed CD ROM, 15in monitor.

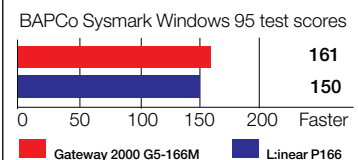
Good Points A practical bundle for first-timers.

Bad Points Could have bundled a better printer.

Conclusion It's nice to see an all-in-one package for the first-time user.

★★★★

Performance results



■ Hardware

Tiny Home Cinema System

PC, projector, TV, home cinema and games arcade. Home entertainment on a grand scale.



bays, one occupied by the floppy drive. The build quality is good, Tiny having taken a lot of care with the structure and the tying of cables inside the machine.

To merit its Home Cinema System badge Tiny has fitted a primetime Goldfinger MPEG II PCI card to decode the DVD movies, and has installed software from Zoran to play and skip through the tracks. Zoran is currently in the news for having produced an MPEG II decoder through software alone. It's a tough job though, which requires the processing muscle of a Pentium II to match the quality of a dedicated hardware card. Tiny's 233MHz PII is probably up to the job, but until software decoding is a proven solution, Tiny is sticking with a hardware card. The

Goldfinger has no external plugs, instead passing its information directly to the graphics card's internal feature connector.

Tiny has thrown in a copy of the recent Bond movie, Goldeneye, on a Region 1 coded DVD. Despite MPEG-II being a global digital video standard, there are people who would prefer you not to buy DVD movies in foreign lands for playing here at home. Consequently, most DVD movies carry a regional flag for identification: Region 1 is USA and Region 2 is Europe. Domestic DVD players will only play movies from their home region, effectively preventing Europeans from playing DVD films imported from the US.

Computer DVD-ROM drives, however, may have their regional coding specified through software drivers. Tiny has installed drivers for Region 1 since no Region 2 drivers, nor indeed any Region 2 movies, are yet available. This begs the question of future compatibility. As it stands, Tiny's PC will be unable to play Region 2 European movies when they come out. Tiny will supply Region 2 drivers when available, but then, you won't be able to play back any Region 1 titles (including the supplied Goldeneye movie) since you can only have one Region installed at a time.

One possible but untested solution is to set up two identical hardware profiles through

Windows 95. Install Region 1 drivers on one and Region 2 on the other, start up your machine on the desired profile and keep your fingers crossed!

Audio-wise, the Tiny features Dolby Pro Logic decoding although, despite having an output for a centre speaker, there wasn't one supplied. Consequently, the Tiny operates in Phantom mode, effectively driving its four speakers in plain Dolby Surround. Sadly, there was no output for the high-quality Dolby Digital AC-3 soundtracks, optionally available on most DVD movies.

Tiny supplied a remote-controlled VGA converter with composite and S-Video outputs to drive the projector. But, in order for the remote to switch outputs, the monitor signal is passed through the converter. In this process, the monitor's image quality is severely reduced, rendering it useless at anything above 640 x 480 pixels: we recommend you connect the monitor direct to the graphics card for normal use and manually switch cables for the projector.

This Tiny system is much like the £1,996 Tiny Sound and Vision system featured in our Home PCs group test this month (p128). For an extra £940 you get the Philips projector and screen, DVD drive, 32Mb RAM and software including Microsoft Football, Encarta 97 encyclopedia, Money 97, Works, a Formula 1 game and Goldeneye on DVD. It's an impressive overall bundle, but let down by the video switching and audio side of things. The PC configuration is good, but we would transform it into a home cinema using better components of our own choice.

Etelka Clark

The Tiny Movie Centre is an all-in-one entertainment system which can be used as a television, a movie player, a games arcade... oh, and a computer too. The 17in Samsung monitor is good enough for general use but if you're having friends around or doing a presentation, set up the 4ft square projection screen and flick on the Philips LCD projector (both supplied as part of the bundle).

The ATX-style motherboard is home to a 233MHz Intel Pentium II processor, LX chipset, and 64Mb of SDRAM which occupies two of the three DIMM slots. Fitted in a fast AGP slot is an excellent ATI Xpert@Work 3D graphics card (the almost identical Xpert@Play PCI card won our Editor's Choice in last month's group test). The motherboard features Yamaha General MIDI audio and a PCI TV tuner card had also been fitted.

Two of the four PCI slots were vacant, while both of the ISA slots were occupied by the 33.6Kbps modem and a card supplying the speaker outputs. There are three 5.25in bays with one taken up by a Toshiba DVD-ROM drive (sadly unable to play CD-R discs) and two 3.5in drive

PCW Details

Price £2,936.33 (£2,499 ex VAT)

Contact Tiny Computers 0800 821 333
www.tinycomp.co.uk

System Reviewed PII 266, 3.2Gb hard disk, 64Mb SDRAM, 17in monitor.

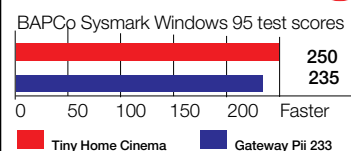
Good Points DVD drive. Fast chip. Good graphics.

Bad Points Terrible video switcher. Poorly thought-out audio.

Conclusion A good basic machine, but better to add home cinema options of your own choice.

★★★

Performance results



Hardware

Samsung SyncMaster 400TFT

Slim and gorgeous. Not how you would usually describe a monitor, but this Samsung's a cut above.

There is some computer equipment that always seems to attract a gaggle of admirers. While my 15in bog-standard monitor enjoys Ford Escort-like anonymity, this new flat-screen display from Samsung got attention befitting a turbo-charged Ferrari with every extra in the book. The basic reason for this is a good-looking profile: the SyncMaster is under five centimetres thick with a small but stable circular base (22cm diameter). The entire unit weighs 3.7kg.

The base holds some pleasant surprises, starting with a pair of integrated speakers and a built-in microphone. The speakers are rated to a maximum of 3W and produce only average sound. Sound quality has taken second place (perhaps rightly for this type of product) to the need to squeeze stereo speakers into the case.

The second surprise is the USB socket hidden at the back of the base. This makes it easier to connect and disconnect USB peripherals but I am a little disappointed that there is only one socket (so only one USB peripheral at a time). Conversely, the headphone and microphone sockets are thoughtfully situated



at the side for easier access.

The display is bright, sharp and vibrant. The maximum resolution is 1,024 x 768 at 60Hz (flicker-free on a TFT panel) and it can also display 640 x 480 and 800 x 600 (although not full-screen). The viewing angle is impressive, with an 80-degree vertical and a 120-degree horizontal range. On-screen controls are

comprehensive, covering colour temperature, picture geometry, brightness, contrast, microphone on/off and speaker volume.

The SyncMaster 400TFT comes with a separate AC/DC power adapter and a converter for use with Macs.

This 14in display is the first of a range of TFT panels which Samsung is developing. A 15in panel will be out before Christmas and we'll see 17in and 21.3in (...oooh, nice!) versions in the second half of 1998.

Adam Evans

PCW Details

Price £2,583.83 (£2,199 ex VAT)

Contact Samsung 0800 521652
www.samsung.com

Good Points Sharp, bright picture. USB.

Bad Points The usual TFT big price hit. Non-removable base.

Conclusion Highly desirable, but only for those with very deep pockets.

★★★★

ViewSonic Graphic Series G773

Not a looker from the outside, but inside it's vibrant, sharp and ideal for colour-intensive apps.

For some reason, perhaps known only to ViewSonic founder, James Chu, the company's logo is three Australian finches: maybe it was to add a little colour and style to the front of its monitors. The Graphics Series G773, the company's latest 17in, sorely needs something to dress up its bland exterior.

Designed for colour-intensive apps like small-business DTP work, presentation design and web development, the G773 promises sharp images and vivid colours comparable to aperture-grille CRT monitors. These are bold claims indeed, that no monitor manufacturer should make lightly.

So, should the makers of aperture-grille tubes such as Sony and Mitsubishi be quaking in their boots? Not quite, as we'd still recommend those types of monitor for professional users performing graphics-intensive work. However, the G773 does make the most out of its dot-trio shadow mask. For designing a company booklet, sales promo, presentation, or web page production, this monitor is suited to the job. Focus is sharp, helped somewhat by a fine dot pitch of 0.26mm,



and while there's usually a little degradation in focus from the middle to the corners of the screen, none was apparent here.

What most impressed us in terms of picture quality was the vibrancy of the colours produced. Controls are on-screen and include all the usual size and positioning adjustments as well as manual degauss and ViewMatch colour temperature modes. This last feature is important

as it allows the user to change the colour temperature on the monitor; something that needs to be done throughout the day if your work requires a high degree of colour matching.

The G773 is capable of running a non-interlaced resolution of 1,024 x 768 at a flicker-free refresh rate of 87Hz and has a viewable area of 15.8in. This is a highly ergonomic monitor which is both PC and Mac compatible. The screen is anti-glare coated, carries an EPA Energy Star rating and complies to that most stringent of standards, the Swedish TCO 95.

Lynley Oram

PCW Details

Price £499.38 (£425 ex VAT)

Contact ViewSonic 0800833 648
www.viewsonic.com

Good Points Vibrant. Sharp focus. Ergonomic.

Bad Points Not the cheapest 17in monitor around.

Conclusion Suited to the needs of the average small-business user.

★★★★

■ Hardware

Canon MultiPASS C20 and MultiPASS L90

Two multi-function devices. Choose your weapon: do you want big or small? Inkjet or laser?

For many people, multi-function devices represent the ideal solution for all their office equipment needs. A single unit can be used as a fax machine, a printer, a scanner and a copier. Recognising the versatility of such machines, Canon has released not one but two new models: the inkjet-based MultiPASS C20 (MPC20) and the MultiPASS L90 (MPL90) which is built around a laser-based print engine.

Of the two, the MPC20 is undoubtedly the more attractive. It is compact and stylishly designed but its flimsy plastic design gives the machine a rather cheap look and feel. On the other hand, the MPL90 is more of a well-built uncle than a big brother. It towers several inches above its sibling and has a considerable footprint.

In both cases, installation was straightforward, although I was a bit miffed by the six floppy disks I had to wade through (are CD-ROMs really that difficult to prepare?). The MPC20 uses a twin ink cartridge system, meaning there is a three-colour cartridge (containing cyan, magenta and yellow inks) and a separate reservoir for black. A simple slide-in toner cartridge sates the MPL90's consumptive desires.

Both machines use Canon's MultiPASS Desktop Manager software as a front end. The earlier version was cumbersome but this new edition rectifies many of the earlier problems. From the one simple interface you can perform scans, send and receive faxes and print documents so long as you've hooked up using a bi-directional parallel cable. Usefully, the program can also run in the background, popping up whenever one of its services is required.

To be honest, in general operation, the two units are really indistinguishable. Sending and receiving faxes is the same under software control and only different key locations separate manual operations. The most obvious differences show themselves when you start printing or copying. For text printing, the MPL90 cannot be criticised. Even at the smallest point sizes, characters were clean, crisp and eminently readable; hardly surprising for a 600dpi laser printer. Not only that but it's reasonably fast, managing around three-and-a-half pages per minute during tests.

Naturally, the inkjet MPC20 cannot hope to compete in terms of throughput but it puts up a good fight in the text quality stakes. I was amazed to find that I could read mono text right down to 3pt size, which is several points lower than you would usually need.

The MPC20's other big plus point is that it can print in colour. The machine is based on the print engine of Canon's popular BJC4200 printer, which boasts a top print resolution of 720 x 360dpi. On paper this sounds impressive and for splashes of colour it does work perfectly. But problems arise when trying to print large areas of dark colours. Even after tweaking the settings, the MPC20 seemed to be ink-thirsty which resulted in sodden and corrugated pages. Less acceptable is the obvious banding that appeared on almost every black or dark area, regardless of coverage or resolution.

Specification-wise the two devices share several features. Both use a 14.4Kbits/sec modem for fax operations, which means a potential send/receive time of six seconds, depending on the machine at the other end of the line. The scanning resolution is 400dpi in 256 greyscales, which is poor compared to modern colour flatbed scanners yet

Left Canon MultiPASS L90

Below Canon MultiPASS C20



better than competing multi-function devices.

Pitched as the heavy-duty solution, the MPL90 has a greater paper-feeder capacity of 250 A4 sheets (compared with 20 sheets

accommodated by the MPC20). It

can also store around 138 received faxes in memory, while the MPC20 can cope with a maximum of only 42. Speed dials have not been forgotten, with up to 120 finger-preserving shortcuts on the MPL90 and 50 on the cheaper inkjet model.

Canon has also seen fit to bundle a number of software titles with the MPs. Both come with Xerox's Textbridge OCR (optical character recognition) package and MPC20 buyers will also find CorelDRAW! 4 and ANDRoute 97 (route planner) in the box. A particularly dreadful Canon screensaver is also thrown in, so I repaid the gesture by throwing it out.

Scott Colvey

PCW Details

Price MPC20 £449 (£382.13 ex VAT); MPL90 £1,300 (£1,106.38 ex VAT) both are street prices

Contact Canon 0181 773 3173
www.canon.co.uk

Good Points MultiPASS Desktop Manager software is easy to use. Installation is a breeze.

Bad Points Noticeable banding on MPC20 graphic printouts. The sheer size of the MPL90.

Conclusion The MPC20 is an absolute bargain but the heavy-duty MPL90 is overpriced.

MPC20 ★★★★★

MPL90 ★★★



■ Hardware

VideoLogic Sonic Storm & Apocalypse 5D Sonic

Play your cards right. Choose a PCI sound card or a 2-in-1 card for graphics and sound.

More PCs are arriving with fewer ISA slots. More often than not, there are only two ISA slots available in the higher-end Pentium II machines and both are usually occupied by the only two add-in cards which seem to be using that particular bus nowadays — modems and sound cards.

As graphics cards move over to the AGP bus, it would seem to make sense for sound cards to finally start shifting over to the PCI bus, which is faster than the older ISA bus. It has a far larger bandwidth of 133Mb/sec, compared to the 7Mb/sec offered on the ISA side of the tracks. Indeed, more sound-card manufacturers are making the move, as are PC companies (Gateway has started installing PCI sound cards, in machines like the Ensoniq ES1370, as standard).

VideoLogic has taken all this one step further. The company has launched two new products: a PCI sound card and a 3D graphics card with incorporated sound. But regarding the latter product, we had to ask ourselves, is this necessarily a good thing?

Apocalypse 5D Sonic

The Apocalypse 5D Sonic combines 2D/3D graphics acceleration and PCI-based audio acceleration in one card. There's just not enough room on the blanking plate for all the audio and graphics connectors PCs currently use, so the gameport comes on a separate blanking plate. Installation is relatively easy. We installed the card in a brand new PC from Mesh, which used a Cyrix PR166MHz processor.

Bearing in mind that the card was tested on its base requirement of 166, and its performance may well improve with a faster CPU, the results were nevertheless poor. Before testing the card we had expected the scores to be different from those recorded by the Apocalypse 5D in our recent graphics card group test, as it was benchmarked on an Intel 166MMX which has a very different architecture from the Cyrix. However, given that the Cyrix has a higher clock speed (200MHz) the Apocalypse 5D performed less well than we had expected. Speed issues aside, it fell down on some of the tests, failed to reproduce any of the transparency effects in our benchmark test, and managed to support just seven out of the eleven 3D graphics features tested.

On the graphics side, it shares a similar spec with its soundless stablemate: a PowerVR-based NEC PCX2 processor for the 3D side of things,



while 2D graphics are looked after by Tseng Labs' ET6100 graphics controller. Essentially, this card is the fusing of the Apocalypse 5D and SonicStorm cards. It comes bundled with five games, ported to the PowerVR: TombRaider, WipeOut 2097, Ultimate Race, Terracide and MechWarrior II.

Sonic Storm

VideoLogic gets it right with this product. Anyone who has ever had to battle with a sound card to get it and its software installed will know what a frustrating and soul-destroying experience that can be. Not only did this sound card slip into its PCI slot with ease, but Windows 95 actually detected the new hardware and found all its software first time, without my making a single keystroke — and they say miracles don't happen!

The half-sized card claims to be SoundBlaster compatible. This was tested by playing Quake in DOS mode and the card did sound impressive. We also put it through the same tests as we used in a past group test (*PCW* June 1997). Our *PCW* MIDI file sounded brilliant on this, in comparison to other cards in a similar price range. Aurally, there was little to fault this card.

The Sonic Storm uses the Maestro-1 audio signal processor, manufactured by ESS Technology. It has a 64-channel audio stream processor and a 64-voice General MIDI wavetable synthesiser. A 2Mb wavetable sample file is stored in system memory and samples are transferred over the PCI bus. According to VideoLogic, this is a good thing as it removes both complexity and cost from the card itself. The

company is aiming this card at the gaming market, hoping to attract gamers with promises of faster frame rates, made possible because the hit made on the CPU using a PCI card is significantly lower compared to an ISA-based card.

Midisoft Studio 4 Lite, AudioRack and MixMan's 3-Mix are all included in the software bundle that accompanies this card, as well as a selection of trial versions of internet phone software. SonicStorm has driver support for Windows 95, DirectX and Windows NT.

Lynley Oram

PCW Details

Apocalypse 5D Sonic

Price £222.08 (£189 ex VAT) 6Mb version (4Mb SDRAM/2Mb MDRAM); £245.58 (£209 ex VAT) 8Mb version

Contact VideoLogic 01923 260511
www.videologic.com

Good Points Saves on PCI slot space. Great sound.

Bad Points Poor performance in our benchtest. Needs two blanking plates.

Conclusion A bizarre combination, but may have a home with manufacturers making compact PCs.

★★

SonicStorm

Price £69.33 (£59 ex VAT)

Contact VideoLogic 01923 260511
www.videologic.com

Good Points Ease of installation. Price.

Bad Points Software wavetable.

Conclusion Great value for money.

★★★★

Hardware

Intel Create and Share Camera Pack

Ride the new video-conferencing wave with this easy-to-install package of goodies.

Here's a new type of product you're likely to see more of. It's an all-in-one video-conferencing package aimed at the home user. In last October's *PCW* we focused on video-conferencing, the newest wave of the near future. Certain products, like the VideoLogic Captivator PCI, had just been released onto the market and we mentioned that it would only be a matter of time before there were more products in the same vein.

Enter Intel and its Create and Share Camera Pack. When a mega-corporation like Intel enters the fray you know it's serious about the technology, so it seems a safe bet to say that PC-based video-conferencing is now no longer just a fad for the early adopters.

Create and Share is a feature-packed product that incorporates a videophone, photo enhancer, image and video organiser, scene recorder, electronic postcard facility, and a fun, special-effects package called Kai's Power Goo.

Intel's Create and Share also comes with the hardware you need to get your system up and running, including a PCI video-capture card and a colour camera. Installing the hardware is easy and as long as you have an available PCI slot and are comfortable inserting the card, you'll have no problems. Once in place, all you have to do is insert the CD-ROM. The setup procedure walks you step-by-step through the setup.

Now I'm not one to willingly praise an installation process, but this one was very easy. It recognised the hardware, installed the software and was ready to go in the space of about ten minutes. It's too bad more products won't install like this. The only drawback with the hardware is the camera. Even though it may be unobtrusively designed, the focus of the images shown was somewhat blurry and disappointing.

The software bundle is a good start for any family that wants to get into video-conferencing and sharing images across the net, via email. Its video-conferencing facility uses Intel's long-established videophone technology. It is H.323 and H.324 compliant, which means it can be used on the internet via your ISP or in a direct-

dialed, point-to-point connection using your modem. The only catch is that you must have a 28.8K modem or better to use it.

The Videophone does actually work but I wouldn't advise trying a random call-up via the Intel conferencing site as it takes ages to find someone who'll answer your "call". The best method is to call a specific IP address or telephone number: that way you won't waste valuable phone time and money connecting to the recipient.

The other features of the package are handy and fun. You can record video clips using the Scene Record functions and transmit them via email. It also lets you take snapshots of whatever is on camera and send them, too, or you can

take these images and manipulate them using Kai's Power Goo.

Goo is great for kids and adults who like to make caricatures of friends and family. If you want to get a bit more sophisticated you can use Photo Enhancer. This is an image-manipulation package that lets you change images, for instance removing objects like clouds in the sky and retouching them to your preference. You can then upload these images to a web site, email them or use them in any other kind of fashion (for greeting cards, say).

Another internet-friendly feature is

NetCard: essentially a quick and easy way to send email with

attachments such as send images,

video and audio messages.

It is similar to using a mail package like IE3, except more user friendly.

All you do is drag and drop the image or video you want to send on to the "postcard",

perhaps add an audio message, type a message and send it all. It works with any email package so the recipient doesn't

need Create and Share to read it. All the images, video files and snapshots can be stored in the Gallery for easy access later.

This is a good package with an easy-to-use point-and-click interface that

didn't disappoint. If you're into more advanced packages, you may want to wait a while for the USB camera edition or the PCI 56K modem edition.

Dylan Armbrust



PCW Details

Price £176.25 (£150 ex VAT)

Contact Intel 01793 403000 www.intel.com

Good Points Good selection of software. Fun.

Bad Points Fuzzy focus with camera.

Conclusion A good start for the video-conferencing curious.

★★★

Hardware

Philips CDD3610

Desktop data storage par excellence. No oil painting but is this the CD drive of the future?

Philips has seen the future of CD and says it is re-writable. The company is phasing out production of its CD-R drive and replacing it with the new CDD3610, which writes to non-erasable CD-R and re-writable CD-RW discs.

It's not much to look at, the 3610: a standard IDE tray-loading form-factor drive that can slot in place of, or preferably beneath, your existing CD-ROM drive. But what CD-RW offers is a near-total solution to desktop data storage. With a CD-R/RW, the PC has three levels of storage: the hard disk for everyday work, CD-RW for expanding the hard disk capacity on special projects (image, DTP, internet, audio and video work spring to mind), and CD-R for final archiving or for sending the files off to someone else to use.

The early review sample came with Adaptec's Easy CD Pro/DirectCD and will eventually ship with a version of Easy CD Creator (reviewed in PCW Nov 97 issue) for more flexibility. Windows 95 doesn't properly support re-writable technology so DirectCD loads on startup and overlays Windows with the CD-writable function.



This is an almost transparent activity, creating Explorer windows for the CD writable drive that allows drag, drop and delete in the normal way, so the CD-R/RW disc is treated just like any other hard-disk, albeit with the slower speed of an optical drive. CD-RW discs can be re-written thousands of times without problems and the Philips drive writes incrementally so that regularly updated files are written in fresh areas of the disc. This means that no one area gets heavily over-used simply because it contains a file that is constantly being re-written.

Like CD-R, CD-RW media can be finalised so that they can be used on CD-ROM drives. However, since many CD-ROM drives were

made before CD-RW was developed they will not read the discs. If universal interchange is needed, go directly to CD-R. At around £15 a disc, CD-RW compares well with alternative removable media and is ideal for storing internet data or work-in-progress and then transferring it to outrageously cheap CD-R discs when you want to archive the files or send them out.

Tim Frost

PCW Details

Price Around £350

Contact Philips Business Centre 0181 689 4444
www.philips.com/pkm/laseroptics/cdr

Good Points The future for desktop removable storage.

Bad Points Slow CD-ROM read speed, so you still need a good CD-ROM drive.

Conclusion The combination of CD-R and CD-RW in one drive is simply too useful to ignore.

Hitachi GD2000 DVD drive

Speed is the essence of this new drive. Prepare for DVD-ROM, games, videos coming soon.

A good six months after manufacturers said that DVD-ROM drives were available, they are at last coming into the country in quantities large enough to supply the dealers.

This second-generation drive from Hitachi can now be bought off-the-shelf and its most important feature is its speed. The GD-2000 is a double-speed DVD drive and, since DVD runs eight times faster than CD-ROM, this brings it up to being the equivalent of a 16x CD-ROM drive. This is an important point since, at 16x CD speed, the GD-2000 can be used as a replacement for an existing CD-ROM drive in all but the most speed-hungry CD-ROM apps. (Note though, that many manufacturers hype up the CD speed by quoting "max" rates of 20x to 24x, while it may essentially be only 16x CD).

An added bonus of the GD2000 is that it is compatible with both CD-R and CD-RW discs, as well as both single and dual-layer DVDs. This makes it more of a universal player than older



CD-ROM drives which won't even recognise CD-RW, let alone DVD discs.

The drive interface is IDE/ATAPI so the GD2000 slots in place of an existing IDE CD-ROM drive. Windows 95/98 recognised the drive and ran it immediately at switch-on.

Unlike the other DVD packages, the GD2000 is available as a bare drive, without a DVD MPEG II Video decoder board. This makes it a strong contender as a "future-proofed" ROM drive suitable for a top-end MMX or Pentium II system. It can be used with any of the new generation of DVD-Video decoder card or software options becoming available and this particular drive is not

area-coded. That doesn't necessarily mean that you can play US DVD-video discs though, since the DVD video board or software will probably have the area code in it instead.

DVD-Video, ROM and games software to use on DVD drives are still in short supply but expect a big push in DVD movies, PC apps and games to start later in the year. If you want to go up in the ROM world now, this is a drive to do it with.

Tim Frost

PCW Details

Price £210 (£178.72 ex VAT)

Contact Hitachi 01628 585000
www.hitachi.com

Good Points Double-speed DVD drive.

Bad Points More than twice the price of a good CD-ROM drive.

Conclusion You need to be DVD-ready and this is a good choice.

★★★★

CorelDraw 8

Draw, Dream and PhotoPaint get top billing, but does this year's supporting cast fit the bill?

Since the first edition of CorelDraw, we've had a new version each year. Corel 3 pioneered the use of CD-ROM to accommodate the huge amount of resources and extras, and it has been growing steadily since.

What's in the box? No surprises here: it's big and the content is much the same as last year's, with the star acts being Draw (vector drawing and page layout), followed by PhotoPaint (image-processing and painting), and Dream 3D (3D modelling and rendering). The supporting cast includes OCR-Trace (bitmap-to-vector conversion and optical character recognition), Texture (layered texturing with lighting effects), Scan (wizard-driven scanning and image enhancement), Capture (screen grabs, including elliptical and freehand areas), Script Editor (macros), and Versions (archive management).

Other utilities include hardware colour management, a duplexing print wizard and a wizard for profiling settings for service bureaux. The 1,000 fonts come with Bitstream's Font Navigator 2, and there's a profusion of templates, photos and over 40,000 pieces of clipart. A standard install takes 245Mb.

Dream 3-D

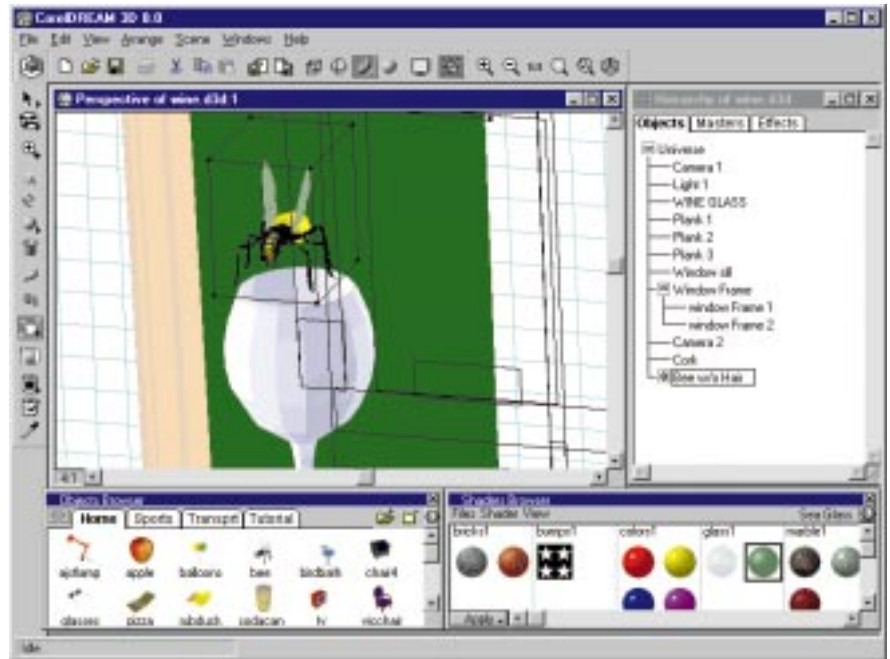
I'll dispense with the accessories to concentrate on the three

main performers. Dream 3-D is based on the well-known Ray Dream Designer.

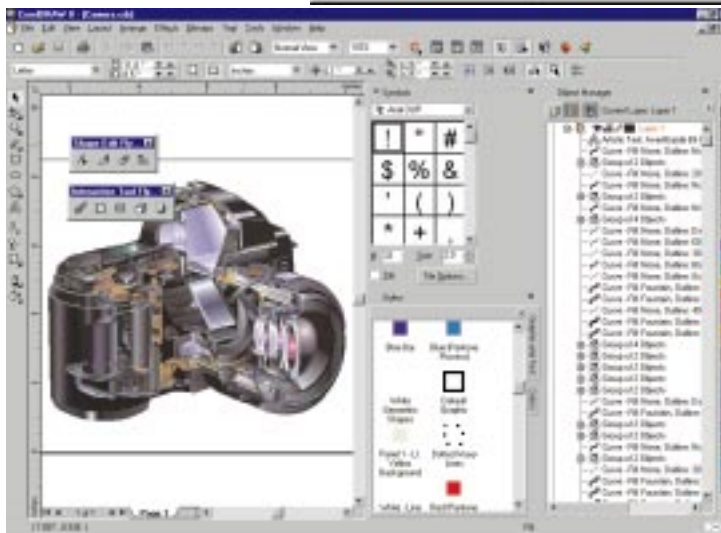
You have, by default, four windows: at the bottom are the drag-and-drop browsers for the 3D object and shader libraries; on the right is a tree-like hierarchy of objects and effects; and on the left of this is the working window.

Last year's model brought us VRML output for web pages, and this year's adds 3DMF.

There's an improved shader mixer, better light control and a new Cloudy Fog atmosphere. You can work in a semi-rendered preview mode but this was impossibly slow on the beta and, in terms of usability, Dream scores poorly against rival products.



Above Buzzing around in Dream 3D



Left The new-style Dockers can be extravagant with screen space

PhotoPaint

Turning to PhotoPaint, which started off as a rebadged version of Zsoft's budget PhotoFinish, but has grown over the years to offer professional features comparable to the high-end products from Adobe, MacroMedia and Micrografix. It includes floating, layered "objects", natural media brushes and pressure-sensitive pen support.

This version, in common with Draw itself, sees a number of interface changes. There's a new "flat" look, as in Microsoft Office, with controls that highlight as you move the pointer over them.

Rather more useful are Dockers: tabbed palettes, rather like those seen in Adobe products, which can float free or be docked at

any edge of the screen. These don't entirely replace Roll-ups but, like Adobe's, individual pages can be dragged out to float independently: the pages offer access to Objects, Channels, Scripts, the Recorder and the Tutors. The Tutor tab has the look and feel of a tiny web browser and the tutorial text is contained in HTML files, but this feature was still "under construction" in the beta. A Workspace feature enables you to save different customised interfaces and there's support for the Microsoft Intellimouse: holding down the wheel pans around an image; turning it, zooms in and out.

In terms of new features we've got proxy editing; saving time by working on a low-res copy of a bitmap and "rendering" the changes to the high-res image when desired. There are new filters, lenses and plug-in effects, and many of these can now be previewed dynamically straight on to the image, instead of in a dialog box thumbnail. An image stitcher will create a panorama from multiple files and the animated GIF format is now supported.

As for the painting tools, there's a new symmetry feature that lets you paint mirrored strokes, or radial patterns, by defining an axis of symmetry or rotation and the number of points. More fun can be had with Orbits. These add extra bristles to the brush tools that oscillate or rotate about the drawn path. Hence you can get all

sorts of twisted ribbon, DNA-style spirals and strange, tubular intestinal effects. These also work with the Image Sprayer that lets you spatter the screen with tiny images and which now includes more samples.

Draw 8 itself

We've covered the interface changes: flat look, Intellimouse support and the Dockers, which here include styles, view management, objects, symbols, scripts and two internet-specific panels. There seemed to be a problem here, as it was impossible to tab the Dockers together or expand a single one, with the result that it was seemingly unavoidable to fill the entire screen with them.

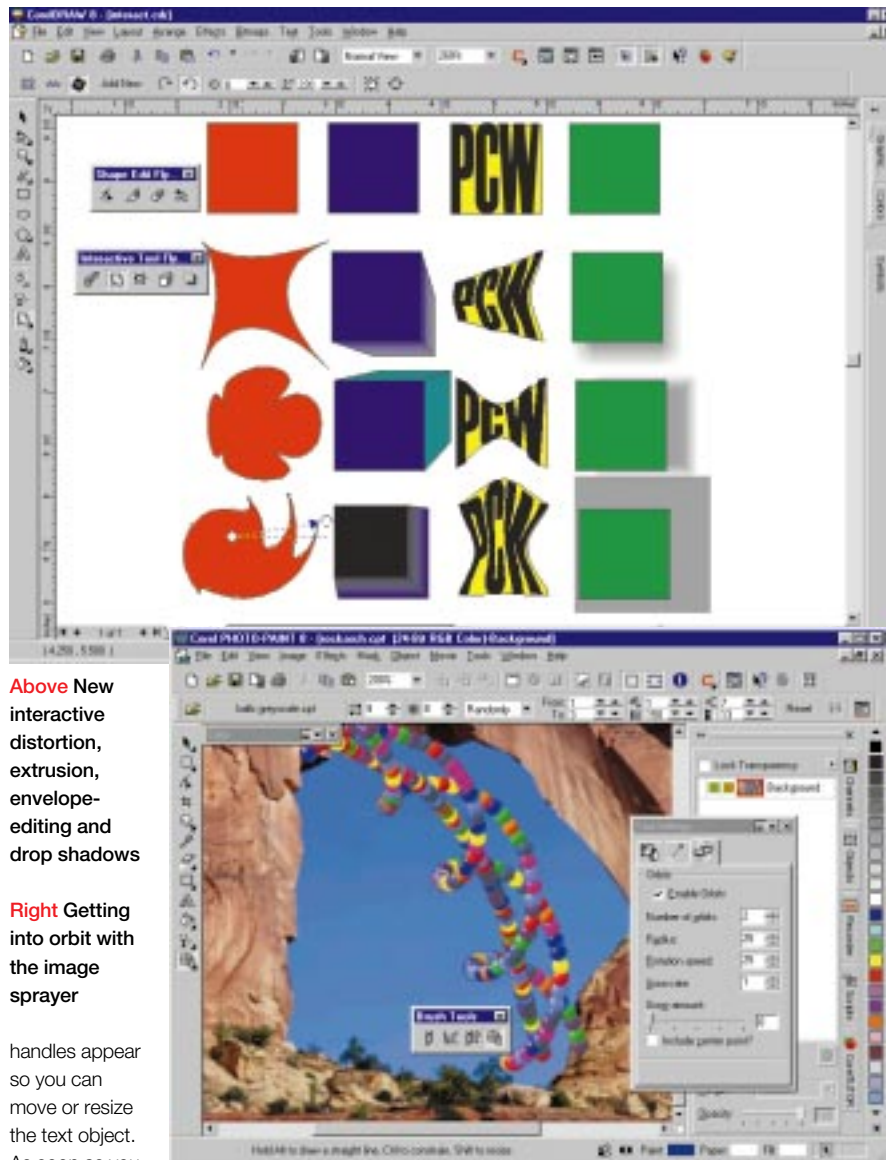
Moving on to drawing cheers things up somewhat. Picking from a stack of overlapping objects has always been tricky, but now you can hold down the Alt key as you click cycles through overlapping objects. Another great time saver is in node editing: previously, after you created a shape you had to switch back to the selection or node-edit tools to transform it. Now, with a shape tool active, you can edit the nodes and handles of an object without having to switch back. It also works on previously-drawn objects. Using the ellipse tool, for instance, the normal click-drag will draw a new ellipse. Click-release on a shape, however, and its handles will appear exactly as if you'd switched to the arrow tool. You can then tweak the object but still keep the ellipse tool current for the next action.

Last year brought new interactivity: real-time on-screen handle control of blends, fills and transparency that dispensed with dialog boxes and previews. Corel has built on this to offer more interaction. Envelope editing, where you distort the shape of an object or piece of text, is now far simpler: you just drag handles on-screen rather than mess with settings in a Roll-up. The same process applies for extruding 3D effects and adding drop shadows — all the relevant options appear in the context-sensitive property bar.

Brand new on the interactive front are the three distortion tools. The Zipper distort adds a zig-zag edge to an object, the Push-Pull distort bends segments of an object and the Twister distort does what its name suggests. It's all very subtle. The direction and length of the interactive handles affect not just the intensity of the effect, but can switch between concave and convex modes. Better still, you're not constrained by symmetry — you can weight the effect to apply more strongly in different directions, giving natural-looking swirls and petal effects.

There's also an interactive stepped colour control. Click on an object with the Control key held down and colour will be added in ten percent tint stages. You can import and "in-place" edit and render 3D objects, although this didn't appear to be fully working yet and the 3D TextArt effect mentioned in the release notes was nowhere to be found.

Other improvements to text handling include a feature that resizes fonts to make a block of text fill a frame exactly, saving much trial and error. Another neat touch is that if you pause while entering free-range Artistic text, the sizing



Above New interactive distortion, extrusion, envelope-editing and drop shadows

Right Getting into orbit with the image sprayer

handles appear so you can move or resize the text object. As soon as you start typing

again, you're back in text-entry mode.

The Undo feature now goes beyond file saves: a welcome addition to anyone who has inadvertently saved changes they didn't want. Another safeguard is that you can now lock individual objects to protect them against accidental change. Previously you could only do this to an entire layer of objects. Duplication has been improved, too: previously you had to set the automatic placement of a duplicate from a dialog box, but now if you move the first duplicated object, subsequent ones will inherit the same relative placing which makes it much easier to create repeating patterns.

Finally, there's more web support, including access to Corel's ftp site direct from the Scrapbook clipart browser and a "Make HTML compatible" feature that removes text formatting that could cause problems with browsers.

After last year's tidy-up of the interface and speed enhancement, this version is a bit of a disappointment. The combination of interactive tools and the property bar is excellent but other parts of the interface should be taken out and shot. The Dockers are a good idea in theory, but

seem poorly implemented and compete for screen space with the profusion of roll-ups. My copy of the beta took three times as long to redraw the same picture as Corel 7. With a scheduled release date only five weeks after the date of the beta, this does not bode well.

Tim Nott

PCW Details

Price £464.13 (£395 ex VAT) to be confirmed

Contact Corel 0800 973189 www.corel.com

System Requirements Windows 95 or NT 4.0, P90 (133 recommended), 16Mb RAM (32Mb recommended), 80Mb disk (245Mb recommended).

Good Points More flexible drawing. Excellent interactive tools.

Bad Points New dockers add further confusion to the interface, and performance (at least in beta) is well down on version 7.

Conclusion On a first impression, not one of Corel's better years, but the final verdict will have to await the release code.

★★★

Software

Personal
Computer
World
Recommended

Microsoft Money Financial Suite 98

Financial advice, online banking, it'll even eliminate your credit card debt (no readies, though!).

It's less than a year since Microsoft tempted us with Money 97. Now, with the 98 version there's another chance to swap *our* money for more of *its* Money. Is it worth it? That depends on which version you buy. Here, we're looking at Money Financial Suite 98 (for £20 less you can get Money 98 Standard, which leaves out the financial planning aspects and some reports).

The big selling point of Money 97 was its online banking facility. Here in the UK there was only one taker, Barclays Bank. But now Nationwide has joined, too. That's it for the time being, but you can expect other banks and financial institutions to get involved soon, so check with yours if you're interested in this facility. If you're a Royal Bank of Scotland customer, you can import data into Money 98 but as yet you can't connect directly.

But even if you're not interested in online banking, there are other features in the new Money that are worth consideration, especially if you have internet access.

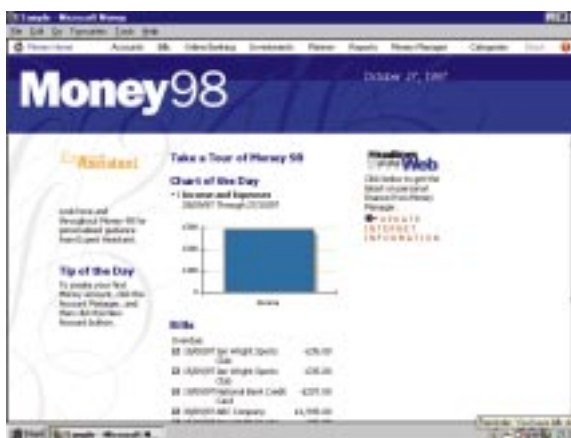
Money is no longer just an accounting system, it can now take over your entire personal finance portfolio, look after your accounts and offer support on everything from your stocks to your mortgage. This becomes apparent when you start Financial Suite 98 and view its home page (the interface is seemingly a web browser, complete with frames). The home screen shows summaries of your assets and liabilities, gives the current balances of your bank accounts and offers financial advice such as *change your mortgage*, or, *pay some bills*. The clever part is that this advice is "live" — Financial Suite makes its recommendations on the basis of its analysis of your account details.

For example, based on the latest mortgage rates, the program will identify whether you are paying too much and alert you to the possibility of refinancing your mortgage. For this to be as accurate as possible, you need to give the program details of your assets, liabilities and



The Money 98 home screen summarises all you need to know (and some things you'd rather not) about the state of your finances

is the invoicing module which you can also use for credit notes, quotations and pro-formas. It's biased towards sellers of goods rather than services, in that it reveals item codes and unit prices



Forthcoming income and expenditure can be checked quickly and accurately

financial goals, like investment plans and pension provision. It can even handle one-off targets like

wedding expenses. You get help with income tax self-assessment, too.

There's a Debt Reduction Planner which offers to create a plan to eliminate your credit card debt. And there are several useful work sheets including home inventory, loan and mortgage, tax and pensions, although none of them have live links to your accounts.

For further help, the text of many UK-specific financial articles are there to browse. Some are updated when you connect to the internet from within Money 98, as are tax and mortgage rates. The provision of information in this way is invaluable, yet relatively easy for software publishers to include. Let's hope it sets a trend.

If you invest in the stock market, there's Microsoft Investor to track and automatically update the value of your portfolio and let you research other investment opportunities online. Another useful feature for budding entrepreneurs,

on its printed forms (which are acceptably formatted for a small company). It's dislocated from your bank accounts, needing its own asset account to be set up to hold both invoice amounts and payments. But there is an automatic routine to transfer receipts to your bank account, where you can set up appropriate income categories. It's ideal for startup sole-trader businesses but don't expect to be able to carry out business analyses as easily as using dedicated business accounting software.

Cheekily, Microsoft has included an upgrade Wizard to open a Quicken file in Money 98, convert the data into Money 98 format and let you start using the data immediately. For those who outgrow Money 98's embryonic business features, Microsoft has provided an upgrade path to either Sage Instant Accounting or Sage Sterling — Money 98 is file-compatible with both.

James Taylor

PCW Details

Price £49.99 (£42.54 ex VAT)

Contact Microsoft 0345 002000

www.microsoft.com/Money

System Requirements 486DX, Win95, 12Mb of RAM, 25Mb hard disk space (+6Mb for Microsoft Internet Browser), CD-ROM, modem.

Good Points Online banking and updating facilities. Sage compatibility.

Bad Points Some of the help still talks in dollars.

Conclusion Your own personal financial assistant at a laughably low price.

★★★★★

Software

Norton AntiVirus 4.0 Deluxe

Now all DOS, Windows and NT users can have the ultimate protection against vicious viruses.

Symantec's Norton brand is the leading name in utilities, yet in the anti-virus market it has so far not achieved the success of McAfee in the US, or Dr Solomon's in the UK. Knowledgeable buyers recognised its lacklustre detection rates. But that bugbear was laid to rest in early 1997 with the release of version 2 for Win95 and NT. Now Symantec has updated the software for DOS and Windows 3.1, and packaged all versions in one box. The result is Norton AntiVirus 4.0 Deluxe, one of the strongest and most complete anti-virus packages you can buy.

The software installs from CD-ROM, which also includes AVI videos of information on viruses and how to use the product. Setup installs the appropriate version for the platform you're running. During installation you're prompted to create a set of rescue disks which you can use to rebuild your system following a destructive virus attack. If you're connected to the net you're asked if you want to download the latest virus definitions. This feature, LiveUpdate, lets you get virus updates free, for the life of the product.

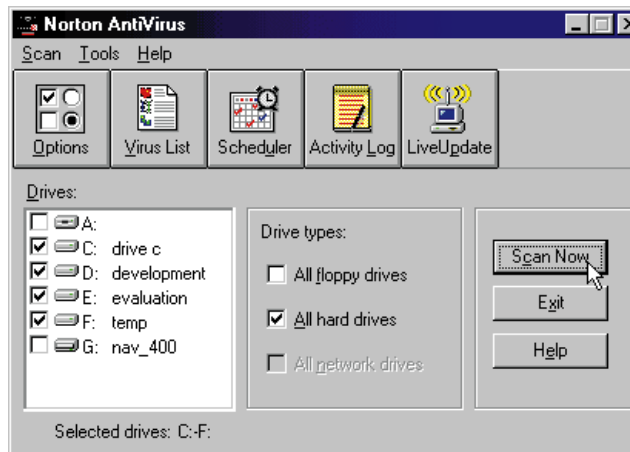
Like all virus scanners, updates are important to maintain the software's effectiveness at detecting new viruses. LiveUpdate can retrieve not only new virus "signatures" but also extensions to the scanning engine which may be needed to deal with completely new types of virus such as those written in Java or VBScript.

All versions of Norton AntiVirus sport an identical interface although the DOS version is rendered in text mode. To check your PC you choose which drives to scan and click Scan Now. You can also scan drives, folders or individual files using the "Scan with Norton AntiVirus" option on Explorer context menus, or run regular checks using the Norton Scheduler. When run in this way the program minimises, and displays a small message box on completion to tell you all is clear.

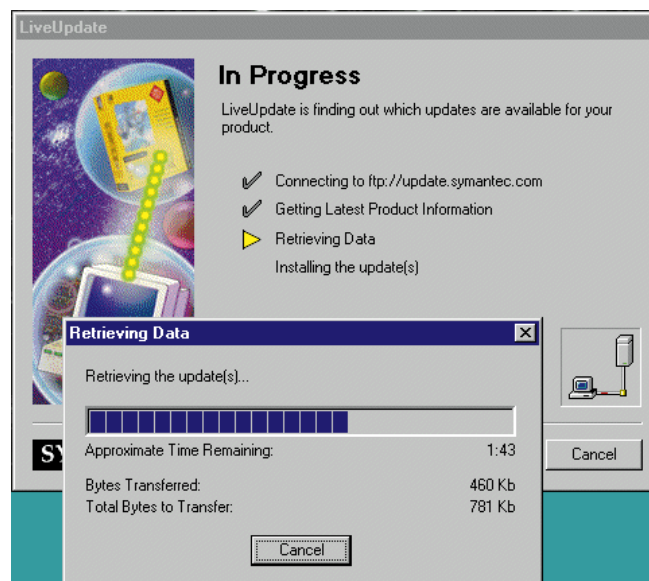
The software includes Auto-Protect, a resident scanner which works in the background to check files when you run, copy or move them, or when they arrive as an internet download or email attachment. Auto-Protect makes it impossible to run an infected file (at least not one it can detect). When a virus is found, the screen clears and a text mode warning appears, with options for proceeding. The Repair option can be used to disinfect a file there and then, although not all viruses are successfully removed.

Auto-Protect can warn you about virus-like activities such as attempts to write to a hard disk's system areas, or format the hard disk. It checks your disc drive for infected floppies and can check if you've left a floppy in the drive when you shut down so you don't accidentally boot from an infected disc.

Right The user interface, based on the Windows 95 version, is consistent across all platforms



Below Using LiveUpdate you can download new virus definitions over the internet



Norton's Inoculation option (integrity check) lets the software see if a file has been modified, perhaps by an unknown virus. Inoculation is applied only to system files by default. Program files are more likely to be modified by a new application's setup program, which would result in false alarms, but if you can live with this you can enable this extra level of protection.

What sets Norton AntiVirus apart is the amount of customisation allowed. For both the scanner and Auto-Protect you can choose how to be alerted when a virus or suspicious file is found and what options should be available for dealing with it. There's even an option for tuning the virus scanner's sensitivity. Corporate users will particularly appreciate the ability to customise alert messages and password protect the options to prevent tampering.

Norton AntiVirus uses similar leading-edge techniques to other top products and delivers a

top-notch virus detection rate. "Striker" allows encrypted viruses to run safely in protected memory so they decrypt themselves, allowing them to be accurately identified. "Bloodhound" uses heuristic methods to sniff out possible new viruses. Symantec claims that it can even detect most unknown macro viruses (to date, Dr. Solomon's is the only other product that claims to do this).

For those seeking virus protection, Norton

AntiVirus 4.0 is a safe choice. It's easy to use, highly effective and is easily updated via the net. AntiVirus 4.0 deserves to become the market leader — its developers have done a good job.

Julian Moss

PCW Details

Price £69.33 (£59 ex VAT)

Contact Symantec 0171 616 5800

www.symantec.com

System Requirements 386, 4Mb RAM, MSDOS 5, 9Mb disk space, CD-ROM drive.

Good Points Easy to use. Highly effective. Free updates via the internet.

Bad Points Updates are expensive on disc.

Conclusion One of the best anti-virus products you can get.

★★★★★

Software

ClarisWorks 5 Office

You don't need acres of memory and disk space to make it work well for your business needs.

Office software is generally considered to include word processing, a spreadsheet and a simple database. Integrated software of this kind is usually called "Works". Bigger packages bundling separate, more powerful, versions of these programs usually incorporate the word "Office".

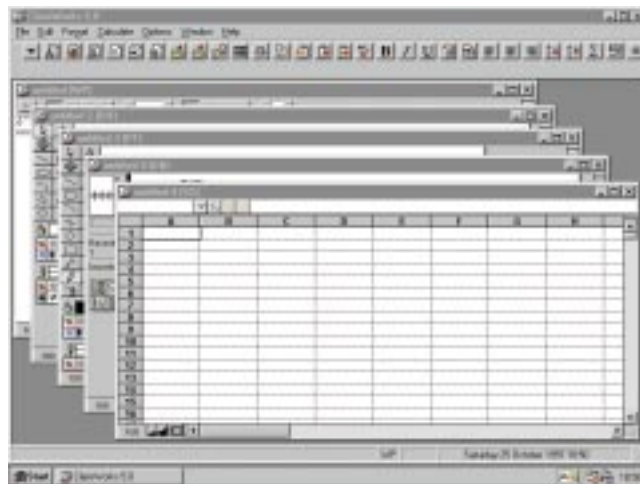
The *de facto* standard for office software is undeniably Microsoft, currently pushing Office 97. But it's an expensive, big application and even the cut-down small-business edition demands 195Mb of your hard disk space and has many features that smaller businesses might never need. So, if you're in this category take a look at this version of ClarisWorks Office instead.

At the core is the new ClarisWorks 5 which features links to the net, plus enhanced HTML document translation to take advantage of it. If

you haven't yet signed up with an internet service, there's a PipeX Dial trial offer in the box. Also in the box is a copy of Claris Home Page Lite (web publishing package) and a large quantity of ready-to-use document templates including JIAN BusinessBasics from the business planning software publishers BizPlanBuilder, justifying the Office epithet.

ClarisWorks 5 includes word-processing, spreadsheet, database, drawing and painting programs. The graphics lend it presentation capabilities so you can combine words, graphs, tables, photo images and video on a single page. As well as its own native formats, ClarisWorks can read and write in most other popular formats, too, including Microsoft Works and Word, WordPerfect, Lotus, and graphics files.

There is an impressive number of document templates, or stationery already set up with text, pictures and other formatting options which can be changed if you so choose. Ready-to-use documents include newsletter layouts, financial worksheets, databases, presentations and web page templates. Apart from its own templates, it also offers a selection of more than 60 business documents from JIAN BusinessBasics. These include templates for agreements, worksheets and checklists for sales, marketing, finance, accounting and general management. They were originally created for use in the US so you might need to check whether they are suitable for use in



Left As well as the more usual office functions, ClarisWorks 5 includes painting and drawing programs

Below, left There is much useful pre-defined stationery, including the JIAN BusinessBasics sets

the general-purpose default. You can edit these bars, add new buttons to open documents or web pages, play macros or

launch other programs in order to gain immediate access to all your files without leaving ClarisWorks. For example, you can additionally set up a button bar that will be saved with a document so the correct shortcuts are available when needed.

Other novelties in ClarisWorks 5 are the Access Menu which lets you use the keyboard instead of the mouse to navigate to various palettes (could be useful for some portable computers); and the Texture palette which lets you edit textures as well as patterns and save your customised palettes.

Obtaining telephone support entails the unusually tiresome routine of ringing one office to register and then another to get help. Both systems are afflicted with voicemail. Support wasn't able to answer our three questions, kept us waiting for ages and then cut us off. Perhaps you'll have better luck?

James Taylor

the UK. Stationery uses a different suffix (.cws) from documents (.cwk) and irritatingly doesn't let you look for both when opening documents.

For your own documents, you can call on ClarisWorks Assistants for detailed step-through help in the automated creation of everything from newsletters and tables to mailing labels and business cards. For publishing on the net, you get a new ClarisWorks HTML translator with support for gif and jpeg images, background images and tables, plus ten new templates for single page web sites.

You can also install Claris Home Page Lite which, among other features, will publish multi-page sites. Unfortunately, the version included does not qualify for support from Claris (but you can upgrade to the full version). Home Page Lite is not installed automatically with ClarisWorks; you must browse the CD to find it.

Claris is proud of its new ClarisWorks button bar. You get four mutually exclusive bars for the internet, the Assistants, document formatting and



PCW Details

Price £116.33 (£99 ex VAT. Upgrade £57.58 (£49 ex VAT))

Contact Claris International 0345 413060;
www.claris.com/intl/uk

System Requirements Windows 95

Good Points Versatile word processor. Useful stationery and templates. Low price.

Bad Points Fragmented installation routines. Meanness in supplying only a light copy of Home Page.

Conclusion Even if you don't need the ability to exchange files with other users, or the cross-platform compatibility with the Mac, Office is still a bargain. It needs less memory and disk space than others: ideal if you're starting up a business on less-than-leading-edge equipment.

★★★

Software

Claris FileMaker Pro 4.0

Mac-like, powerful, easier to use than other applications and now with instant web publishing.

Designed for the Mac and ported to Windows, FileMaker Pro is easier to use than the likes of Access or Paradox. Much of its complexity is hidden behind straightforward dialogs using plain English terms. For example, FileMaker has only one text field type, which stores up to 64,000 characters. By default, indexes are silently created as needed and every word in a text field can be indexed. Other databases managers make you specify field size and indexing, and have separate unindexed memo fields for longer text. FileMaker's approach is intuitive and powerful.

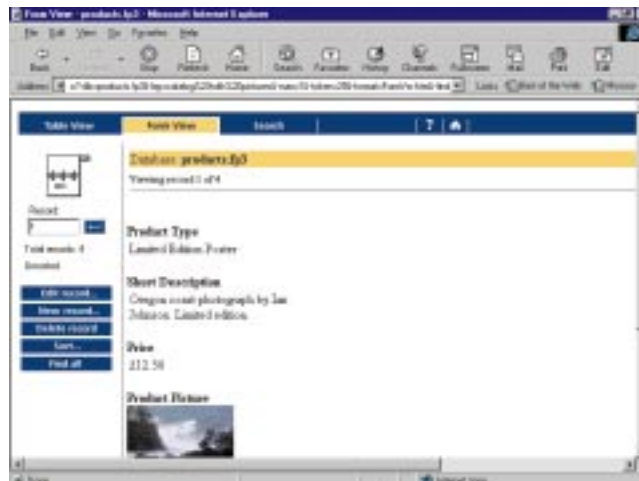
Another strong point is that the same "layout" (form) designer is used for forms and reports. When you create a new database, FileMaker creates a default layout that handles viewing, editing, listing and printing records.

Any layout can be put into Find mode, which blanks out the fields for you to type in the values you want to match. Click Find and FileMaker displays just the matching records. Layouts can easily be customised by adding buttons to automate your work, say. There is a large range of pre-defined

actions you can attach to a button, or you can write custom scripts using ScriptMaker, a point-and-click dialog which lets you create sophisticated routines visually, without having to remember keywords or parameters. FileMaker was designed as a sophisticated flat-file database, although relational features were added to the last version.

None of this is new and little has changed since version 3.0. There is one major innovation; an internet feature called the Web Companion. Dynamic data publishing allows web browsers to execute queries against a proper database as opposed to simply viewing data in static HTML files. Traditionally, offering this type of access is difficult, since you need to create programs that run on a web server and generate HTML on the fly. Claris has side-stepped much of this work by making FileMaker itself into a web server.

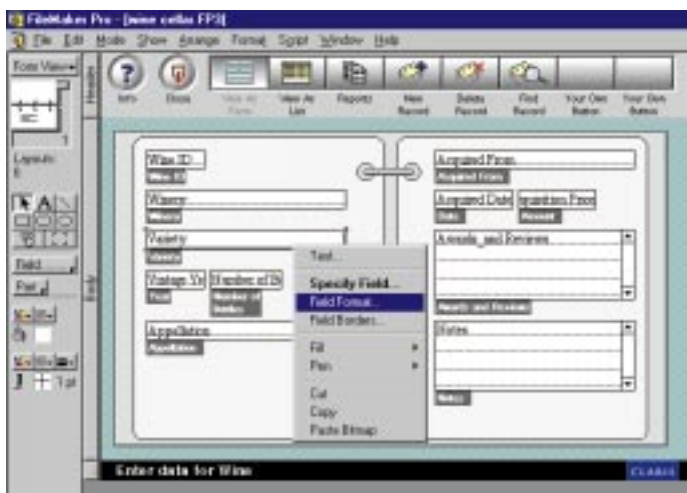
If your PC has a TCP/IP address, either on the web or on an intranet, publishing a FileMaker



Left Browsing a database using FileMaker's Instant Web Publishing

Below, left This layout uses drawing objects to create a notebook-style background. **Right-clicking** a field pops up a customisation menu

Once you leave the comfort zone of Instant Web Publishing, FileMaker is not really any easier than other



database is a snap. At a minimum, all you need to do is check the box that enables the Web Companion plug-in. Web browsers that navigate to FileMaker's URL will see a home page that lists all open databases. Selecting one of these presents the data in a simplified layout, with searching and editing features. There are even Java applets that simulate FileMaker's data browsing tools. You can control which fields are displayed by configuring Web Companion to show data from a particular layout. Fuller control is available by writing your own web pages using CDML (Claris Dynamic Markup Language).

There are limitations to FileMaker's web publishing. FileMaker scripts do not work over the web, so more complex applications require JavaScript embedded into HTML files, as in the supplied examples. Although access passwords are respected, Claris warns that "all files in the web folder can be accessed, replaced, or even deleted by savvy web users".

solutions. Even so, FileMaker's web features should light up the eyes of anyone wanting a simple way to publish data, particularly on an intranet. We tested it on a network both with Mac and Windows systems and in moments the Macs were happily browsing a database hosted on Windows NT. The great advantage is that no additional client software need be installed (and presumably neither are client licenses required).

For full internet publishing you need a permanent connection and a fixed net address. Users of dial-up accounts must use FileMaker's static HTML export instead. FileMaker is great for ease of use, but be cautious before adopting it for custom database applications. And, it remains weak on Windows integration. FileMaker does not have tooltips. There is no ODBC driver and no connection to ODBC databases, no support for ActiveX, and DDE only as a client, not as a server. FileMaker remains a Mac alien in a Windows world. Despite this, it is still the best choice for non-technical users who want to manage data and share that data on an intranet, too.

Tim Anderson

PCW Details

Price £233.83 (£199 ex VAT). Upgrade £116.33 (£99 ex VAT)

Contact Claris 0345 413060 www.claris.com/uk

System Requirements Windows 3.1 with Win32s, Windows 95 or NT.

Good Points Genuine ease of use, including web publishing. More powerful than it first appears.

Bad Points Still looks like a Mac application. Windows integration still weak.

Conclusion The best end-user database but quirky in a Windows environment.

★★★★

Software

Microsoft MSN 2.5

Will this latest e-zine-styled online service from Microsoft be enough to attract the punters?

The web today is like television was in the thirties: it works, but only enough to give us a glimpse of its potential; it has users, but not yet so many as to pump in serious money; and nobody is quite sure what is to be done with it.

This uncertainty is evident even at the most basic level: your connection. There are two types: direct, where you are put straight onto the web to wander at will; and value-added, where a gateway to the wider web is part of a package of services built around a community of users. It's the difference between going straight to the bus station when you head out of town, or dropping in first at the pub next door. The pub can make a lot of money if it can attract the punters.

CompuServe and AOL pioneered the value-added model, but they began as closed non-web online services. It is by no means clear how the model will develop, or even survive, in the free-for-all of the web, where communities tend to arise spontaneously on the basis of common interest.

Nevertheless, two of the most powerful people in the world, Rupert Murdoch and Bill Gates, saw the model as a way of selling content for profit. Both have set up value-added web connections in Britain: Murdoch/BT's Line One, and Microsoft's MSN.

If you find this worrying, be reassured that the web is too big even for these heavyweights to control and they could screw up badly. Microsoft has already done so several times. It set up MSN as an old-style closed service and had to scrap millions of dollars worth of infrastructure when Gates did his famous U-turn towards the web.

It missed out on \$200m of publicity when it failed to have MSN ready for the Win95 launch. The first UK version of MSN software went so far overboard on special effects that my home PC simply refused to run it. Even on faster PCs, they grew so irritating that I by-passed them.

It seems, according to US reports, that I was not alone and that MSN has had problems attracting people to its content. There are even rumours, denied by Microsoft, that Gates wants to sell MSN. Yet MSN deserves credit for trying to push forward the boundaries of what is possible



Left & below left MSN's magazine style demands a lot of resources



on the web. The content, much of it originating in Britain, is variable, but sometimes very good. Often the design goes over the top, but how else do you define limits? The gaming zone is popular: chat rooms are populated by novel cartoon "avatars" and there is an excellent, though heavily US-orientated, magazine called Slate.

MSN had a harder task than CompuServe and AOL, which built a huge captive community of users before opening up to the internet. It compensates by grabbing its users as soon they log in and trying to hold them on-site. The opening screens offer a host of attractions but no obvious way to enter a web address. I'd bet there are MSN users who have never discovered the web beyond the home site.

Some users like this approach but it can be aggravating to people like myself who use the web continually as a source of information. The content is still largely suitable only for fast lines and high-spec machines, which could be

construed as Microsoft refusing to compromise. Its e-zine style, like much other web content, will not be comfortable to use (and therefore commercial) until delivery speeds rise by an order of magnitude. This goes too far for the push channels Microsoft has introduced with its Explorer 4.0 browser,

incorporated (along with the new Outlook Express email module) into the latest version 2.5 of the MSN software.

But infrastructure developments are coming faster than they did with early TV, which had World War II to contend with. Digital broadcasting, which will gain impetus next year, will change radically the way such content is delivered and read, and providers will have to change with it. MSN is already doing so, making much of its content available free to browsers (see www.uk.msn.com/portal/default.asp) or via an IE 4.0 channel. It wants to prime an audience for future commercial services.

So what is the point of joining MSN? The answer is that its prices are on a par with those of the no-frills providers. Once you have figured out how to use a standalone browser, you can take or leave the content and use MSN as a plain web link.

Clive Akass

PCW Details

Price £14.95 a month, unlimited use; £4.95 for three hours a month, plus £1.95 each extra hour; £149.50 per annum

Contact Microsoft 0345 002000
www.uk.msn.com

System Requirements Windows 95 and 14.4Kbps modem. 28.8K modem or better. At least 16Mb of RAM.

Good Points Well-produced if erratic content.

Bad Points Interface gets too tricky and needs a fast connection.

Conclusion Reasonably priced web link with some good added attractions, but demands a lot of resources.

★★★

Software

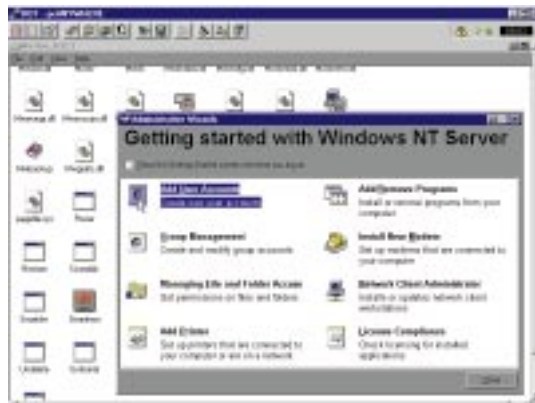
Symantec pcANYWHERE32 8.0

Remote access software is on the up and up and now there is better integration with Win NT.

This latest version of pcANYWHERE32 integrates caller authentication with Windows NT's user and group authentication for extra security if you are connecting to an NT box. It includes support for LiveUpdate, a simple method of updating the package via the web.

For those unfamiliar with the program, pcANYWHERE allows users to remotely connect to another PC, via modem; or by using a network which can be a LAN (local area network); or, if the remote machine is attached, via the internet.

The upgrade from 7.5 to 8.0 adds some useful features including some aimed at making the NT administrator's life easier, such as the fact that the program will now log on to NT's Event Log, so the administrator can see who has connected. pcANYWHERE now integrates desktop videoconferencing using CU-SeeMe 3.0, which allows multiple remote PCs to simultaneously connect to a single host.



NT, running by remote control on a Win95 machine — you hardly notice that you are working remotely

There are a number of minor changes, too, which increase ease of use. For instance, the video resolution of the host computer can be automatically switched to match that of the remote machine without the need to go through the Control Panel, and the remote mouse can now be set to automatically match the remote machine's left- or right-hand mouse setting, or to

respect its current settings — it makes life easier for those of us with left-handed colleagues.

Combine the new features with those already present in pcANYWHERE, such as fast connection times, the ability to transfer files and to remotely control a machine and a decent terminal emulator, and this program stands out as an excellent piece of software and once again takes the lead in remote-control access software.

Ian Wrigley

PCW Details

Price £163.33 (£139 ex VAT) host and one remote. Upgrade £69.33 (£59 ex VAT)

Contact Symantec 0171 616 5600

www.symantec.com

System Requirements Win95, NT3.5.1 or better.

Good Points Better integration with Windows NT. Video resolution synchronising.

Bad Points Hard to find any!

Conclusion A great product, ideal for anyone who needs remote access to another machine.

★★★★

IMSI WinDelete 97

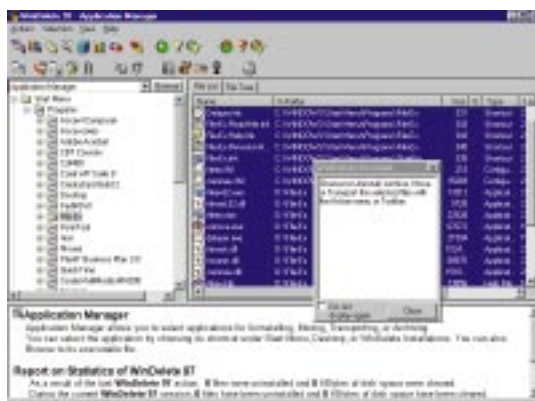
Delete those unwanted Windows apps with ease and style! But keep your wits about you.

Deleting Windows applications can be tricky. Manual deletion can leave unnecessary files on your system, where they consume disk space. WinDelete 97 includes facilities to monitor installations so they can later be cleanly removed. It also lets you archive, delete or move applications and files.

Using the Transport feature you can remove an application from a computer, copying it to archive diskettes for subsequent installation onto another computer. When you don't want to remove an application, but still need to delete some files, the CleanUp Wizard could prove useful.

With this tool you can search for, delete or duplicate empty files, backup files and temporary files, unused files, invalid shortcuts, ScanDisk .chk files and internet cache files.

When your system has been analysed you are shown a list of the selected files for deletion. It's important that you review this list: when using any



Use the application manager for an Explorer-type view of your applications and files

deletion application, you must know what you're doing; it's not unusual for it to suggest deletion of files that you subsequently find are needed by another application. Should a mistake happen and a required file is removed, it can be restored if you have enabled WinDelete's Undo Buffer or uninstalled using WinDelete's Archive mode. You

can screen your autoexec.bat, config.sys, win.ini and system.ini files for invalid information using the Integrity Check tool.

Three useful applications are included with WinDelete 97: MacAfee VirusScan, Retrospect WinPack (compresses and decompresses zip files) and Silverlock WinTuner which analyses and tunes aspects of your system's performance.

Steve Cottrell

PCW Details

Price £34.99 (£29.78 ex VAT)

Contact IMSI 0181 581 2108 www.imsiuk.co.uk

System Requirements Windows 95 or NT4.0.

Good Points A useful set of tools which, if used intelligently, are easy to learn and use.

Bad Points You need to keep your wits about you.

Conclusion WinDelete 97 will help you perform your housekeeping.

★★★

Software

i publish 2.0

Painless and easy DTP for the novice — but don't expect to become a press baron just yet.

If you thought the Wizard-based approach of Microsoft Publisher (and others) was a painless introduction to the complex world of DTP, Design Intelligence's i publish would like to challenge that. Designed for outputting to paper, web pages, and on-screen presentations, this takes the automated template-based approach to the limit.

Start up, and you are presented with a choice of ten document types: choose one and you get a range of sub-choices in thumbnail view, of layouts and "scheme sets" (style and colour combinations). Clicking on a combination shows a larger preview.

Having made your choice, the preview expands to show your document and the control window contracts to four tabbed pages: Start, which you must have; Grab, for adding your own text and graphics to the placeholders; Design, for altering colours, fonts, picture placement and so on; and Publish, for outputting to paper or



Online clipart from the web-browser control centre

electronic format. The innovative bit is that this control window is actually a web browser. You can drag and drop files from your hard disk, from the CD-ROM and, if connected to the internet, from Design Intelligence's online gallery.

Moving on to the Design tab, you can change font and colour schemes from thumbnails. If you want to format a single component, however, you have to go through the menus. Although the

schemes are well-designed, there's little flexibility: you don't specify font size, but choose between Normal, Large, Larger or Huge.

In theory the program takes care of all layout problems for you, but I didn't find it that clever and the facilities for resizing text and picture blocks are limited. It takes some of the uncertainty out of creating smart-looking publications, but there's little scope for the more ambitious.

Tim Nott

PCW Details

Price £59 (£50.21 ex VAT)

Contact Design Intelligence 0118 981 4230
www.i-publish.com

System Requirements 486, 16Mb RAM Win95, 65Mb disk. Internet Explorer 3.01 or later (incl).

Good Points Easy thumbnail-driven layout creation.

Bad Points Little creative choice for the more ambitious.

Conclusion Easy and fun, but it won't teach you anything about DTP.

★★★

FreeSpace

Disk space — the final dump to clear. Here's an easy file compression utility that works well.

Compression dramatically increases the amount of data you can get onto your hard disk, but it has drawbacks. A compressed partition can slow down performance and you risk massive data loss if this big file gets corrupted. Techniques like zipping files are less worrisome but tedious. But FreeSpace's third approach lets you pick and choose what you compress.

FreeSpace's single-floppy installation makes no deep-rooted system changes. In order to work, first Windows and then FreeSpace must load, so you cannot compress system files, the Windows folder or FreeSpace itself. Nor will it compress over a Win95 network. The FreeSpace Manager is simple: tell the QuickSpace wizard how much space you want to save and on which drive, and it will come up with a suggestion. Once you've accepted, the program goes into action. The compression takes a while but this is really all you need worry about. You can, if you want, choose folders and files



Simple, effective. A refreshingly non-technical interface

manually for compression. Other options and utilities let you verify compressed files, or uncompress them. You can even bypass the FreeSpace Manager and compress folders from the right-click menu.

Following compression, the only difference you should notice is that compressed files are in blue text in Explorer, and drive and folder property sheets have an extra FreeSpace tab,

showing the savings made. The files themselves continue to behave as normal. Files saved to, or moved to or from a compressed folder are automatically compressed/decompressed.

Does it work? In brief testing, results were good with between 35-60 percent savings and even loading a 50 percent compressed 10Mb executable showed little performance hit. But with hard disk prices below £100/Gb, FreeSpace isn't that economical for sub-gigabyte drives.

Tim Nott

PCW Details

Price £39.95 (£34 ex VAT)

Contact AstroSoft 0149 4533393
www.mijenix.com

System Requirements Win95/NT 4.0, 8Mb RAM.

Good Points Beautifully simple to use and, in limited testing, worked well.

Bad Points None encountered.

Conclusion Cautious users might want longer-term testing, but the first impression is excellent.

★★★★

Software

ZipMagic VS Zip It 4

Zipaddee-doo-dah! Two file compression utilities reviewed: something old and something new.

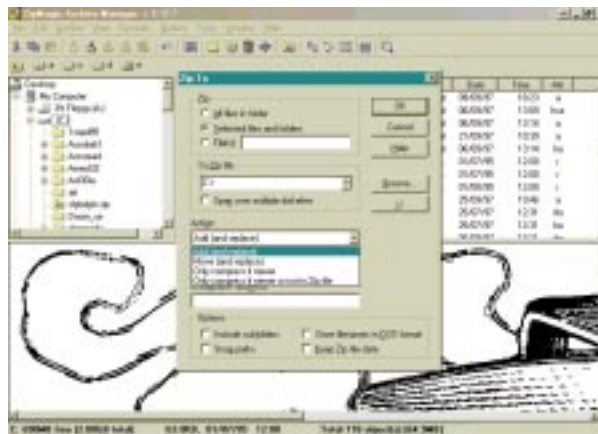
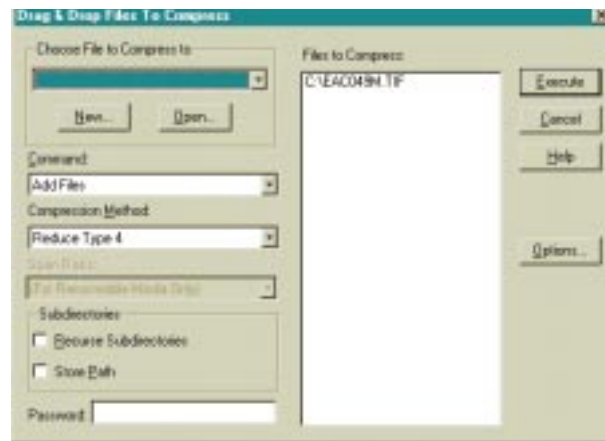
ZipMagic is a new, impressive and easy-to-use compression utility. Its ease of use is down to the Archive Manager, which looks like the familiar Windows Explorer, but with added functionality and a file viewer. To archive files, just launch the Archive Manager, highlight the files you want to compress and click on Zip To in the drop-down menu. A dialog box appears and you simply create a new archive and name it, or choose one from those you've previously created and — hey presto! — you have an archive of compressed files.

Files can be added or moved to an existing archive: adding files leaves the original uncompressed file in place, while moving a file creates a compressed version and deletes the original. You can also specify Maximum, Normal, Fast, Super-Fast compression or None. If you see zip files in any of the following formats: Z, GZ, TAR, TGZ, LHA/LZH, ARJ, and ZOO; ZipMagic will convert them for you.

There are several useful tools, including a neat feature which tests the integrity of a zip file so if a recipient can't open it, you can see if the fault is yours or theirs. You can also add comments to a zip file and make a self-extracting archive. And, there's the great Archive Manager: you can view your desktop, drives, folders and files using a Tree List and File List; but it also includes the archive management tasks so you can view the contents of every archive compressed by the formats supported by ZipMagic. You can extract files by dragging them to the desired destination, view files inside archives and perform many other management operations.

Zip-It has been around for a while but though it has some nice features, version 4 is not as easy to use as ZipMagic and lacks the Archive Manager. Nevertheless, it integrates well with

Windows Explorer (as does ZipMagic) and all you need do is highlight the files for compression, right-click your mouse and provide the archive destination. One click on a button and you have a



ZipIt is good (Top), but not quite as good as ZipMagic (above) which is easy: just select the files for compression and, a few mouse clicks later, you have a compressed file

compressed file — quick and easy. However, if you launch Zip-It itself, you are faced with a dauntingly blank dialog box.

I can't say I'd recommend a new user to choose Zip-It over ZipMagic, but existing users will certainly want this upgrade. You can view and convert to Zip, ARJ, LHARC, and GZ formats.

You can drag-and-drop files into a compressed archive and Zip-It will also archive a folder and its contents (and sub-folders) into a ZIP file at one go. As with ZipMagic, you can create a self-extracting file.

One big advantage of Zip-It is a new plug-in for Netscape Navigator/Communicator and Microsoft Internet Explorer that allows you to view the contents of a ZIP archive in a browser window. Individual files can be viewed or extracted or the archive saved to disk. You can also connect to a server on the net which supports the I-Zip protocol, display and browse the contents and extract individual files without having to download the entire archive.

Paul Begg

PCW Details

ZipMagic

Price £29.99 (£25.52 ex VAT)

Contact AstroSoft 0149 453 3393

www.mijenix.com/zipmagic.htm

Good Points Easy to use. Good range of features, tight compression and an enhanced Explorer, too.

Bad Points Nothing comes to mind.

Conclusion Excellent product — and this is only version 1. What are they going to do next?

★★★★★

Zip-It 4

Price £29.99 (£25.52 ex VAT)

Contact Quarterdeck 0645 123521

www.quarterdeck.com

Good Points Quick, efficient. Good net integration.

Bad Points Not as easy to use as it could be.

Conclusion It does the job and does it well, but ZipMagic has the edge.

★★★★

Result and You Don't Know Jack

Parties and PCs were chalk and cheese, until now. Gather round as the PC becomes your quiz inquisitor.

Calling anyone throwing a Christmas party this year and racking their brains for games to play — PCW has the answer. Why bother creating a quiz when someone else can do it for you, with sound, lights and pictures? Stick a quiz CD into the PC, sit the players down in teams, and clear off to the kitchen for that well-deserved triple sherry. Quiz CDs are the new “orange and balloon” game!

Result is a new one from the BBC, a quiz hosted by Desmond Lynam (aka The Coolest Man on Television) that tests your sporting knowledge. It draws on years of sports coverage from the BBC archives, mixing questions that use audio and video clips with straightforward sporting trivia.

BMG Interactive has released an updated version of **You Don't Know Jack (YDKJ)**, previously only on sale as YDKJ Lite. It doesn't stick to any specific subject; rather, it poses questions about high-culture couched in low-brow terms, e.g. “Which one of the following headlines taken from a 17th century tabloid, is written in iambic pentameter?” Unlike Result, there are no video or audio clips, it is presented as a game show rather than a straightforward quiz, and it is hosted by the suitably smarmy Jack Cake. Up to three contestants can play. In YDKJ, as with Result, the questions run the gamut from a cinch to an impossibility.

Although Result loudly trumpets the involvement of Des Lynam, he features surprisingly little. Having briefly introduced you to the game, he passes the odd comment on your answers and appears at the end of a round to tell you what he thinks of your score, usually in a clichéd one-liner comparing your progress to that of a footie team. Desmond is justifiably worshipped by millions for his ability to host marathon-length sports programmes while going out live to millions with a producer screaming down his earpiece, but unfortunately he couldn't make this script sound natural to save his life.

In contrast, the host of YDKJ is absolutely inspired. Jack Cake has a gag for every answer, right or wrong, and I played for a few hours



Left Among the 3,000 questions on the Result CD, there may be a few you can answer

Below YDKJ may be jokey, but don't let that fool you

Occasionally a question arrives that is particularly simple, yet the vast majority can be answered only by the sports-obsessed: e.g. “Which diminutive Welsh flyweight champ was known as ‘the ghost with the hammer in his hand’?”

The main flaw with Result is its lack of imagination. The

game designers had the chance to design a sports quiz with the potential of an interactive medium, yet they seem to have just copied all the components of A Question of Sport onto a CD and left them there, with little attempt to make it an engaging experience. Even if you love sport, the uninspiring gameplay wears a bit thin. Rather than pack the game full of footage and commentaries from the last 30 years, the multimedia element is used sparingly. Too many questions are anagrams, or hangman. The game's designers have also had a problem synchronising the sound with the video (no matter what I tried, I couldn't correct it). This is most noticeable when Des Lynam speaks to camera, although there were recurring problems with other graphics during the game.

The bottom line is that even if you play solo and can't answer a single question, YDKJ and its host put on a great show. But to enjoy Result, you will need a knowledge of sports as sound as Des Lynam's presenting abilities.

Paul Trueman

without hearing any question twice. Whether he's asking questions in up to five accents in the same sentence, or cracking risqué gags when you and your friends get it wrong, one can only marvel at the amount of time and effort taken and the seamless way it is all stitched together. In the introduction to YDKJ, a man called Murray prepares the contestants (that's you), while all the hustle and bustle of a pre-show countdown goes on in the background, before the producer's voice calls out “Lose the desktop...and...fade to black”. The graphics are perfectly in sync with the clean, crisp, sound and the effects lull you into thinking that you really are in a show. There are breaks in between questions, filled by the end of the gag from the last round, plus chatter from Jack and each question number's customised jingle (there are up to 21 questions).

In Result there is a similar length of time between questions but nothing to look at, other than a small graphic showing the question number, and the same burst of music is played each time.



PCW Details

Result

Price £29.99

Contact BBC Multimedia 01483 204450

www.beeb.com

System Requirements Windows 95

★★

You Don't Know Jack

Price £29.99

Contact BMG Interactive 0891 515555

www.bmginteractive.com

System Requirements Windows 95/3.1

★★★★



p112 >

Encyclopedia of History

From man's early beginnings to the present day; you can learn history by reading the 'news'.

It's no mean feat to provide an informative journey through history, from the first scratchings in earth's primeval swamp to that of Pathfinder and Sojourner on Mars. Doring Kindersley has succeeded.

What, for me, always let Doring Kindersley (DK) products down was the content. It was slender. A bit like nouvelle cuisine: DK titles looked good and tasted good, but hardly satisfied the hungry mind that wanted steak and kidney pud with three veg.

Lately, DK titles have been getting better and this is one of the best I have seen. It recounts the events of world history, from the earliest foraging in the antediluvian mists through to the present day, as if it were being reported in a newspaper.



The newspaper headline style lends interest to the information

This is an approach to reporting historical events that many teachers have adopted in the classroom, so the concept will be familiar to children.

At first glance, finding the information you want looks fiddly: you seem to have to click on

icons that fly through a window towards and past you. In fact, you can search for the word you want, click on it and be taken to a page where the appropriate news story can be read.

The depth of additional information is quite impressive. Clicking on "Books of the Dead" takes you to a page which explains that the Ancient Egyptians buried their dead with a book that was believed to be an instruction manual for the afterlife. From here, you can get an explanation of Egyptian religious beliefs and other information.

Overall, a useful introduction to world history, well presented in a format children will understand. Good stuff.

Paul Begg

PCW Details

Price £29.99

Contact Doring Kindersley
0171 836 5411 www.dk.com

System Requirements Windows 95

★★★★



Sightings UFOpedia

Keep your eyes peeled and it's amazing what you'll see. But watch out for those Men in Black.

Sightings is an encyclopaedia-style collection of paranormal and supernatural investigation. All the topics have been taken from the American television series, US Sightings, which informs the public about a range of extraordinary phenomena, from UFO encounters to government cover-ups. This CD has been compiled from "authentic" evidence and tries hard to explain the forces behind cases such as the Roswell incident and the mystery of the crop circles.

A comprehensive database of more than a thousand global UFO sightings can be searched by location and date and includes video footage never before seen. You can link into the Sightings web site to maintain the database, and there is a facility for you to submit any sightings you may have encountered (genuine ones, please!).

This CD will appeal to all who are interested in aliens; from those with a consuming passion for the subject, to the merely curious. A lot of so-called "evidence" is brought forward and it is quite exciting to see it for yourself. The video footage of the Roswell Alien Autopsy is fun, even if it does look slightly false. There is also a 3D walk through a top-secret military base, enabling the user to gather classified information through



Many references are available, from UFOs to crop circles to the darkly mysterious MIBs

expert interviews on the Roswell incident, and a look at the possible implications of alien technology on human beings.

For all you Men in Black film-fans there is a section dedicated to them (Will Smith not included): apparently there have been many reports of strange, oriental-looking men wearing black suits and driving soundless black cars,

threatening death to those who have encountered species from other planets if they dare reveal their stories. But even after these warnings victims have told all, and the bizarre death threats have not been carried out. Is this a story of fantasy, or of cowardly men dressed in black who scare people for a laugh? Who knows, but the truth is out there!

Etelka Clark

PCW Details

Price £29.99

Contact Anglia Multimedia 0500 600191
www.anglia.co.uk

System Requirements Windows 3.1,
Windows 95 and DOS 5.0

★★★

Software

Monopoly Star Wars

Can you get out of a galactic jail, free? Is the Imperial Palace worth more than a hotel on Mayfair?

This is one of the programs chosen by Intel to prove that its latest processors are a match for console machines when it comes to delivering playing power. The graphics are certainly impressive.

You choose a Star Wars character to play Monopoly, which has been restaged in the Galactic Empire. Figures move around the board in a realistic 3D world and the characterisation is excellent.

Children can find CD-ROMs difficult if there are not enough clues about what to do. But with Monopoly and the Star Wars trilogy, they are on familiar territory.

Working out how to play was easy. C3PO is the banker and the computer carries out all the game functions like throwing the dice, moving pieces and overseeing the auction of property. Even though this takes away useful tasks like adding dice and counting out your move, it did speed up the game because arguments over



dice throws, or where your counter was, became irrelevant. Colonies and starports replace houses and hotels and street names become chunks of the Galactic Empire with names such as Tatooine, Endor and Dagobah.

Memories of the traditional board-game Monopoly still influenced what property the players bought. "I've got the Imperial Palace,

which is Mayfair" said one player.

In addition to the game itself, there are 200 film and music clips from the Star Wars trilogy included. Because our testers were not followers of the Star Wars cult, they clicked to omit these as they appeared. But the option to play with or without movie clips would have suited them better.

Games can be saved, and they can be played against friends, the computer or across the internet. Monopoly Star Wars seems ideal for these latter options.

Debbie Davies

PCW Details

Price £39.99

Contact Hasbro Interactive 0181 569 1234;
www.hasbro.com

System Requirements Win 95.

★★★★

Super Jewellery Kit

Jewels with a personal touch, but no precious stones. Luckily, it's the thought that counts.

Anglia Multimedia has recently brought out a whole range of PrintPak products consisting of packages with which children can be creative, using the computer. The latest one is the Super Jewellery Kit which allows children to design their own earrings, necklaces and brooches and make them into the real thing.

In addition to the CD-ROM, the contents of the pack includes Print and Shrink paper, a plastic substance form which your jewellery will be made: a small bag containing leather thongs, earring backs and butterflies, and some brooch clasps.

There is a small pot of liquid, which waterproofs your creation, and a couple of pieces of double-sided sticky tape.

The idea is to choose the item you would like to make, design it, print it out on the Print and Shrink paper, pop it in the oven for a couple of minutes and then add any fasteners you may need. It seems easy, although there are a number of hassles involved.



To start with, you must use a colour inkjet printer (a laser would melt the special paper). Also, it is much better if you have a scanner handy, as most of the patterns are designed to take photographs. But when the accessories run out you have to pay £10 for a refill pack! I really don't think a sheet of plastic, some pieces of aluminium and a bit of double-sided sticky tape should amount to that much?

The whole process is slightly fiddly. Trying to cut out the design, once printed onto the plastic, was a nightmare because the material kept splitting. Baking it in the oven was nerve-racking because I was continually expecting it to explode at any time. My end result didn't look too good.

PCW's Adam Evans volunteered his face to grace my brooch, but somehow I shrunk it to the size of pea.

A good idea but naff and seriously overpriced — check out my brooch (pictured, left) for evidence!

Etelka Clark

PCW Details

Price £19.99

Contact Anglia Multimedia 0500 600191;
www.anglia.co.uk

System Requirements Win 3.1 or Win95. Mac 68030 or better. PowerMac 7.1 or better.

★★

Software

Chaos Island

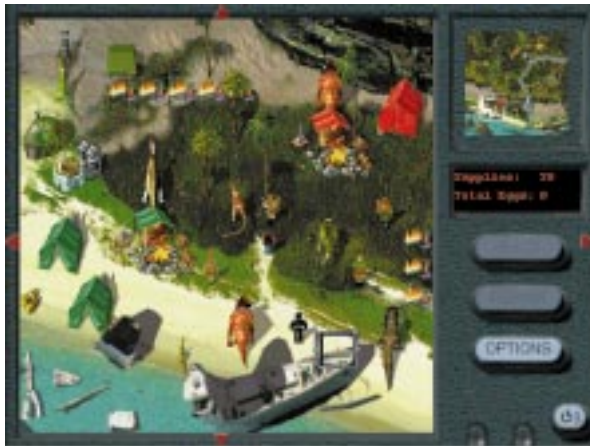
The words "research" and "strategy" don't usually spell fun but this CD-ROM breaks the mould.

As a merchandise platform, Jurassic Park has simply run and run. How well does it transfer to CD? Very well, according to the enthusiasm of our testers.

Chaos Island is a strategy game based on the idea of researchers stranded on a remote island inhabited by dinosaurs. This time it is Isla Nublar, where our team of scientists pit themselves against enemy dinosaurs and evil hunters in a fight to save the island and their research.

Chaos Island owes much to the films Jurassic Park and The Lost World. Celebrity voices include Jeff Goldblum as your lead scientist and Vanessa Lee Chester as Sarah, his girlfriend.

What makes the game a success is the innovative way in which players breed dinosaurs and co-opt them onto their team. Having selected your team members, your first task is to



establish base camp, find supplies and the artificial nest and begin hatching eggs. Your decisions have a strategic dimension such as: where to build camp, which team members to send out on scouting missions, whether to breed herbivorous dinosaurs who will clear the vegetation or carnivores who will fight enemies and hostile dinosaurs.

As well as strategy, the game tests directional and map reading skills. Colour coding is used to signify the location of friendly dinosaurs, supplies, and enemy hunters and dinosaurs. When team members tire, you return them to base camp to rest. When carnivorous dinosaurs flag, you prepare dinner by shooting a few enemy hunters.

There are 12 missions, each with three difficulty levels. As each becomes more treacherous, the enemy dinosaurs get bigger and more terrifying. Once our testers had overcome their qualms about feeding dead hunters to the dinosaurs and nicking dinosaur eggs, they couldn't get enough of this game.

Debbie Davies

PCW Details

Price £29.99

Contact Microsoft 0345 002000;
www.microsoft.com

System Requirements Win95.

★★★★

How does it work?

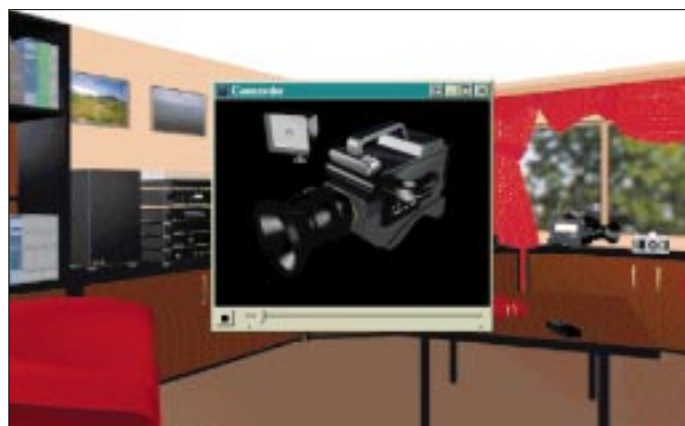
Had you ever wondered how a toaster pops up a pop-tart? — No, neither had we, until now.

A favourite theme of science fiction is postulating some disaster which leaves people without the trappings of modern civilisation and wondering how they would cope.

Could they make something as simple as a match? It is a fascinating concept because most people are profoundly ignorant about how everyday things work. Once you realise that you haven't got the faintest idea how, say, a video camera works, your curiosity makes you want to know. And that's the appeal of this CD which explains how more than 100 everyday things work; from a lavatory to your video.

The explanations are short and not particularly clear and, given that school-age children are possibly more likely to turn to this CD-ROM than their parents, this is a fairly major mark against it.

In case I am thicker than I think I am, when I say the explanations are not clear, I have in mind the following, which I didn't find in the least enlightening: "Focuses light onto a target plate covered with a layer of photoconductive material that conducts varying amounts of electricity, according to the amount and colour of the light that shines onto it. The photoconductive material is scanned point-for-point across the plate by



electronic circuitry, and the image on it is coded into a stream of electrical signals." This explains how a camcorder works? Not to me it doesn't! However, not all the explanations are this complicated and it is fun to see how the more simple things work, such as a door lock or how an electric toaster pops up the toast.

All 100 objects are found in the rooms of a 3D walk-through house, which is fun for kids to use as it encourages knowledge through exploration. If you just want to see how the loo works, there's

an index, from where you can go straight to it.

The video animations showing how each object works were very good but there was no way in which you could copy a picture or the text to another document (for inclusion in a school essay, perhaps).

Paul Begg

PCW Details

Price £19.99

Contact Koch Media 01256 707767;
www.koch.co.uk

System Requirements Win95 only.

★★

■ Hardware

HP DeskJet 500

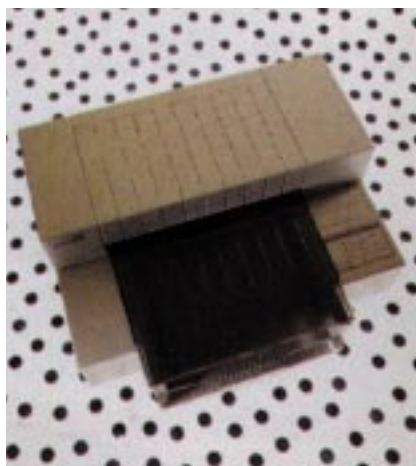
This printer has gone the distance and has shined in almost every respect. And it's still going strong.

Back in 1991, I decided to upgrade my 9-pin Star LC10 dot-matrix printer. I noticed that the HP DeskJet 500 had been highly acclaimed in nearly every review. This was very encouraging, and prompted me to buy one.

For some strange reason, my greatest reservation at the time had been its lack of support for continuous-feed paper. Now, I can't even remember why this was a such a concern. Like most people, all I use at home are A4-sized sheets of paper.

The other main contender back then had been the Canon BJ-10C, but its portable design lost out in favour of the solid build of the DeskJet 500, with its integral sheet feeder. I am certain that this sturdiness has been the main reason why this printer has had such a long and productive life, outliving three PCs.

Compared to today's models, this isn't a fast machine. A speed of 4ppm is quoted, but this is only achieved when printing text using the internal fonts. Luckily, speed was never a major concern of mine. Quality of output is more important, and



the DeskJet 500's output has always been high enough for me, which is one of the reasons why I have kept it for all these years. Its 300dpi output, while relatively low in comparison with some of today's offerings, is still good enough for printing general correspondence or reports.

Unfortunately, the quality of its monochrome half-toning is poor, making it unsuitable for printing true colour bitmaps. Mostly, I stick to printing text, line-art and vector images.

The other main reason for my devotion to the DJ500 is its compatibility with everything, from DOS to the latest Windows applications. Even my Psion 3C has a driver for it. Also, I have no trouble getting hold of consumables. Because of the Hewlett-Packard name, these are available over the counter in most high street stationers.

KD Brent

PCW Details

Price Discontinued (£499 plus VAT in 1992)

Contact HP 01344 369222 www.hp.com

Good Points Reliable. Highly compatible. Availability of consumables.

Bad Points Resolution. Colour support.

Conclusion A good second-hand bet.

★★★

■ Hardware

US Robotics Pilot 5000

Did this Pilot pass with flying colours, crash land, or never get airborne in the first place?

The Pilot is an endearing little machine, capable of turning heads

with its pen input and compact design. The "Can I have a go?" crowd can be staved off easily with their ignorance of Graffiti, but this language barrier is clearly a concern for prospective users. In practice, it took me seconds to master each letter and a few hours' worth of fiddling to be reasonably confident with writing basic text. Extended characters are achieved by two shifted character sets which can be seen on the reference card or on the pop-up keyboard. It has been claimed that the handwriting recognition can approach 100 percent, but I usually achieve about 75 percent.

Connectivity to the desktop is a feature that

USR was keen to stress and it is very well implemented. The Pilot comes with a cradle that plugs into your serial port, and transfers are conducted by loading the HotSync manager on your desktop and just pushing the button on the cradle. The simplicity of this system is truly admirable and is only likely to be upset by a shortage of serial ports on older PCs or COM port

conflicts with modems.

The supplied software is merely adequate, including a diary, memo pad, address book, calculator and task manager. There are small disappointments in the calculator which has no

scientific functions, in the memo pad which can not store more than 4,096 characters including spaces, and in the pitiful alarm. These limitations can be overcome by third party software, which is easily available on the internet and simple to install with HotSync. Additional functionality can also be added by third party fax, database and money management programs.

Aiden (surname not supplied)

PCW Details

Price Product no longer available. Pilot Personal £219 (£186.38 ex VAT); Pilot Professional £299 (£254.47 ex VAT)

Contact US Robotics 01734 228200 www.usr.co.uk

Good Points Battery. Size. Weight. Connectivity to the desktop.

Bad Points Software. Low quality of supplied stylus.

Conclusion Truly pocket-sized, and easy to use.

★★★

■ Software

Delphi 3

A quick-as-a-flash compiler and object-orientated programming on tap. Watch the Help files.

Delphi is a visual programming language, competing directly with Visual Basic. I've been using Delphi since version 1 and have been using Delphi 3 for the past six months.

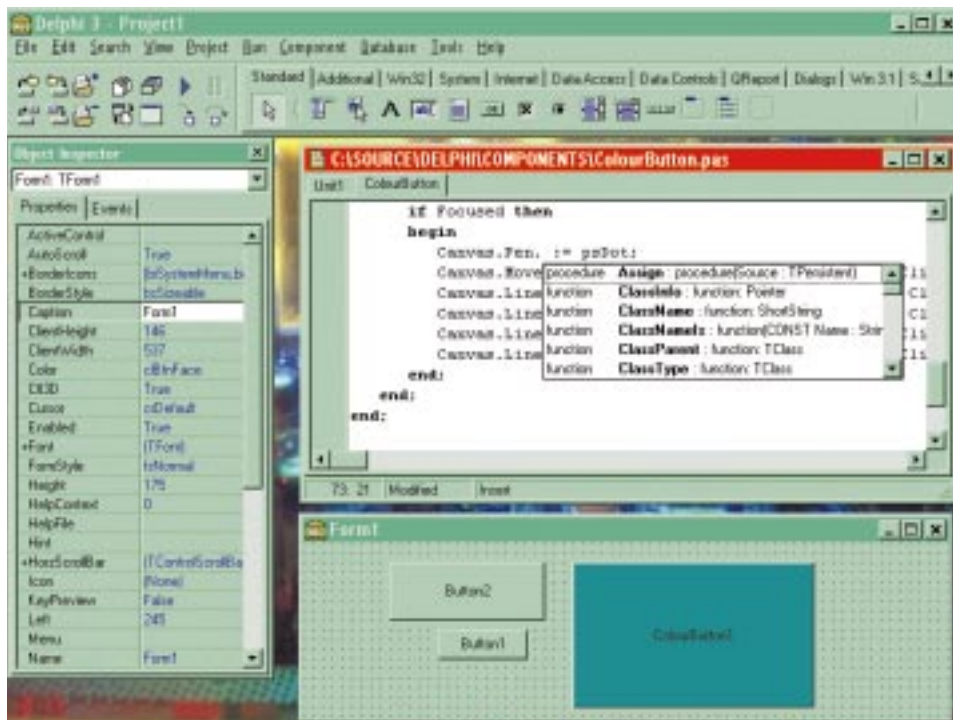
Delphi 3 and Visual Basic 5 have very similar features, but Delphi has one great advantage for programmers trying to write reusable, maintainable code. It is object-orientated, and has been built from the ground up as an object-orientated tool, not as an afterthought.

The Visual Component Library (VCL) encapsulates all the Windows controls in easy-to-use components. Borland has been quite poor at encapsulating some of the Windows 95 controls such as the Rich Edit and List View controls, but if a VCL component doesn't contain some of the functionality you require, it's simple to derive your own component, add the functionality you require and install it back into the Component Palette.

Another object-orientated feature that initially seemed to be a bit of a gimmick is form inheritance. Now, after using this feature, I've realised how useful it can be. For example, I have a dialog box form from which every other dialog box is derived. Now, if I'd like to make a foreign language version of my software, I'll need to change the wording on the OK and Cancel buttons. With form inheritance, I can just change the wording in the base dialog box form and that's it. A bit easier than changing it in 20 to 30 places, don't you think?

Also gimmicky but useful is the Code Complete feature. Type in the name of an object and a list of its properties and methods will appear. Click one of the methods and tool tip will show the parameters taken by the method. This saves traipsing through the help files, which have been notoriously bad since release 1 and have not improved tremendously.

Delphi comes with a native code compiler, which must be the fastest compiler of any development tool. This means, for simple projects, all you need to ship is the EXE file. However, if you require database support, you'll need to ship the Borland Database Engine. The code produced does seem to be quite large, compared to that produced by products such as Visual C++.



Fast worker: Delphi has a very fast code compiler, and is the best visual programming tool around

On the downside, Delphi 3 does seem to be a little less stable than its predecessors are. Often, after a bug has occurred, it's necessary to leave Delphi and come back in again. Fortunately, I haven't lost any of my code yet.

Overall, I continue to be hugely impressed by Delphi. I can't think of one example where I have been unable to achieve something because of the limitations of the tool. It usually comes down to me being stupid or Windows preventing me from doing what I want to do. Some people are of the opinion that Delphi is harder to learn than Visual Basic, but I don't know if this is true. If you're likely to be coding from within Word, Excel etc., then using Visual Basic as your sole programming language may make sense.

Delphi comes in three flavours — Developer, Professional and Client/Server. Unless finances are stretched, I would recommend the Professional version, which provides the source code for the VCL. This is an invaluable resource, for tracing through to find bugs and also to pick up coding tips. All the versions also come with a free copy of Delphi 1, which means you can continue to develop 16-bit software, if required.

If you're put off by the thought of Pascal,

there is always C++ Builder, which is almost exactly the same as Delphi but uses C++ as its language. In terms of what PC you'll need to run Delphi, I wouldn't recommend trying it on anything less than a Pentium-class CPU and at least 16Mb of RAM.

Chris Bell

PCW Details

Price Learn To Program version £49.95 (£42.51 ex VAT); Standard version £89 (£75.74 ex VAT); Professional version £468.82 (£399 ex VAT); Client/Server version £1,526.32 (£1,299 ex VAT)

Contact Borland 0800 454065
www.borland.com.uk

System Requirements Windows 95, Windows NT 3.51 or higher.

Good Points Object-orientated programming. The fastest compiler I've seen.

Bad Points Help files are poor.

Conclusion Still the best visual programming tool on the market. Possibly consider using VB if you're going to be writing code in Office applications as well.

★★★★★

We welcome readers' contributions to Long Term Tests and pay for those we publish. If you've used a piece of hardware or software for some time, write a 300-word piece for hardware or 650 words for software (plus GIF-format screenshot for the latter) and send it on disk in MS Word or ASCII format, to Lynley Oram at the usual PCW address, marking your envelope "Long Term Tests". Or email it to lynley_oram@vnu.co.uk.



In high spirits

Everything from PCs and inkjets to games and CDs are tested in the PCW sleigh this year. Plus, the dream team give their wishlists.

There's no mistaking this time of year: nights draw in, snow begins to fall, festive TV specials are compiled and the streets are packed with frantic shoppers. But why get pushed around the stores when you can choose and buy everything you want from the comfort of your warm armchair? We thought that sounded sensible, so we compiled this festive feature packed with everything you want for Christmas.



First up is our regular PC group test, testing computers designed for the home. We asked five retailers and five direct suppliers to send us a machine with all the jingle bells and whistles they could muster for less than £1,699 (ex VAT).

We just couldn't wait another six months to look at colour inkjet printers again, so here we've rounded up nine top models. Some are familiar faces from previous reviews, others are brand new. It's a competitive fight for the colour crown but we've found a winner. Rudolph's red nose has never been so bright.

The winter months are a perfect time to snuggle up with a cosy game. Our regular Screenplay section has been fattened for the season and seconded into our Christmas special. With no less than eight games, including first looks at Tomb Raider II, International Rally Championship and Fin Fin, we've got something for everyone. And to make sure you stand the best chance of beating the bad guys or winning the race, we've gathered together a handsome selection of joysticks, gamepads and wheels that make perfect stocking fillers.

We've also rounded up the best encyclopedias and reference CDs of the year, along with the kids stuff that may appeal equally to adults.

And if you're lacking inspiration, check out our personal recommendations. Yes, five members of the PCW team can't wait to tell you what they want for Christmas, so let's hope Santa's taking note.

Packed with seasonal spirit and without a humbug in sight, this is your one-stop Christmas superstore.

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Contributors

Home PCs Lynley Oram and Paul Trueman. **Colour inkjets** Nik Rawlinson. **General features** Gordon Laing, Dylan Armbrust, Adam Evans, Adele Dyer, Clive Akass, Etelka Clark, Paul Begg, Debbie Davies

Ratings

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

Atlantic Proteus Office (DIRECT)

Proteus Office isn't a promising name for a home PC. However, Atlantic has spruced up this machine with a few goodies to appeal to most home buyers, such as a 266MHz Pentium II processor and 32Mb SDRAM. Atlantic scored major brownie points for using the excellent AWE64 Gold sound card which, in our opinion, no home PC should be without. Oddly, the AGP slot has been left empty, with a PCI 3D graphics card used instead.

Setting up was fairly straightforward, although the Proteus had a few problems. First we were confronted with a stubbornly blank monitor. Quickly opening the case revealed a graphics card that, while screwed in, wasn't properly seated in its slot so no connection was being made.

Annoyingly, the mouse that shipped with the system didn't work properly, and after some time spent fighting to move the cursor about the screen, we switched to another one.

Our troubles didn't end there. The 6.5Gb Quantum Fireball hard drive, which had been making noises similar to heavy



industrial equipment, failed before we were able to run the Quake test. Luckily, before it packed in, we managed to run the monitor test, check out the modem and put the system through the BapCo benchmark.

Should this happen to a client, Atlantic assured us that an engineer would be despatched as soon as possible. Good news for home users is that Atlantic will make appointments for evenings and weekends, but the technical support line is still only open 9-5, Mon-Fri.

The software package is excellent, with something for everyone, such as Desktop Lawyer and World Book Multimedia. The IBM Simply Speaking package is great for those who can't type/won't type, and a headset with microphone has been included.

Monitor ADI 15in Provista E40, with 13.5in viewable and an EPA Energy Star rating. As the monitor holds the German TUV standard, it is also MPR II compliant. It suffers from more moiré than we would like, but images are crisp and colours vibrant, and the screen regulation is excellent.

PCW Details

Price £1,976.33 (£1,699 ex VAT)

Contact Atlantic 0990 134725

www.atlanticsystem.com/sys/

Good Points Sound card. Software.

Bad Points Hard drive failure. Unseated graphics card. Mouse.

Conclusion This machine should never have left the factory.

Build Quality ★

Performance ★★★

Value for Money ★★★

Overall Rating ★★

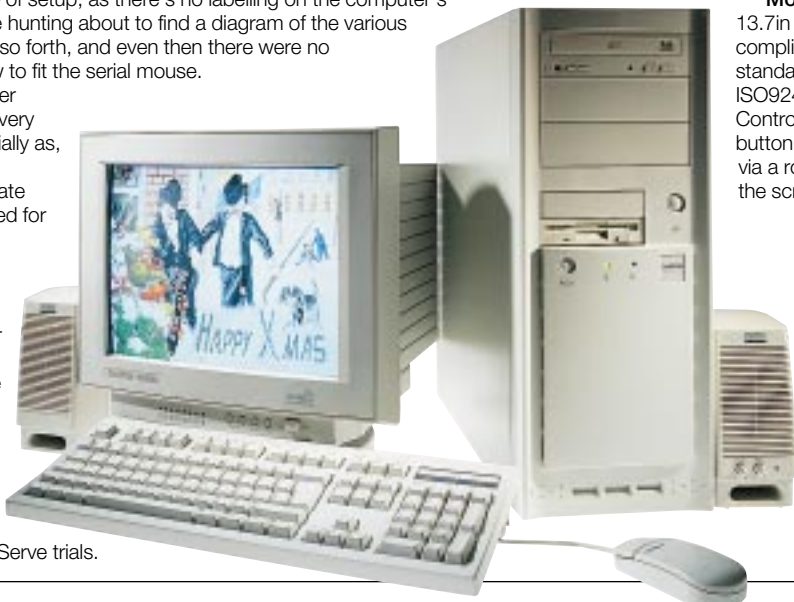
Brother Professor PII (RETAIL)

Brother sells via a slightly different retail channel than the other retail manufacturers in this group test. Its PCs are available in electricity showrooms and independent stores throughout the UK, but you won't find the Professor PII in places like PC World or Dixons.

To catch a consumer's eye, and hopefully his or her wallet, manufacturers of retail computers normally spend a fair chunk of their budgets on developing stylish designs. Not so with this system, which comes in a tall, non-descript case.

Along with design, Brother could also do with investing some thought into ease of setup, as there's no labelling on the computer's rear. It took some hunting about to find a diagram of the various connections and so forth, and even then there were no directions on how to fit the serial mouse.

A first-time user could find all this very confusing, especially as, on startup, the Windows 95 update driver wizard asked for the installation of missing USB drivers. There is nothing in the way of support or help for connecting to the internet and getting online, except for the usual round-up of online services such as AOL and CompuServe trials.



On a bizarre note, the 24-speed CD-ROM had been allocated the drive letter Z, which isn't a problem in itself, but it does add to the overall feeling of confusion.

There's so much space under the lid of this system that even the Pentium II 233MHz CPU looks lost, and you won't have any problems installing full- or three-quarter-length cards. Brother has installed an ATI Xpert@Work card in one of the four PCI slots. This is a great card, but a curious choice as it leaves the AGP slot unused. Sound is on the motherboard, provided by an excellent Yamaha OPL3 chipset.

Technical support is offered during office hours only.

Monitor A 15in Brother BM86, with 13.7in viewable, and EPA Energy Star compliant. It also carries the international standard for monitor ergonomics, ISO9241:3. Focus could have been crisper. Controls, including a manual degauss button, are not on-screen but are accessed via a row of buttons across the bottom of the screen.

PCW Details

Price £1,750 (£1,489 ex VAT)

Contact Brother 01279 416888

www.kyodai.brother.co.uk

Good Points Price. Build quality.

Bad Points Lacks ease of setup.

Conclusion A great machine, but not really suitable for an inexperienced user.

Build Quality ★★★★★

Performance ★★★

Value for Money ★★★

Overall Rating ★★★

Compaq Presario 4526 (RETAIL)

Retail PCs traditionally come better equipped in terms of software and manuals than their off-the-page (OTP) rivals. The Compaq Presario is an exception, with only the basics offered in terms of manuals, and an unimaginative software bundle. Titles like Encarta 97 and Creative Writer 2 do not a wild time make, and were not installed on the PC.

A fairly skinny selection of software had been pre-installed. There's the usual Windows pack, an online version of SimCity2000, some MS Office and Money applications. If you buy the Presario 4526 before 31 December this year, you will receive an additional complimentary software bundle worth £1,000. Users will have to use MSN to connect them up to the internet, as there are no introductory CDs or other pre-installed online services to help you out.

That said, this was one of the easiest PCs to set up, with colour co-ordinated leads and sockets. The tower case is impressively compact and moulded into an attractive retro-rocket look.

Praise should go to the designers of the Compaq tower, who have packed every square inch of space with the necessary components. It looks well thought out, but



unfortunately, upgrading your Presario is out of the question. This machine was not designed for users to open up and fiddle about in, installing their own kit. In fact, it's hard to find the different components in there, let alone replace them, or install more.

Compaq includes most of its Presario range of hardware in the package, and it suffers in this respect. It means that the PC is fitted with a Presario 56K modem, but the mouse is of a poor standard.

The Presario CD-ROM is an odd, trayless one. Having to push CDs into the fur-lined drive rather than place them on a tray, means that if you forget you already have a CD in the drive, you risk damaging them.

Monitor Compaq 1525 15in, with 13.5in viewable. It has a good volume knob that doubles as an on/off switch. Picture quality is poor and badly focused. Bizarrely, the picture is worse in the middle of the screen than on the edges, resulting in badly blurred text that is guaranteed to give anyone a headache.

PCW Details

Price £1,799 (£1,531 ex VAT)

Contact Compaq 0845 2704000

www.compaq.co.uk

Good Points 56K modem. Attractive casing.

Bad Points Poor-quality picture. Limited upgradeability.

Conclusion Good software offer. Easy setup.

Build Quality ★★

Performance ★★

Value for Money ★★

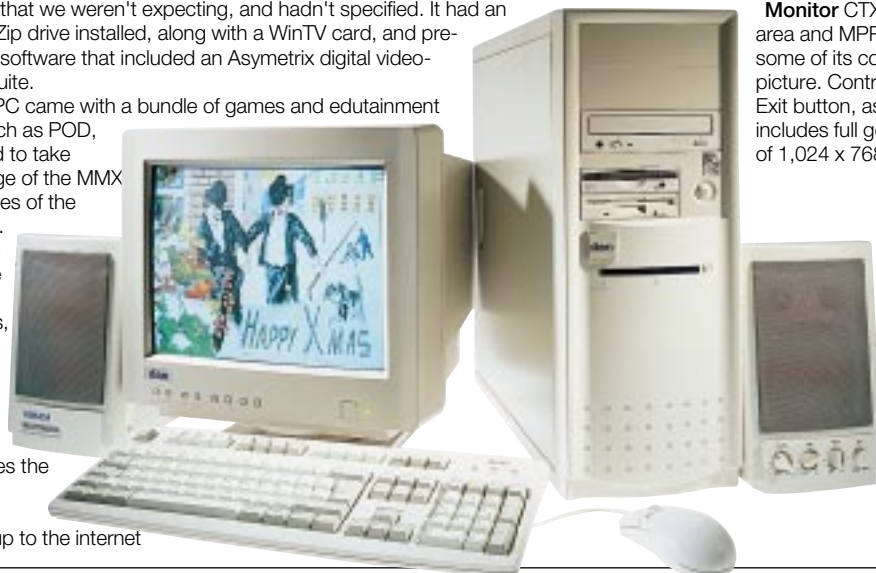
Overall Rating ★★

Dan Dantum II (DIRECT)

The Dantum II from Dan is typical of the off-the-page PC: bland in appearance and designed with no flair or feel for aesthetics. However, it purrs along like a turbo-charged Rolls Royce, and when a PC performs with so much power and speed, who would care if it looked like a breeze block?

Like some of the OTP computers we saw, this had a powerful Pentium II 266MHz CPU. Dan has fitted this model with some particularly impressive components, considering the price. There's an ATI Xpert@Work AGP card, a 56K PACE modem, and a Creative Labs AWE64 sound card to go with the bass-heavy 160W Yamaha HA-107 speakers. The Dantum II scored extra points for including bonus goodies that we weren't expecting, and hadn't specified. It had an Iomega Zip drive installed, along with a WinTV card, and pre-installed software that included an Asymetrix digital video-editing suite.

The PC came with a bundle of games and edutainment titles, such as POD, designed to take advantage of the MMX capabilities of the machine. A round-up of the usual suspects, like Encarta and Creative Writer, completes the software bundle. Linking up to the internet



was simplicity itself, as there was a custom-made CD included that did all the necessary hard work. It took just a few minutes to connect, using Pipex as the online service. The option to go online with either the pre-installed CompuServe trials.

The interior was the epitome of order and planning, with all offending leads taped up and out of harm's way. There were two free DIMM slots, so a user could triple the 32Mb of SDRAM already installed at a future date. There's room for another two PCI cards, and two internal free 5.25in bays to go with the single free external 3.5in.

Monitor CTX 1569 15in with a 13.8in viewable area and MPR II compliant. Not as generous as some of its competitors, but it did give a good picture. Controls are on-screen, with a separate Exit button, as well as an options menu that includes full geometry controls. It ran a resolution of 1,024 x 768 at a refresh rate of 75Hz.

Personal Computer World
EDITOR'S

PCW Details

Price £1,991 (£1,694 ex VAT)

Contact Dan 0181 830 1100

www.dan.co.uk

Good Points Very impressive hardware. Easy internet access.

Bad Points Monitor could have been bigger.

Conclusion What a piece of work is a Dan?

Build Quality ★★★★★

Performance ★★★★★

Value for Money ★★★★★

Overall Rating ★★★★★

HP Pavillion 8110 (RETAIL)

Personal
Computer
World
**Highly
Commended**

Hewlett-Packard has come up with the ultimate in handholding computing with its latest Pavillion 8110. All the connections are colour coded, and there's even a beautiful, colour laminated wallchart to guide you through the process. Starting up the PC also launches a software package that takes you step-by-step through using your new computer, even down to getting you hooked up to the internet.

The user's manual is so easy to use and comprehensive, it even includes the PC equivalents of how to boil an egg, like what to do when you get a non-system disk error. The system configuration includes an Intel Pentium 200MHz MMX processor, a 2.5Gb hard drive and 32Mb RAM. Even after hours of use, the huge fan and vent located over the CPU kept everything cool to the touch.

HP misses the mark by a mile in the fashion stakes, having taken as read that grey is the new black. However, it has put a lot of effort into designing this PC, and while the mini tower is huge, it is the sort of machine you could leave in the living room to wow your mates with.

For a retail machine, the price tag of £1,452.30 (inc VAT) is reasonable. The keyboard is colour co-ordinated to go with the monitor. Controls for the CD-ROM, such

as play, rewind, volume, and the ever-important mute, are located on the keyboard, which is colour co-ordinated to go with the monitor. There are also buttons for accessing various functions such as the internet and your favourite software programs. As the Pavillion is aimed at the novice user, HP has already installed a cut-down SCSI card, so devices like scanners can be plugged in without opening the PC. It is little touches like this that make this PC stand out from the retail crowd.

Monitor HP Pavillion Multimedia 15in, with 13.8in viewable area. It is both EPA Energy Star and MPR II rated. Controls are on-screen, with the usual adjustments complemented by colour temperature controls. It's capable of handling a non-interlaced resolution of 800 x 600 at 85Hz refresh rate. The picture is crisply focused, with good, vibrant colours.



PCW Details

Price £1,452.30 (£1,236 ex VAT)

Contact HP 0121 766 5559

www.hp-cpo.com

Good Points Ease of use. Price.

Tech support.

Bad Points A little slow.

Conclusion Ideal for the budget-conscious, with nice extras.

Build Quality ★★★★★

Performance ★★

Value for Money ★★★★★

Overall Rating ★★★★★

Hi-Grade Axion PR11 266 (DIRECT)

Personal
Computer
World
**Highly
Commended**

This may not be the most attractive case we've ever seen, but the Axion PR11 266 has personality. Housed in a large case and accompanied by the latest ADI monitor, the Axion PR11 266 hulked on the bench in the VNU Labs like a prize fighter, throwing threatening looks at the other PCs. Inside, it certainly had the muscle to back up the threats, with a Pentium II 266MHz CPU backed up by 32Mb of SDRAM housed in one of three DIMM slots.

We were most impressed by the use of an LS-120 instead of a 1.44Mb floppy drive. This piece of kit does the job of two devices: it will run your old 1.44Mb floppies, but it also takes proprietary disks which can store just under one hundred times as much data. Mind you, the LS-120 isn't as fast as the ZIP drive, so you'll need a little patience when backing up those big files. It makes an excellent storage device.

Hi-Grade has made the most of the capabilities of

the Intel
440LX
chipset
by

installing an AGP graphics card, the ASUS V3000. This card uses the NVidia graphics processor, a chip which has proved exceptionally fast in tests. In the VNU Labs, it managed to help the pull the Axion way ahead of the competition in the Quake test. Getting online is a piece of cake, using the Hi-Net CD-ROM which accompanies the system. Just plunk the CD into the 24-speed Teac CD-524E and follow the on-screen instructions. Piece of cake.

There's a range of family-orientated software packages which should keep the entire family occupied on Christmas Day, including Lotus SmartSuite 97 and games like Network Q and RAC Rally Championship. The copy of IBM Simply Speaking Gold is a nice touch, as is the headset with microphone included in the box.

Monitor ADI Microscan 5P 17in, with 15.6in viewable, plus EPA Energy Star and MPR II compliance. It has an optional USB port and the usual range of on-screen controls, including manual degaussing. Colours are vibrant, the picture is crisp and sharply focused. A



PCW Details

Price £1,996 (£1,699 ex VAT)

Contact Hi-Grade 0181 532 6111

www.higrade.com

Good Points LS-120 drive. AGP graphics card.

Bad Points No technical support weekends/evenings.

Conclusion Loads of features for the price. A great gaming PC.

Build Quality ★★★★★

Performance ★★★★★

Value for Money ★★★★★

Overall Rating ★★★★★

Packard Bell Pulsar 20 (RETAIL)

If you like neo art deco kitsch, you'll love the Packard Bell Pulsar 20. It's a welcome colour change to beige, with the orange/green case resembling the curved front of The Flying Scotsman. The back of the tower case is as brightly decorated as the front, with coloured leads and corresponding sockets.

This PC seems truly aimed at the family market. Packard Bell has pre-installed its own desktop navigator, a rather twee virtual house integrated with all the software in the system. Want to learn something? Click on The Study, and you've got access to all the reference titles that are included in the computer's software bundle. If you're looking for a PC package that will hold your hand down that mysterious information superhighway, then the Pulsar is for you.

Whereas some retail machines are designed never to be opened up, this model had lots of space inside, with an accessible motherboard and three free PCI slots. The NEC 24-speed CD-ROM and floppy drive are nearly impossible to get to. There is room for expansion though, with internal bays — one free 3.5in and two free 5.5in. The Pulsar 20 scored points for



packing a 33.6K US Robotics modem. It also has an on-board graphics processor, ATI's 3D Rage II.

While this computer has some impressive components, it is let down by having only 16Mb RAM and 256Kb pipeline burst cache memory. A bit skimpy for a Pentium 200MHz MMX, considering that most other retail machines managed to get in 32Mb RAM.

The Pulsar comes with a more imaginative bundle of CD-ROM software than some of the other retail PCs we saw. It ranges from out-and-out fun titles like MDK and Fifa97, to the more esoteric Musée d'Orsay Impressionism CD.

Monitor The 15in 5480, with 13.8in viewable, loses focus towards the centre of the screen.

Controls aren't on-screen but they are easy to use, and there's a self-test feature for the cautious. It's capable of a resolution of 1,024 x 768, with a refresh rate of 85Hz. This isn't worth trying though, as text is too fuzzy to read.

PCW Details

Price £1,499 (£1,276 inc VAT)
Contact Packard Bell 01628 508200
www.packardbell/europe.com
Good Points Imaginative design. In-depth manuals. Easy internet access.
Bad Points Unpleasant screen. Tinny Speakers. Nasty buttons on tower case.
Conclusion Will suit the family keen to discover what all the home PC fuss is about.
Build Quality ★★★★★
Performance ★★★
Value for Money ★★★
Overall Rating ★★★

Roldec Predator (DIRECT)

The Predator sports a 300MHz Pentium II CPU, but for all the potential speed and power that implies, this PC got off to an ignominious start. When we switched the PC on for the first time, we were greeted by the horrifying phrase, "No operating system found". For the novice or first-time PC user, this could be a daunting hurdle. But we typed in the command c:\win and that seemed to do the trick, as we didn't see the message again during any subsequent startups.

The Predator was one of the most impressively appointed PCs we looked at, with a 17in Princeton monitor, a 4.3Gb Quantum Fireball hard drive, a US Robotics 33.6K modem and an AGP Xpert@Work graphics card. Sound is via an on-board Yamaha OPL3 chipset. The Labtec LCS800 speakers were a severe disappointment, considering the high standard of components and peripherals that Roldec has assembled here.

With such a weedy sound, serious gamers, and users who like listening to audio CDs while they work, may want to make their own selection.



There's plenty of room for upgrading, with three free PCI and two vacant ISA slots inside a tidy, ordered tower case. As for the outside, well, let's just say that the "Intel Pentium II Inside" sticker was the most attractive thing about the whole package.

The trade-off for such a stonkingly fast CPU is the lack of bundled software. It doesn't come with any pre-installed applications other than the operating system, although there were two CD-ROMs that weren't hardware drivers: an AOL, and a Virgin Net package. We tried Virgin's offer, out of curiosity. After getting online in a few minutes, we're happy to report that Mr Branson has come up trumps again with a quick, simple registration process.

Monitor A 17in Princeton EC107, with 15.5in viewable and MPRII compliancy. We were impressed by the sharpness of the picture, and the onscreen controls which keep track of the current refresh rates. It's capable of a non-interlaced resolution of 1,152 x 864 with a refresh rate of 75Hz, although the picture is firmer at lower resolutions.

PCW Details

Price £1,996 (£1,699 ex VAT)
Contact Roldec 01902 456464
www.roldec.com
Good Points CPU. Needle-sharp monitor display.
Bad Points Very little extra software. Unimpressive speakers.
Conclusion Serious gamers and power users should look no further.
Build Quality ★★★★★
Performance ★★★★★
Value for Money ★★★★★
Overall Rating ★★★★★

Tiny Sound and Vision (RETAIL)

Tiny differs from the other retail outfits in this group test in that its PCs are sold in its own shops, of which there are currently 46 dotted about the UK. The company sells specific models which customers can try out in-store, but each PC is made up to spec when ordered. Consequently, we expected Tiny to be able to provide fresher components than the other retail companies. While this machine wasn't as highly specified as the systems provided by the direct companies, it did manage to include some impressive components for the price point.

Hidden under the bland exterior lurked a Pentium II 233MHz processor, 32Mb of SDRAM occupying one of three DIMM slots, and an ATI Xpert@Work graphics card fitted into the AGP slot. Unlike the home version, the Xpert@Play, this card doesn't have a video-out connector. There is a TV tuner card however, located in one of the two ISA slots, which has an S-Video connector. The other ISA slot is occupied by a 33.6K modem, with sound provided by an onboard Yamaha OPL3 chipset.

Some attention has been paid



to making setup reasonably easy: not a lot, but some. A photocopied A3 sheet provided detailed diagrams of both the front and rear of the system, as well as all the connections. Any first-time user should be able to follow this with ease.

The software package is comprehensive, with a good mix of educational software such as gardening and cooking, plus there's Reader Rabbit for the youngsters. There's a couple of utilities, LanDesk and Rescue Me. A LineOne icon on the desktop provides instant access to registering an online account. There's also a rather nice online technical support guide installed on the desktop, to help you out in tricky situations.

Monitor A 17in unbranded monitor, with 15.5in viewable and both MPR II and EPA Energy Star ratings. Controls are on-screen and include all the usual sizing, positioning and geometric controls, with an additional degauss feature. The picture is reasonably sharp, but this wasn't the best of the 17in monitors we saw.

PCW Details

Price £1,996 (£1,699 ex VAT)
Contact Tiny 0800 821333
www.tinycomp.co.uk
Good Points Large monitor. Graphics card. TV tuner.
Bad Points Setup could be easier.
Conclusion Great value for a retail machine, but the off-the-page people do it better and cheaper.
Build Quality ★★★
Performance ★★★
Value for Money ★★★
Overall Rating ★★★

Watford Electronics Aries Pro Media TX-97 (DIRECT)

Watford Electronics was the only one of the off-the-page companies to supply a machine without a Pentium II. Instead, the Aries Pro Media TX-97 sports a Pentium 233MMX CPU. In mitigation, this was one of the least expensive PCs, costing only a tenner more than the Packard Bell, and it far outdoes some of the retail machines in terms of components.

The Quantum Fireball Stratus hard drive has an enormous 6.4Gb of storage space. Sound is provided by the excellent AWE64 sound card from Creative Labs. A 56K modem is also installed, leaving one free ISA slot. Graphics is provided by a Matrox 2Mb Mystique 220. Memory expansion is limited, as both DIMM slots are occupied by 64Mb of SDRAM. However, there's plenty of room for fitting more drives, with one external 3.5in and two external 5.25in forward-facing bays vacant.

A curious rattling noise coming from inside the case turned out to be a loose screw rattling about. Otherwise, the innards were exceptionally tidy, with neatly tied and bundled cables.



We liked the lengthy standard warranty of one year on-site and five years return-to-base, upgradeable to three years on-site. This is an important consideration when looking for a home PC, as it's likely that the machine will be expected to have a longer lifespan than a business computer. Watford also gets a gold star for offering weekend technical support: 10-4 on Saturdays. You're still restricted to office hours during the week though, which isn't helpful when you're at work and your PC is at home.

The software package includes Corel WordPerfect 7, LanDesk, and a range of Compton's Home Library titles, which should keep most of the family amused. No games, though. Neither is there anything special for internet connection, with just the basic online services offered.

Monitor GX 1569 15in, with 13.6in viewable, and both EPA Energy Star and MPR II ratings. Controls are on-screen and include all the usual size, positioning and geometric adjustments, plus a manual degauss and a status button. Focus could have been crisper, but it's not hard on the eyes.

PCW Details

Price £1,509.88 (£1,285 ex VAT)
Contact Watford Electronics 01582 745555
www.watford.co.uk
Good Points Price. Warranty. Memory. Hard drive.
Bad Points Could have included some games.
Conclusion A good PC for the price-conscious.
Build Quality ★★★
Performance ★★★
Value for Money ★★★
Overall Rating ★★★

Editor's Choice

Christmas is almost upon us. Mums and dads the length and breadth of the country are pondering that age-old question: Should this be the year we get a computer for the family? Well, there are a few incentives to make you take the plunge now. Intel has recently dropped the prices on its Pentium II processors. And, not only does the new AGP graphics bus look set to revolutionise the way we play games, but AGP cards are no more expensive than PCI versions. By and large, warranties are still poor, with one year on-site being about the norm. Roldec stands out here, offering a five years return-to-base (RTB) policy. The retail companies come out on top for technical support. Out of the direct companies, only Watford offered support outside office hours. Seven machines sported an ATI 3D graphics card, with the Xpert@Work proving most popular.

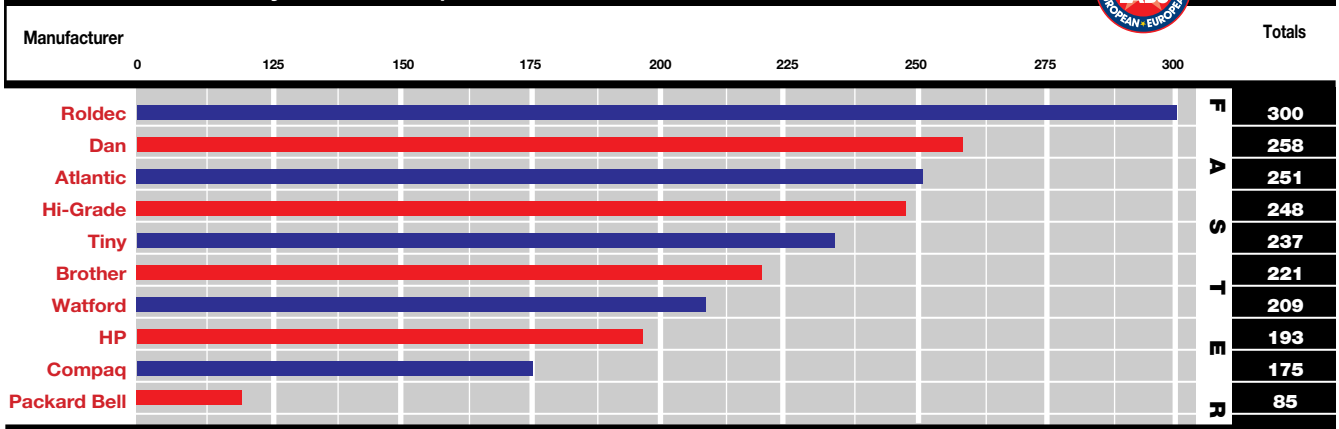
Should you buy your PC from a shop, or off the page? One glance at the features table (p142) reveals that you definitely get better value for money buying from one of the direct companies. With the exception of Watford Electronics, you can generally expect to get a Pentium II processor, an AGP 3D graphics card, 32Mb SDRAM, more than 3Gb of storage on the hard drive, and even a backup device such as a ZIP drive. Roldec again deserves a mention here, because the Predator is more suited to experienced users and gamers rather than for the home. The retail companies

paled in comparison, still using Pentium MMX processors, and both Packard Bell provided only 16Mb SDRAM.

With this in mind, we decided to judge the retail PCs on style, ease of setup, ease of use and value for money. Could mum and dad set up this PC on Christmas Day without any difficulties? For all these reasons, we gave a **Highly Commended** to **Hewlett-Packard** for its Pavilion 8110, and also to **Hi-Grade** which, in its Axion PR11266, provided a top-rate home PC, choc-full of goodies and with an impressive 17in monitor. With a similar spec, but slightly more orientated towards the home and family, the **Dan Dantum II** receives our **Editor's Choice** award.



Sysmark/Bapco scores



Quake scores

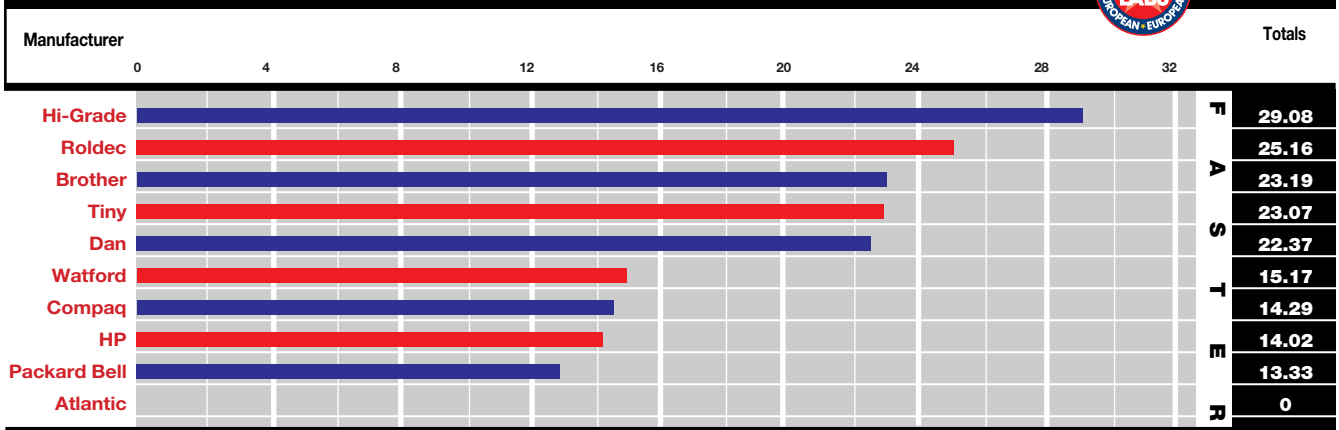













Table of Features					
					
Manufacturer	Atlantic Systems	Brother	Compaq	Dan Technology	Hewlett-Packard
Model Name	Proteus Office	Brother Professor II	Presario 4526	Dantium II/266SW	HP Pavillion 8110
Price (ex VAT)	£1,699	£1,489	£1,531	£1,694	£1,236
Price (inc VAT)	£1,976.33 inc delivery	£1,750	£1,799	£1,991	£1,452
Telephone	0990 134725	01279 416 888	0845 2704000	0181 830 1100	local retailer
Web address	www.atlanticsytem.com/sys/	www.kyodai.brother.co.uk	www.compaq.co.uk	www.dan.co.uk	www.hp-cpo.com
Standard warranty	1yr onsite/4yrs RTB	1yr onsite	1yr onsite	1yr onsite	1yr onsite
Warranty options	3yrs onsite/2yrs RTB	3yrs on-site	See retail outlet	3yrs on-site	3 yrs
Technical support	9-5 Mon-Fri	9-6 Mon-Fri	8-8 Mon-Fri	9.30-6 Mon-Fri	9-9Mon-Fri 9-3 Sat
Hardware Spec					
Processor	PII 266 MHz	PII 233MHz	P233MHz MMX	PII 266 MHz	P200MHz MMX
RAM/Type	32Mb SDRAM	32Mb SDRAM	16Mb SDRAM	32Mb SDRAM	32Mb/EDO/SIMMs
Hard disk	Quantum Fireball	Seagate	Compaq	Seagate	Western Digital
Size(Gb)/Interface	6.5Gb EIDE UDMA	3Gb EIDE	4Gb EIDE	6.4Gb EIDE UDMA	2.5Gb EIDE
Motherboard Components					
Motherboard manufacturer	Intel	Intel	Compaq	Asustek	ASUS
Chipset	Intel 440LX	Intel 440LX	Intel 430VX	Intel 440LX	Intel 430TX
L2 cache/max cache (Kb)	512	512	256	512	256
Expansion and I/O					
Spare bays 3.5/5.25	2x 3.5in/2x 5.25in	2x 3.5in/2x 5.25in	None	1x3.5in/2x5.25in	1x3.5in/2x5.25in
AGP	●	●	○	●	○
PCI slots/ISA slots/shared slots	4 PCI/2ISA/1shared	4PCI/2 ISA	1PCI/1ISAshared	3PCI/2ISA/1shared	5 ISA/2 PCI
USB/serial/parallel/PS2	2 USB/2S/1P/2PS/2	2USB/2S/1P/2PS/2	2USB/2S/1P/2PS/2	2USB/2S/1P/2PS/2	2USB/1S/1P/2PS/2
Multimedia					
CD-ROM manufacturer	Goldstar	Toshiba	Compaq	Panasonic	Goldstar
CD-ROM speed/interface	24x EIDE	24x EIDE	24x EIDE	24x EIDE	24x EIDE
Sound card manufacturer	Creative Labs	Yamaha	ESS	Creative Labs	Polk Audio
Sound card model	AWE64 Gold	OPL3	ESS	Awe 64	Roland MPU-401
Speakers	SP868 80w	Screen Beat	JBL PRO	Dan Hi-Fi	Polk Audio Clip-on
Graphics & Monitor					
Graphics card	ATI Xpert@work	ATI Xpert@Work	S3 Trio KV2	ATI Xpert@Work	ATI 3D Rage II
RAM/Type	4Mb SGRAM	4Mb SGRAM	1Mb	4Mb SGRAM	2Mb VRAM
Monitor model	ADI 4P	Brother BM86	Compaq 1525	CTX 1569	HP Pavillion
Monitor size	15in	15in	15in	15in	15in
Max refresh rate @ 1,024x768(N)	75Hz	75Hz	75Hz	85Hz	75Hz
Other Information					
Modem speed (Kbps)	56	33.6	33.6	56	K56Flex DVSD
Internet ready (Yes/No)	●	●	●	●	●
Other extras				Zip drive/TV card	
Office suite	Office 97	MS Works	MS Money & Works	Works 4.0	MS Works
Other software	Ultimate Human body IBM Simply speaking CorelDraw 4	Encarta, Football AutoRoute Express Magic Schoolbus	£1,000 additional software, until 31/12/97	Quicken 6 PagePlus LanDesk, Encarta	EasyPhoto Infopedia, Fifa 97 SimCity 2000
Annual company turnover	£26 million	\$1.3 billion worldwide	\$18 billion (worldwide)	47	£1.9 billion (UK)
Number of employees	160	5,000 worldwide	n/a	180	5,400 (UK)

Key Yes ● No ○

Table of Features										
										
Manufacturer	Hi-Grade	Packard Bell	Roldec	Tiny	Watford Electronics					
Model Name	Axion PII-266	Pulsar 20	Predator	Sound & Vision	Aries pro Media TX-97					
Price (ex VAT)	£1,699	£1,276	£1,699	£1,699	£1,285					
Price (inc VAT)	£1,996	£1,499	£1,996	£1,996	£1,510					
Telephone	0181 532 6111	01628 508200	01902 456464	0800 821333	01582 745555					
Web address	www.higrade.com	www.packardbell/ europe.com	www.roldec.com	www.tinycomp.co.uk	www.watford.co.uk					
Standard warranty	1yr onsite inc P&L	1 yr onsite	1yr P&L/5yrsRTB	1yr P&L, RTB	1yr onsite, 5yrs RTB					
Warranty options	3yrs onsite	See retail outlet	4yrs Lab/3yr onsite	up to 3 yrs onsite	3yrs on-site					
Technical support	9-5 Mon-Fri	(Mastercare) 24hrs/7days/wk	9-5.30 Mon-Fri	9-5.30 Mon-Fri/10-4 Sat	10-6 Mon-Fri, 10-4 Sat					
Hardware Spec										
Processor	PII 266 MHz	P200MHz MMX	PII 300MHz	PII 233MHz	P233MHz MMX					
RAM/Type	32Mb SDRAM	16Mb SDRAM	32Mb SDRAM	32Mb SDRAM	64Mb SDRAM					
Hard disk	Maxtor Diamondmax	Seagate or Western Digital	Quantum Fireball	Fujitsu	Quantum Fireball ST					
Size(Gb)/Interface	5.2Gb EIDE UDMA	3.2Gb EIDE	4.3Gb EIDE UDMA	4.3Gb	6.4Gb					
Motherboard Components										
Motherboard manufacturer	ASUS	Packard Bell	Intel	Intel	Aries TX97					
Chipset	Intel 440 LX	Intel 440TX	Intel 440LX	Intel 440LX	Intel 430TX					
L2 cache/max cache (Kb)	512	256	512	512	512					
Expansion and I/O										
Spare bays 3.5/5.25	1x3.5in/2x5.25in	1x3.5/2x5.25in	2x3.5in	1x3.5in/2x5.25in	1x 3.5in/2x 5.25in					
AGP	●	○	●	●	○					
PCI slots/ISA slots/shared slots	5 PCI/2 ISA/1 Shared	3PCI/1ISA	3PCI/1ISA/1shared	4PCI/2ISA	4 PCI/4 ISA/1 shared					
USB/serial/parallel/PS2	2USB/2S/1P/2PS/2	2USB/1S/1P/2PS/2	2USB/2S/1P/2PS/2	2USB/2S/1P/2PS/2	2USB/2S/1P/1PS/2					
Multimedia										
CD-ROM manufacturer	TEAC	NEC	Teac CD-574E	Matshita CR-585	Panasonic					
CD-ROM speed/interface	24x EIDE	24x EIDE	24x EIDE	24x EIDE	24x EIDE					
Sound card manufacturer	Creative Labs	P-Bell Aztec 2320	Yamaha	Yamaha	Creative Labs					
Sound card model	AWE64	Sound 16C	OPL3	OPL3	AWE64					
Speakers	Yamaha YST-M15	Packard Bell	Labtec LCS800	Juster Multimedia	Aries 80w					
Graphics & Monitor										
Graphics card	ASUS AGP V3000	ATI Rage II	ATI Xpert@Work	ATI Xpert@Work	Matrox Mystique 220					
RAM/Type	4Mb SGRAM	2Mb VRAM	4Mb SGRAM	4Mb SGRAM	2Mb SGRAM					
Monitor model	ADI Microscan 5P	PB 5480	Princeton EO17	29J76C	GX 1569					
Monitor size	17in	15in	17in	17in	15in					
Max refresh rate @ 1,024x768(NI)	85Hz	85Hz	85Hz	75Hz	85Hz					
Other Information										
Modem speed (Kbps)	33.6	56	33.6	33.6	56K Flex					
Internet ready (Yes/No)	●	●	●	●	●					
Other extras	120Mb Superdisk	Fastmedia Keyboard								
Office suite	Lotus SmartSuite 97				Corel WordPerfect 7					
Other software	LanDesk IBM VoiceType Gold Principal 97 Pack	Selection of family and games software	PC Systems diagnostic check	LanDesk Virus Protect Rescue Me! Softkey Home Pack	LanDesk, Supervoice Comptons Home Library selection					
Annual company turnover	£17.5 million	n/a	12 million	£110 million	n/a					
Number of employees	85	n/a	56	500	110					

Key Yes ● No ○



Create colourful images this Christmas. Nik Rawlinson tests nine inkjets to see if they're worthy stocking fillers.

You can't help but love colour inkjet printers. Producing near photographic-quality prints at a fraction of the price of other colour printers, they've caught the hearts and minds of PC users worldwide.

Whether you're producing a winning presentation or creating your own calendar, a colour inkjet will probably end up being one of the most useful things you ever buy. And they've never been cheaper or better.

We got tired of waiting a whole year between group tests, so decided to take another look six months on. Half a year after our last inkjet group test, only a few models we originally tested remain current. We've taken these into the labs once again and compared them with the latest crop to see who'll take the throne. Over the next four pages, nine contenders vie for the colour crown.

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

Inkjets Contents	
147	Alps MD1000
147	Canon BJC-80
147	Canon BJC-250
148	Canon BJC-4300
148	Epson Stylus Color 300
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Alps MD 1000

Differing slightly from the other printers in the group, the smart, dark-grey MD-1000 (*PCW November 1997*) uses tapes rather than ink cartridges. Drawing the paper through up to four times, it prints the whole page in each colour in turn. The common CMYK options are supplemented by tapes for silver, gold, metallic cyan and magenta, and even white for printing on black media. On the downside, they make the printing process noisier than many inkjets. Instead of the usual three or four resolutions, the choice of settings changes depending upon the type of output selected. Normal printing can be done at either 300 or 600dpi. Quality was disappointing when using plain paper, which would mean drastically increased running costs for the home user (high-grade paper is £10.69 for 200 sheets). This machine really comes into its own when printing graphics. Taking six minutes and one second (6'01") at 600dpi, the gradated colours in the business graphics were smooth, with only slight stepping on the black fade. The inverse hairline was by far the clearest of any seen throughout the test. Printing the photo at 600dpi (9'26") on



high-grade paper produced slight banding in some areas, but using photographic paper at 1,200 x 600dpi and the finishing cartridge, produced some of the best reproduction of all the printers tested. Bundled with Print Artist and Hanes T-shirt maker, this printer is ideal for graphics, and the added options for printing with metallic or white ink make it a desirable purchase for those who cannot get these slightly unusual facilities elsewhere. That said, a conventional inkjet may be more suitable for those wishing to have a balance of printing both graphics and text.

Personal Computer World
Highly Commended

PCW Details

Price £299 (£254.47 ex VAT)
Contact Alps 0800 973405
www.alps.ie
Good Points Business graphics. Choice of ink colours.
Bad Points Noisy. Poor copy paper.
Conclusion Impressive, but a conventional inkjet may be more suited to the home user.
★★★

Canon BJC-80

Tiny, charcoal-coloured and quiet, we've fallen in love with this printer. Tiny printheads have drop-in refills (black or CMYK) and can be replaced by the world's smallest scanner, built into another cartridge. It's about half the size of a notebook and is suited to those on the move, with its optional battery with a life of 200 pages. There's also the choice of using a serial cable or the built-in infra-red communications port for easy data communications. Print speeds are adequate, with a standard-quality page from Word taking just 19 seconds to print. Quality was not too good with the mono printhead, giving speckly grey characters rather than black. Using the CMYK cartridge improved matters greatly, resulting in solid characters with smooth edges. White speckling was present in most graphical output, including high-quality photo reproduction on Canon's bubblejet paper with the Fine option activated. The business graphics from Corel demonstrated strong banding at standard quality. This was eliminated when switched to high quality, but in both instances the fading bars were visibly stepped. The optional scanner cartridge is TWAIN compliant and can be



used with its own software or many popular graphics packages. But it's much slower than the scanning adapter for the Canon BJC-4300, taking 11'12" to scan an A4 colour page at 180dpi. Although the scanning cartridge and printer can be purchased separately, buying them together will save you £30. There is a lot to be said for this feature-packed printer, which drew gasps of admiration when it arrived in the PCW office and didn't fail to impress.

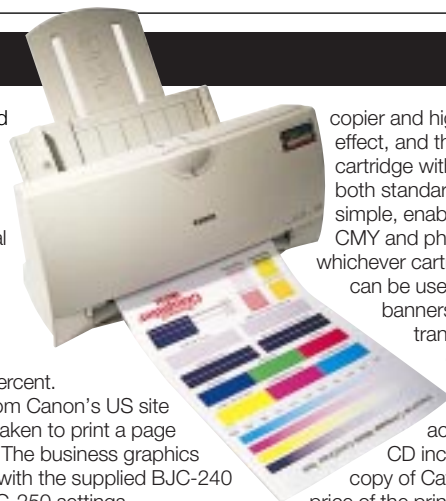
Personal Computer World
Editors Choice

PCW Details

Price £233.83 (£199 ex vat); scanner cartridge £104.57 (£89 ex vat); printer and scanner together £304.33 (£259 ex vat)
Contact Canon 0121 680 8062
www.canon.co.uk
Good Points Overall performance.
Bad Points Bad points? What bad points?
Conclusion An excellent all-rounder.
★★★★★

Canon BJC-250

Small, elegant and attractive — and the price of this printer can be redeemed against the cost of a Thomas Cook holiday [see *Competition*, page 337]. The driver disk did not include the necessary files, but the manual ensured us that the BJC-240 driver was compatible. This threw up non-fatal error messages about colour adjustment methods not being available each time we printed, darkened and dulled the colours in the photo printout, and increased the print time by 40 percent. After downloading the BJC-250 driver from Canon's US site (not available through the UK site), the time taken to print a page from Word reduced from 45 to 36 seconds. The business graphics from Corel, which took 8'02" at high quality with the supplied BJC-240 driver, took only 7'34" minutes using the BJC-250 settings. The small text on the Excel spreadsheet was clear and easy to read, and the inverse hairline in the CorelDraw business graphics was well defined. Draft-quality text output was fairly fast but very light and speckly. Standard and high-quality output was feathered on both



copier and high-resolution paper. Cleaning the head had no effect, and the only solution was to replace the half-used cartridge with a new one. Output was then much improved in both standard and high resolutions. Changing cartridges was simple, enabling us to choose from black, CMY, fluorescent CMY and photo cartridges. Containers were supplied to hold whichever cartridge was not in use. A wide range of print media can be used, including banners, T-shirt transfers and even fabric sheets. The accompanying CD included a copy of Catz (worth the price of the printer in itself!) and PrintMaster Suite for producing cards, banners and posters from scratch or based on pre-drawn templates.

PCW Details

Price £163.33 (£139 ex vat)
Contact Canon 0121 680 8062
www.canon.co.uk
Good Points Bundled software.
Bad Points Cartridge wastage. Driver.
Conclusion Well worth considering.
★★★

Personal
Computer
World
Highly
Commended

Canon BJC-4300

Not only is this a printer, but with the addition of an optional cartridge, it is also a scanner. The cartridge replaces the single printhead incorporating two (one CMY, one black) inkwells. Catz, PrintMaster and fonts are bundled.

Printing was fairly speedy, with a standard-quality page from Word arriving in 36 seconds. A one-page printout from Excel at the same resolution took 1'03" minutes, producing very clear text. The edges of the characters were sharp and unfeathered on photocopy paper in both this and high resolution. "High" offered an even ink distribution, with larger letters coming out darker and more solid, while draft quality was light and jagged and would not be suitable for everyday correspondence.

Photos were disappointing. Using Canon's bubblejet paper, the output was speckled with white. Colours were dark and unrealistic. Business graphics suffered a similar fate: the black was not solid and the fading bars were visibly stepped. Standard quality on photocopy paper and high quality on bubblejet paper both lost the inverse hairline, while standard quality showed banding in our blocks of solid colour.



Although not as quick as using a flatbed scanner, the scanning cartridge is certainly much cheaper and can scan any standard paper size up to A4 — much wider than a handheld scanner. A 180dpi (360dpi max) colour scan of an A4 sheet took just 3'54" and could be saved as either BMP or TIFF format.

The included scanning software allowed for basic adjustments including image sharpness, and edge and line enhancements.

A voucher offer allows buyers to claim money back against the cost of a Thomas Cook holiday, and buying the printer and scanner together attracts a further saving of £30.

PCW Details

Price £233.83 (£199 ex VAT); scanner cartridge £104.57 (£89 ex VAT); printer and scanner together £304.33 (£259 ex VAT)

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

Good Points Optional scanner.

Bad Points Poor graphical reproduction.

Conclusion Worth spending a bit more for the scanning cartridge.

★★★★

Epson Stylus Color 300

A boxy machine with a small footprint and a 100-page cut-sheet feeder, this model is destined to replace the Stylus Color 200. The first thing that struck us on unpacking the unit was the single CMYK print cartridge. Combined black and colour cartridges like this prove to be more expensive in the long run than buying two separate units, as running out of one colour will invariably necessitate discarding three further wells that might be hardly touched. A screen graphic visible during printing should display both the progress and the amount of ink left in the cartridge, but in our tests this still showed the wells to be full when the magenta had run dry.

Printing is frighteningly slow. The economy, or draft setting (which is of a similar quality to 24-pin dot-matrix draft output) took longer to print a single page than it took both the HP890C and the Lexmark 7000 to print five draft sheets. The high-quality setting, the standard of which was comparable to the HP890C's draft output, took just under three quarters of an hour to print five pages: that's nine minutes per page! In normal quality, the small print on our spreadsheet was clear



and easy to read, but in all instances, text printed on normal paper had slightly feathered edges.

Graphics were handled well, with strong steady colours and clearly differentiated fades and shading. In both normal (360dpi) and fine (720dpi) quality the inverse hairline was clearly visible, which demonstrated good graphics handling. The price for this, though, was the speed, which reduced to a crawl, with a slightly dark fine-quality print of the A4 photo taking over 20 minutes, although even with 100 percent ink coverage the pages did not curl.

PCW Details

Price £186.83 (£159 ex VAT)

Contact Epson 01442 61144 www.epson.co.uk

Good Points Good business graphics.

Bad Points Very slow on text. Four-colour cartridge.

Conclusion Disappointing-quality output overall.

★★

Hewlett-Packard DeskJet 890c

Holding two cartridges (black and CMY), the DeskJet 890C is much easier than some of its predecessors as all sockets have been moved from the underside to the back of the unit. On the downside, these new models never seem quite as sturdy as the old 500 series.

The driver comes complete with 126 fonts and Fontsmart, a font management utility that offers HP LaserJet font compatibility and places fonts that are used less often where they will not take up system memory, while still being easily accessible to the printer. Meanwhile, the Toolbox allows users to do everything, from installing and aligning print cartridges to changing print settings from a simple Windows interface.

The 24MHz RISC processor and 0.5Mb RAM speed things up with five "Economode" copies of a one-page letter arriving from Word in just 56 seconds. Their quality makes the setting perfectly acceptable for use in everyday correspondence. The average time taken to produce the same document in Normal and Best quality is 25 and 27 seconds per page respectively. Print quality is fine, with clear, sharp



edges and good definition of the very small text on our Excel spreadsheet.

Selecting premium-quality paper automatically set the print quality to Best and produced realistic colours with smooth gradation of tone. To output an A4 photo of this quality took 9'36". The white margin in the example was just 1mm at the top, 3mm and 4mm on the left and right sides, and 10mm at the bottom. In the CorelDraw test it managed to print the inverse hairline without problems in normal mode, but in Best on premium paper it was difficult to see.

PCW Details

Price £399.50 (£340 ex VAT)

Contact Hewlett-Packard 0990 474747 www.hp.com

Good Points Fast. Good colours. Almost full paper coverage.

Bad Points A little expensive.

Conclusion We were impressed.

★★★★

Lexmark 1000 Color Jetprinter

Small, streamlined, space-age: the Lexmark 1000 has only one button which is used for feeding the paper — no power switch or lights and indicators. Supplied with a CMY cartridge (it holds only one at a time), all blacks were composite. As a result, they were characterised by a slight greenish tinge.

In draft mode it was easy to see the CMY making up the black letters where the three colours had feathered individually at the edge of the characters. Normal quality was fair but by no means crisp, and High was equally disappointing. The black was still not deep and the overall output was dull, lacking the impact of many of the other printers in the group. Towards the end of the high-quality print test, it was sucking in the pages two at a time. Nine files were missing from the installation disk so we had to download a 1.2Mb file from Lexmark's web site before we could use the 1000. Print speeds were fair but unspectacular. The average



Normal quality page from Word arrived in just under two minutes, while the A4 photo took 20 minutes. The strength of this printer is its business graphics capabilities. The full-page CorelDraw file arrived in 3.56 minutes — just over half a minute longer than it took to deliver a single page from Excel and with slightly wrinkled paper. The A4 control photo came out very dark.

A graphical screen display accurately charts printing progress and the amount of ink left in the cartridge. The driver offers a choice of 21 predefined paper sizes including banner printing, with paper types ranging from plain to greetings cards and encompassing transparencies and iron-on transfers.

PCW Details

Price £129 (£109.79 ex VAT)

Contact Lexmark 01628 481500
www.lexmark.co.uk

Good Points Small and neat.

Bad Points Only CMY cartridge supplied. Disappointing print quality. Dark photo reproduction.

Conclusion Fair performance.

★★★

Lexmark Color Jetprinter Series 7000

This two-cartridge printer can be filled with CMY and a black or photo cartridge. This makes it faster than the 1000, slashing print times to 21 seconds for a Normal quality page from Word, and 2'49" for a Standard quality page of business graphics from CorelDraw.

Normal quality is excellent, with good, dark black letters with sharp edges. The four-point text in our Word document was very clear and easy to read. Although there was a noticeable drop in quality after selecting Quick Print 600, the 7000's draft mode which produced slightly grey text with fuzzy edges, there also was no discernible improvement on Normal when we selected High.

The inverse hairline in the CorelDraw test was extremely clear in both normal and high quality, but while the gradation of the faded colours was impressive under Normal, it was noticeably stepped at high quality on premium inkjet paper.

Compared to the 1000 this is a large printer, but it benefits from a



larger paper input tray (supplemented by single-sheet hand feed), an output tray, power and paper advance buttons and two indicator lights. Like its smaller brother, though, it suffered from rather dark output when printing our A4 photo. The blue sky was thunderous and, in parts, almost black. Although not quite as red as the sample produced by the 1000, our image reference was straying away from light brown and towards that end of the spectrum.

Nineteen preset paper sizes are supplemented by a Custom setting and six media options.

Included is a copy of LivePix for photo manipulation. Although currently top-of-the-range, the 7000 will be joined by the 7200 at the start of November, offering higher resolution for photo reproduction.

PCW Details

Price £299 (£254.46 ex VAT)

Contact Lexmark 01628 481500
www.lexmark.co.uk

Good Points Large paper tray. Good business graphics and text.

Bad Points Dark photo reproduction.

Conclusion Well worth considering.

★★★★

Lexmark 2030 Color Jetprinter

The largest of the three Lexmark machines in the test, the 2030 comes with three cartridges (black, photo and CMY) and holds two of them at any one time. A storage case is supplied to hold the third when not in use. Driver installation was fiddly until we copied all of the relevant files from the CD into a temporary directory and started again.

The three common (Draft, Normal, High) quality settings are supplemented by Presentation mode which produced five pages from Word marginally faster than the High quality mode. A single page at Normal quality arrived in 39 seconds, while from Excel it took 1'11". Quality was never particularly sharp, and slight pixellation was visible at all settings, especially on smaller text. Draft mode gave a nice black print but the pixels were slightly misaligned.

The on-screen display of our ink resources was inaccurate, indicating that we still had a full cartridge when the magenta had already run dry, but the graded tones produced by CorelDraw were



smooth and there was no evidence of stepping. The inverse hairline was clearly visible in both Normal and High quality modes using either normal or coated paper, but the composite black lettering had distinctly ragged edges.

Even in Presentation mode, using the photo cartridge and photographic paper, the A4 image from Photoshop looked grainy and showed slight banding. That said, the range of colours printed was impressive and the whole image had a lighter, more realistic feel to it than the other Lexmarks in the group.

The 2030 has no buttons or lights at all, but is supplied with a copy of LivePix, a photo collage package for distorting and arranging images.

PCW Details

Price £169 (£143.83 ex VAT)

Contact Lexmark 01628 481500
www.lexmark.co.uk

Good Points Holds two cartridges.

Bad Points Ink monitor.

Conclusion Nice all-round performer.

★★★

Editor's Choice

A number of factors must be considered when selecting which printer from such a wide variety of machines should have the honour of being Editor's Choice. Speed and quality, of course, play major roles, but so does paper handling, running costs and the range of functions a printer can fulfil. Those with photo cartridges or those that can print on a wide range of media are particularly useful, but the majority of home or small office printing will often be simple monochrome output from text-based applications. Separate black and colour cartridges, and especially a capacity to hold both at the same time, is therefore a particularly desirable feature.



We highly commend the Alps MD-1000, whose sister, the MD-2300, was also Highly Commended in September 1997's PCW colour printer group test. For business graphics it

is unquestionably our first choice, being the fastest and offering the highest quality of any printer in the test. The ability to use metallic colours and white, which makes it possible to print photos and graphics on dark media, make it unique in this group test.

We also highly commend Canon's BJC-4300. It was not the quickest, producing middling results in all of our tests, but the quality of its textual output was good in all but draft mode. The bundled software is both useful and fun to use, although the unit was ultimately let down by the disappointing quality of its graphical output.

A Highly Commended goes to Hewlett-Packard for the DeskJet 890C. The range of improvements on earlier models, including 70 percent smaller dots and extensive software enhancement, combined with its 24MHz RISC processor and built-in 512Kb RAM, make it an excellent buy for heavy-duty users who will also benefit from its outstanding paper-handling capabilities. Its draft printing is also of sufficient quality to save users ever needing to use normal or high quality for their everyday text-based printing.

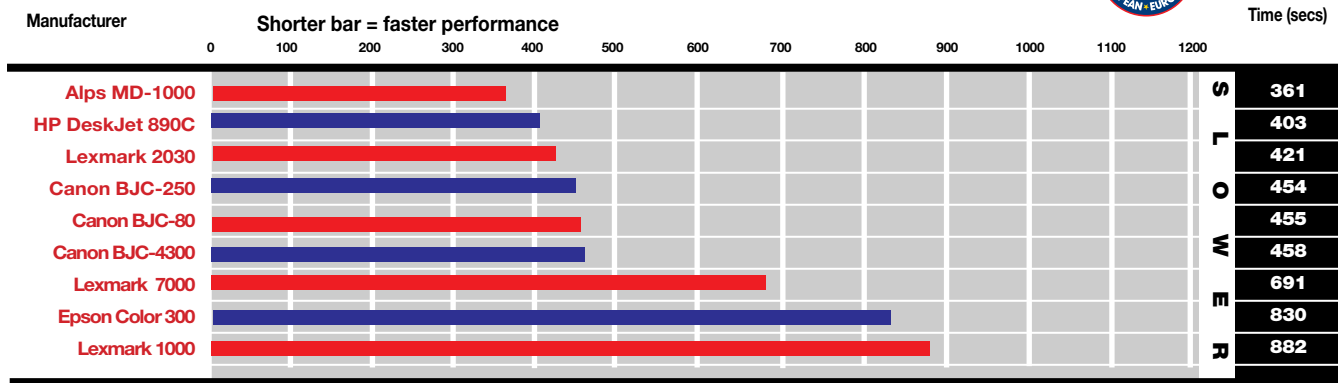
Editor's Choice is awarded to the Canon BJC-80 (pictured, left). The smallest of the group, it demonstrated excellent text and graphics handling. The optional scanner cartridge makes it a cost-effective and space-conscious alternative to buying two separate units, and although the sheet-fed scanning process is somewhat slow, it should be all most home users will ever need.

The optional 200-page battery pack and infra-red communications port make the BJC-80 the ideal machine for notebook users who want to make hard copies away from their desks. One can't help wondering how Canon has managed to squeeze so many features into such a small space.

Nik Rawlinson



Performance Results — CorelDraw



Performance Results — Word

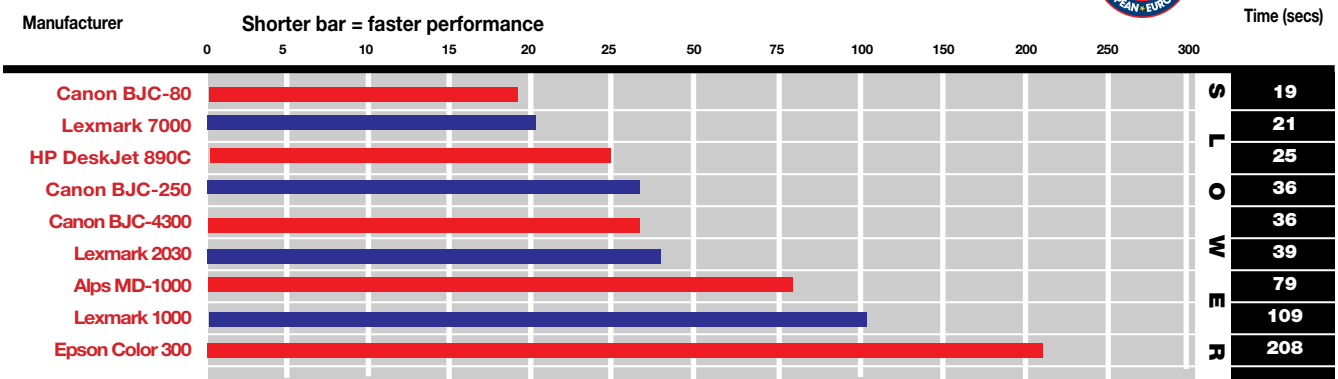


Table of Features				
Personal Computer World Highly Commended		Personal Computer World Editors Choice		Personal Computer World Highly Commended
Manufacturer	Alps	Canon	Canon	Canon
Model	MD-1000	BJC-80	BJC-250	BJC-4300
Telephone	0800 973405	0121 680 8062	0121 680 8062	0121 680 8062
URL	www.alps.ie	www.canon.co.uk	www.canon.co.uk	www.canon.co.uk
RRP (inc VAT)	£299 (£254.47 ex VAT)	£233.85 (£199 ex VAT)	£163.33 (£139 ex VAT)	£233.85 £259 ex VAT
Max resolution (dpi)	1,200 x 600	720 x 360	720 x 360	720 x 360
Min resolution (dpi)	300 x 300	720 x 360	360 x 360	720 x 360
No. of colours	9	4	4	4
No. of cartridges	4	1	1	1
Photo specific cartridge	●	○	●	●
RAM req by driver	8Mb	Win 3.1 compatible	Win 3.1 compatible	Win 3.1 compatible
Size (h x w x d) mm	190 x 449 x 280	57 x 300 x 158	171 x 361 x 215	203 x 383 x 232
Costs				
Mono cartridge	£4.11	£28	£19	£26
Mono refill	N/A	£4	N/A	N/A
Colour cartridge	£4.70	£34	£24.99	£40
Colour refill	N/A Metallic £6.46	£5.00	N/A Photo £24.99	Black £5.40 CMY £15.00
Special cartridges	White £7.64 Finish £4.68	Scanner £104.57 inc	Flourescent £24.99	Scanner £104.57 inc Photo £27.99 Flourescent £33.99
Paper tray capacity	100	30	100	100
Max print area (mm)	203 x 270	203 x 287	203 x 284	203 x 287
Drivers				
Windows 3.1	●	●	●	●
Windows 95	●	●	●	●
Windows NT	Early 1998	○	○	○
OS/2 / other	○	○	○	○
Ink saving mode	○	○	○	○
Warranty	1 year	1 year Int'l RTB, parts/labour	1 yr RTB	1 yr RTB
Bundled software	T-Shirt maker (PC) Print Artist (PC) PhotoDelux (Mac)	None	Catz, PrintMaster Thomas Cook Voucher	Catz, PrintMaster Thomas Cook Voucher

Table of Features					
Personal Computer World Highly Commended		Personal Computer World Highly Commended	Personal Computer World Highly Commended	Personal Computer World Highly Commended	Personal Computer World Highly Commended
Manufacturer	Epson	Hewlett-Packard	Lexmark	Lexmark	Lexmark
Model	Stylus Color 300	DeskJet 890C	1000	2030 PE	7000
Telephone	01442 261144	0990 474747	01628 481500	01628 481500	01628 481500
URL	www.epson.co.uk	www.hp.com	www.lexmark.com	www.lexmark.com	www.lexmark.com
RRP (inc VAT)	£186.83 (£159 ex VAT)	£399.50 (£340 ex VAT)	£129 (£109.79 ex VAT)	£169 (£143.83 ex VAT)	£299 (254.46 ex VAT)
Max resolution (dpi)	720 x 360	600 / PhotoRET	600 x 600	600 x 300	1,200 x 1,200
Min resolution (dpi)	360	N/A	N/A	N/A	N/A
No. of colours	4	3	3	6	4 + Photo
No. of cartridges	1	2	1	2	2
Photo specific cartridge	○	○ - built in	○	● included	●
RAM req by driver	16Mb	N/A	N/A	N/A	N/A
Size (h x w x d) mm	347 x 206 x 162	376 x 444 x 226	170 x 360 x 175	188 x 462 x 238	305 x 432 x 267
Costs					
Mono cartridge	See colour (CMYK)	£21.20	£20.20	£20.20	£18.73
Mono refill	N/A	N/A	N/A	N/A	N/A
Colour cartridge	£18 (CMYK)	£25.80	£21.89	£21.89	£22.59
Colour refill	N/A	N/A	N/A	N/A	N/A
Special cartridges	None	N/A	N/A	Photo - £25.26	N/A
Paper tray capacity	100	150	30	100	150
Max print area (mm)	216 x 356	266 x 356	203 x 280	203 x 282	203 x 282
Drivers					
Windows 3.1	●	●	●	●	●
Windows 95	●	●	●	●	●
Windows NT	○	●	●	●	From Jan 98
OS/2 / other	○	MSDOS	○	○	○
Ink saving mode	○	●	●	●	●
Warranty	1 year RTB	1 year	1 year on-site	1 year on-site	1 year on-site
Bundled software	None	FontSmart	None	None	None

Key: ● Yes ○ No



Fun and **games**

There's lots of fun stuff on sale at Christmas, and if Santa were less of an honest man, he would be tempted to run off with some of these PC goodies.

Christmas is a time for giving and, of course, receiving. But it's also one of the best times for learning and playing, so this month we take an extra-special look at what you might like to give, or receive.

No Christmas computer season would be complete without a bit of gameplay, so this year we've reviewed a wide variety of games to help you decide which ones will be top of your Christmas list and which will not. We give you the lowdown on the forthcoming

Tomb Raider II and the controversial Postal, as well Riven — the thinking-person's game.

And what's a game without a joystick? Check out our peripherals round-up on page 164 and find out what's shaking with the new force feedback joysticks and the PC Dash gamepad.

For those more into learning curves than high-speed bends, you'll certainly want to read our round-up of this year's best educational and reference CD-ROMs on page 166.

p159 >

Tomb Raider 2 starring Lara Croft (Preview Edition)



The title alone should provide some indication of what will be the major draw for a certain proportion of the male population. Core Designs has gone the way of Hollywood and is giving a buxom bundle of pixels, one of its greatest assets, equal billing to the name of the game. And who can blame them? The

Lara Croft Appreciation Society web site boasts over 47,000 hits and rumours are rife that Demi Moore is in negotiations to play the character in a forthcoming film.

Whether that is true or not is up for debate, but sometimes the hype can be justified and this looks like one such occasion. With dynamic lighting, Lara can now use flares

to light up dark corners. New-found skills mean she can scale walls, and weapons like underwater harpoons give her a more dangerous edge, too.

The gameplay is admirable and there is the promise of an intricate

It's enough to drive you up the wall!

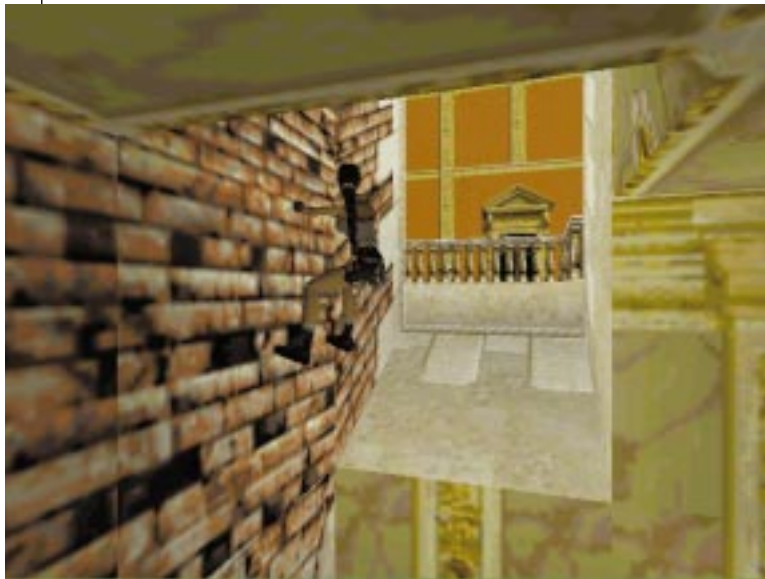
storyline to match.

Set across two continents, Lara searches for the Dagger of Xian, a legendary artefact said to bring the power of the dragon to whosoever plunges it into their heart. *Don't try this at home, kids!*

We were playing a preview but the full version will see her travel through China, Tibet and Venice. There's even one whole level set in the scene of a sunken ship, where she is pursued by adversaries, racing to get to the dagger before her.

Eighteen new levels, many refinements, realistic sounds and super-smooth movement makes this game a must for all Tomb Raider fans, and for those who have never met Lara before, it looks like you're in for a treat. Watch out for a full PCW review upon release.

Nik Rawlinson



PCW Details

Price £39.99

Contact To be sold through retail outlets (tba) from the end of November.

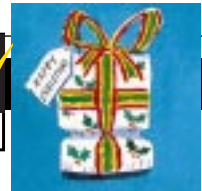
www.tombraider.com

System Requirements Windows 95, 16Mb RAM, quad-speed CD, P90 minimum (133 recommended).

★★★★

International Rally Championships

Personal Computer World Recommended



Several months ago, I lost a considerable amount of quality time (normally spent with my bed) thanks to Network Q RAC Rally Championship. Under the innocent surface beats the heart of a superbly addictive and exciting racing game. The graphics are excellent, gameplay is just right, and the hookability factor is distressingly high.

I'd just about weaned myself off it when the sequel arrived, this time lacking the official Network Q RAC sponsorship and TV's Tony Mason as co-driver with words of wisdom, but making up for it with improvements all round in gameplay.

Unlike its predecessor, which could speed along in DOS mode, International Rally Championships (IRC) is for Windows 95 only.

Using DirectX 5 and supporting MMX, IRC requires at least a 16Mb P100. This is just about sufficient, but to have all the visual options switched on, you'd be better off with at least a P166. IRC really comes into its own with a 3D graphics card.

International tracks take you across the deserts of Egypt, over Swiss mountain passes, through Indonesian jungles and

skidding around Finland (the green hills of England also get a look-in).

There's the choice of nine cars from the current rally season and each are beautifully modelled, with independent suspension and realistic handling. A variety of racing modes includes the new Championship mode which swaps time limits for fuel stops. You can play with eight people across a network, or two via a serial link or split-screen mode.

IRC includes a track editor for creating custom circuits — a neat idea, but I just wanted to get on with the game. It's superb. The programmers at Magnetic Fields must once again be congratulated. At least I suited the bags under my eyes!

Gordon Laing



Say goodbye to Tony Mason as well as to several nights' sleep

PCW Details

Price £44.99

Contact Europress 01625 859333

www.europress.co.uk/

System Requirements Pentium 100, 16Mb RAM, Win95, CD-ROM drive, 16-bit sound card.

★★★★★

Riven



Riven is billed as the sequel to *Myst*, but requires no previous knowledge of the game. Arriving on Temple Island you find yourself imprisoned in a cage. Fortunately, someone releases you before disappearing, leaving you wondering what that strange, cone-shaped, device can be. Why does it have an eyepiece? Why don't the levers do anything? At this stage you'll probably wander off to ponder the puzzle of the room with five entrances but only two exits... Or is it the other way around? And

what are all these mysterious daggers? You can't seem to pick them up (there's no combat or other violence in this game) but they seem to indicate something useful.

Sooner or later you're going to find a mode of transport between the islands. What can these pairs of cables be, which snake across the sea? What are those creatures basking on that rock? Move carefully or you'll frighten them away. Who left these strange, wooden eyes around, and what do they signify?

Observation is everything in this game: almost every event has significance and every lever and handle needs to be pushed or pulled. The puzzles are fiendishly subtle and the atmosphere

**Virtually real:
The
compelling
world of
Riven**

and attention to detail is riveting.

Vintage machinery abounds, with bronze and steel bearing the patina of age and satisfyingly scraping and hissing as it lumbers into action. Rock and wood textures are meticulously rendered with breathtaking lighting effects. The animation is stunning: the rides on the cable cars dip and sway, accelerate and slow down as the car travels the catenaries of the cables. Water shimmers and flows, insects and birds buzz around the scenes in near-video quality.

Riven is huge, with five CD-ROMs, and it's fiendishly compelling. Don't buy this if you value early nights.

Tim Nott



PCW Details

Price £44.99

Contact Broderbund 01784 431000

www.riven.com

System Requirements PC: Windows 95, P100, 16Mb RAM, 75Mb hard disk space, DirectX compatible video and sound cards. Mac: System 7.5, 90MHz PowerPC, 9Mb free RAM, 65Mb disk space. 4x CD-ROM, 640 x 480 display

★★★★★

Postal



Stop for a moment and cock an ear in a westerly direction. You might just be able to make out the commotion that this game has caused in the United States.

The term "postal" refers to a number of postmen who went berserk, venting their frustrations by shooting their co-workers. It's a worrying social phenomenon and now it's also a game for your PC. You play the role of a guy who's gone postal, whose only wish is

to kill and maim as many people as possible. That's the plot — it doesn't get any more complicated.

At the beginning of each level you are given the number of "hostiles" that you need to polish off in order to get to the next level. Your victims will writhe in agony for a while before dying, shouting "Aargh, my leg!" or "Aargh, kill me now!" (similar to the way I felt after playing *Postal* for a couple of hours).

The gameplay betrays an appalling lack of

imagination: the game environment looks pretty enough but there's no interaction. You can't even knock the head off the snowman

**You play one
bad dude in
a really bad
(and we
mean bad)
game**

on your lawn, and the movement of the characters is

about as convincing as my Gary Glitter toupée.

The violence in *Postal* means the makers recommend that only people over the age of 17 should play this game, but I think that is unnecessarily harsh on us adults: why should we have to play it when children can get off scott free?

The controversy surrounding *Postal* in the United States is understandable and, as is always the way, provides excellent publicity. A far better way of suppressing it is just to tell the truth: it's a terrible game. Don't waste your money.

Adam Evans



PCW Details

Price £34.99

Contact Take 2 Interactive Software Europe

www.runningwithscissors.com

System Requirements Windows 95 or NT, 90MHz processor (166MHz recommended), 16Mb RAM (32Mb recommended), 2X CD-ROM drive (4X recommended), SVGA display, SoundBlaster-compatible sound card.

No rating

Perfect Assassin

Fans of the comic series *2000AD* will want to get their hands on Perfect Assassin, the brainchild of Kev Walker, concept artist for the movie, Judge Dredd.

Set in the rotating city of Kar-Es-Taal, you direct Charon, the last surviving human in the galaxy, on his mission to protect the power source of the universe.

Richly illustrated, the superb graphics, smooth-scrolling and simple-to-use interface help you get straight into this mostly graphical, part-textual strategic adventure. Believable sounds add to the reality, and we were glad to discover that it is largely free of irritating background music.



Sometimes you just have to get nasty

You cruise the city, interacting with characters, asking them for help or for objects and directions that you need to complete your mission. If they prove to be uncooperative, you could use your gun, but beware: the militia maintains the peace, so killing another character could result in suffering a similar fate yourself.

All control is through the mouse: move, shoot, use objects in your inventory, and chat to people using simple cursor movements and

single clicks. What is disappointing is that some characters are too busy to talk, which forces you to search for someone who *has* got the time to chat. When you eventually do get to have a conversation, you must read the subtitles to understand what is being said. And no matter what the content of a sentence, what you hear as a gameplayer often seems to be the same.

This is a spectacular game, with all the elements of what ought to be an entertaining science-fantasy romp. But there is something lacking, and the need to carry out "research" as you progress, although innovative, did not help to fire up my imagination. It just left me feeling uninspired.

Nik Rawlinson



PCW Details

Price £39.99

Contact Grolier Interactive 01865 264800
<http://gi.grolier.com>

System Requirements 486 DX2 66, 8Mb RAM (Windows 95), 16Mb (DOS), 20Mb HDD, CD-ROM, 16-bit sound.

★★★

Fin Fin on Teo, the Magic Planet

Virtual pets are appearing in truck-loads these days.

We've all heard of the Japanese Tamagotchis, some may have seen Hewlett-Packard's MoPy fish. Now, the hottest thing to hit the market is Fujitsu's Fin Fin.

Fin Fin is reputed to be the most advanced form of artificial life available in entertainment technology today. Not only do you have to feed and play with him, you also have to sing and talk to him. A special microphone and Fin Fin whistle are supplied.

Fin Fin seems to be a cross between a dolphin and a bird and lives on the planet Teo. It consists of three special places: the happy Amile Forest, which is Fin Fin's favourite place and the ideal setting to get to know your new friend; the enchanting Tsubu Woods, where Fin Fin eats; and the water hole of the Secret Inlet where Fin Fin will go to catch fish or be alone.

Over time, you will build up a lasting



He flies, he smiles, and he will sing to you. He is very friendly, too — your kids will love him

friendship with this little animal. In return for food and attention he will sing for you, dance for you and do the odd trick. If you're lucky, you might even get to meet Mrs Fin Fin! A bioscan will let you know how happy Fin Fin is and whether he is in need of anything.



Fujitsu's proprietary artificial life technology replaces the traditional keyboard and mouse interface. You communicate with Fin Fin through sound and motion by using the SmartSensor.

This game is magic and will teach kids the skills of patience, communication and friendship building. Fin Fin could be a friend for life! Ideal for kids aged five and upwards.

Etelka Clark

PCW Details

Price £29.99

Contact Fujitsu 01344 475000
www.fujitsu-interactive.com/finfin.html

System Requirements Windows 95, CD-ROM drive, 16-bit sound card.

★★★★



Chasm — The Rift

The ominously titled Chasm — The Rift is the latest game from Digital Integration and an experience for which the term “bloodthirsty mass homicide” seems hopelessly redundant.

You play a marine whose task it is to infiltrate the bases where time-meddling mutants have taken over, defeating the zombies by completing a number of missions, all seemingly codenamed Certain Death.

There is a full complement of weapons to collect, all of which come in handy when being attacked by the murderous locals.

There are ordinary “grunts”, jet-powered baddies and

“ ‘Ere... You lookin’ at me?!”



unstoppable chainsaw-happy types to defeat. The chunky 3D rendering (in 640 x 480 pixels) displays in an array of rich colour and together with the object-linked stereo soundtrack, unsettles and deafens in equal measure.

One of the more interesting features of this game is the game editor included in the software, which allows you to design rooms, aliens, and even your own lighting. There is also the option of bringing a text box up on-

screen while playing, through which a range of commands can be entered. If you become frustrated by being hideously dismembered every ten minutes, just enter the invincibility or the invisibility commands. Even though immortality has its appeal, it does take willpower not to blast your way through the levels and finish the game without even having worked up a sweat.

An important point to note is that Chasm can run in either DOS or Windows, so it’s even possible to enjoy large-scale decapitation on a 486. This is a game that deserves to be played on as many PCs as possible because it’s a scream-laden, trap-ridden, blood-spattered terror for which the designers deserve no little praise.

Paul Trueman

PCW Details

Price £29.99

Contact 01276 684959 www.digint.co.uk

System Requirements 486DX/4-100 (Pentium recommended), VGA/SVGA display, 16Mb RAM, 75Mb free hard drive space, MSDOS 5.0 or Windows 95, double-speed CD-ROM.

★★★★

Virtua Fighter 2

Having established itself as the undisputed heavyweight champion of the arcades, Sega is now playing for a large slice of the PC games market. Following its success with Sega Rally and Virtua Cop, Sega’s latest move is a conversion of the smash-hit beat-em-up, Virtua Fighter 2.

With ten fighters from which to choose, each with over 60 moves, there is a lot to get

your teeth into. Characters on offer range from Kung Fu masters through to Canadian wrestlers and fancy Frenchmen, each with their own fighting styles. The idea behind the game is simply to select your favourite and then take on the other nine fighters in a bout of hand-to-hand combat.

Unfortunately, the character selection screen is about the only thing that runs at the original arcade speed. As with other Sega

titles you can change graphic detail to suit your PC, but anyone expecting arcade quality will be severely disappointed. Even on a 300MHz Pentium II we couldn’t achieve a decent

performance with all the options turned on. What’s more, there’s no support for 3D graphics cards, which are designed specifically for this type of game. However, once you’ve reduced everything to the bare essentials, the game plays just as it did in the arcade. It’s easier (we managed to finish it in just under ten minutes) and all the tricks and tactics that worked on the original seem to work here. The excellent soundtrack is included, as are the sample voices.

Compared with its console counterpart, Virtua Fighter 2 for the PC is a big disappointment when played on today’s machines. But it will be interesting to see how it performs on next year’s new PCs.

Chris Cain



“No, please, Missus... I can’t take any more”

PCW Details

Price £39.99

Contact Sega 0181 995 3399 www.sega-europe.com

System Requirements Windows 95, Pentium 90 or better, 16Mb memory, 16-bit SoundBlaster compatible sound card, 2X CD-ROM.

★★





Sidewinder Force Feedback Pro



There are two force feedback joysticks currently on the market, with more on the way. But naturally, Microsoft is one of the first to market. And why not? Force feedback is a component of Microsoft's DirectX 5.0 API (application programming interface) and it makes sense that it would have the jump on the rest of the competition. The

Sidewinder Force Feedback Pro is truly a joy to use. The stick fits comfortably in the hand (right hand, that is) and all the buttons are within easy reach of one another. There are five buttons on the stick: a trigger, one eight-way button and three thumb buttons. On the base — which is, admittedly, a bit large — are a further five buttons and one adjustable knob which can be used as a throttle. All the buttons are programmable via the Sidewinder Pro profiler, which allows you to select and record a variety of button sequences that can be used in the various games you play. This can be handy in a game like Quake, where one push of a button can launch you into a death-defying jump, sidestep and shoot action. The joystick is digital, so no clumsy calibration is required. You'll also find

the action very precise. The forces, like the CH stick, vary from soft to hard vibration, push and pull, jolt, and stiff. If you're into flight sims or serious shoot-em-ups, this is the stick for you. It makes for very addictive game-playing.

Dylan Armbrust

PCW Details

Price £130

Contact Microsoft 0345 002000
www.microsoft.com

★★★★★

Force FX



This has to be the biggest joystick we've ever seen, with a massive footprint of 9in x 9in. There is a separate power adapter and two 7ft connection cables: the feedback effects require simultaneous connection to your games port and a spare serial port. There are six built-in force feedback effects: Jolt (running into a wall), Vector Force (the pressure you feel in pulling Gs in your jet fighter), X & Y Vibration (driving over bumpy roads), Spring (stiff airplane throttle), Button Reflex (recoil from firing guns) and Buffeting explosions and air turbulence). The grip and buttons setup is modelled on CH Products' F-16 joystick range and incorporates two four-way switches, five fire buttons, a trigger and trim controls. The push buttons are rated to ten million presses and the four-way switches are rated to one million presses in each direction. Supported games include Need for Speed SE and Flying Nightmares 2, and the pick of the upcoming titles must be Outlaws, the wonderful western adventure from LucasArts.

Adam Evans

PCW Details

Price £149.99

Contact Dimensional Services
01844 345406
www.chproducts.com

★★★★★

Virtual Pilot Pro



Here's a handy multi-function device. The Virtual Pilot Pro wheel, from CH Products, can help you fly in those complicated flight sims or drive along in auto racing games. It has six fire buttons, two four-way switches, a realistic flight yoke, a throttle and a pair of sturdy desk clamps to keep you in the air, not on the floor. For the real highflyers, you'll even find elevator and aileron trim controls, giving you all the simulation options you could want. It works, it's cheap, and it's fun.

Dylan Armbrust

PCW Details

Price £104.95

Contact Dimensional Services
01844 345406

★★★★

PC Dash

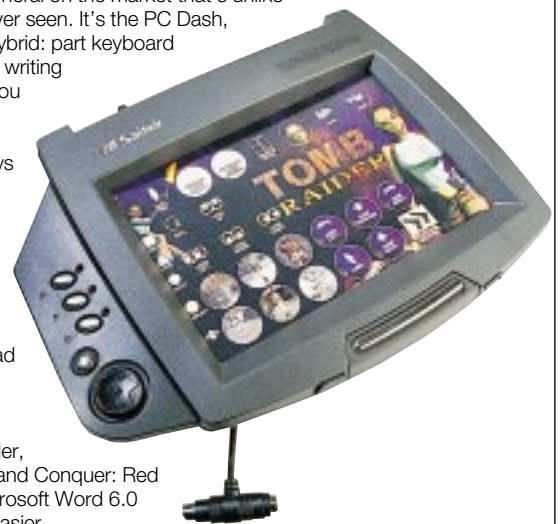
There's a whole new kind of peripheral on the market that's unlike any joystick or gamepad we've ever seen. It's the PC Dash, from Saitek. This peripheral is a hybrid: part keyboard and part gamepad. It's a bit like a writing tablet in shape and size, except you don't need to write. It's designed to take the arduous task of remembering which keyboard keys you need to push to operate a game's various functions.

To operate PC Dash all you do is plug it into the keyboard socket, load the software and insert a game sheet into the unit. Each game sheet has a specific bar code on the back which is read by a scanner on the Dash. Once enabled, it's ready for action. It comes with ten pre-programmed game sheets, such as Tomb Raider, Quake, Interstate 76, Command and Conquer: Red Alert, and MDK. It even has a Microsoft Word 6.0 sheet to make word processing easier.

There are three buttons and a gamepad on the left that handle the main functions, like look, draw, and escape, while the gamepad handles movement. On the bottom is a large, long button, like a space bar, that usually handles the fire control.

PC Dash is a good idea but it takes a bit of getting used to, and we found the gamepad to be a bit unresponsive. Also, because the Dash is flat, there is an anti-intuitive feel when pushing a function button, unlike that of a keyboard. But for those who are patient and hate using a keyboard when playing games, you might want to check it out.

Dylan Armbrust



PCW Details

Price £49.99

Contact Saitek 01454 855050
www.saitek.plc.uk

★★★★

The Best Reference Tool of 1997

The primary reference source is an encyclopedia and the best encyclopedia you can buy — on or off the computer — is Encarta. Firstly, to all intents and purposes, it's British, so you don't get loads of largely irrelevant American entries, and it is updated every year. If you are on the internet you can download monthly entries that keep it slap bang up to date. Millions of words, thousands of photographs and hundreds of maps, along with charts, tables, photos, illustrations, 360-degree views, videos and animations, sound clips, guidance to good related web sites... you can just go on and on. There are two versions for 1998: Encarta 98 Encyclopedia (£49.99) and Encarta 98 Encyclopedia Deluxe (£79.99). The difference is that the latter has more multimedia content and comes with the Research Assistant, a useful application designed to help you organise your research notes, keep proper source citations, and organise the information in an outline from which you can construct a report.

A superb alternative is the two-CD-ROM World Book Multimedia Encyclopedia from IBM (£49.99). It has been localised in Britain, relates to the school curriculum, is packed with solid information, illustrations — many of extremely impressive quality, graphics, animations, maps and videos. Downloadable monthly updates, indications to related web sites (not as good as Encarta's), a free month's trial of the Electric Library, and a truly superb resource of full-text newspapers and magazines are available. But be warned — you have to sign up for the trial and give your credit-card details.

If Microsoft's slogan "Where do you want to go today?" relates to anything, it's to the Encarta World Atlas, an absolute must-have at £49.99. Text, video, audio, photographs and maps take you anywhere you want to go and tell you everything you're ever likely to want to know.

Nestling next to the encyclopedia on your reference shelf is a dictionary, and the very best is the Oxford English Dictionary (£293.75), the most authoritative and comprehensive dictionary of English in the world. The CD-ROM version is nothing short of brilliant, providing the means to search quickly and simply by all sorts of criteria.

The New Shorter Oxford English Dictionary (£79.99) has half a million definitions and 7.5 million words of text, plus an anagram solver, a rhyming index and help with phonetics. Or the Concise Oxford English Dictionary (£19.99), now in its ninth edition, contains 140,000 definitions and spoken standard British pronunciation of words. The Chambers Dictionary



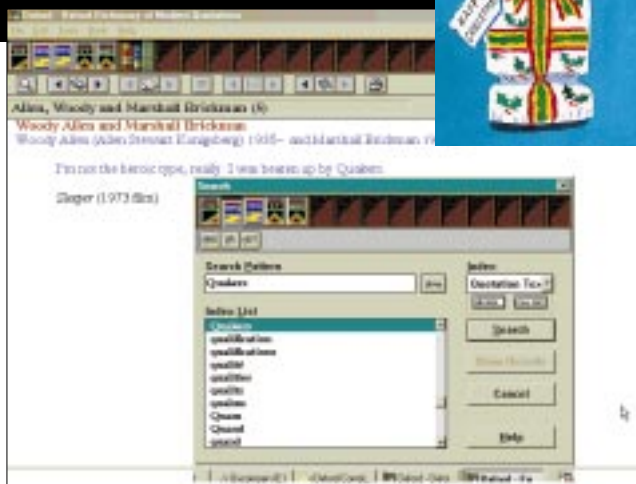
Above The OED: Expensive, but the most authoritative reference to words and their origins that money can buy



Below World Book Encyclopedia: Giving Encarta a run for its money

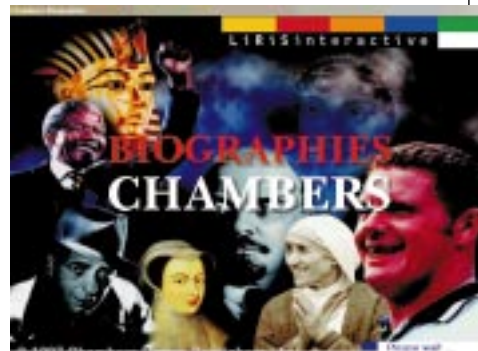
on CD-ROM (£29.99) is also a good choice.

The Oxford Compendium (£49.99) has reached version 3.0. It is a complete literary reference shelf on a single CD-ROM combining the Concise Oxford Dictionary (Ninth Edition), the Oxford Thesaurus, and the Oxford Dictionary of Quotations and Oxford Dictionary of Modern Quotations. A quick mention, too, of The Penguin Hutchinson Reference Library (£39.99). On a single CD-ROM you get Roget's Thesaurus, Longman Dictionary of the English Language, Penguin



Above Oxford Compendium: Quotations old and new, plus the Concise Oxford Dictionary and the Oxford Thesaurus, make this a bargain reference buy

Right, above Chambers Biographies: A great CD-ROM, but it can be up to a decade out of date, so look upon it as a historical resource



Right, below Encarta: The best encyclopedia on or off CD-ROM



Dictionary of Quotations, and Usage and Abusage, among many others.

It's difficult to get away from Oxford University Press when it comes to the best reference CDs. The Dictionary of National Biography, or DNB (£411.25) is one of the major historical and literary achievements of the last hundred years and documents the lives of nearly 40,000 people. The Who's Who 1897-1996: One Hundred Years of Biography (£293.75) provides a wealth of biographical information about people of influence in all walks of life. An alternative is Chambers Biographies (£49.99) containing 24,000 pocket biographies derived from no fewer than eight Chambers reference books. Sadly, some of the biographies can be up to a decade out of date.

A great many reference titles are devoted to specific topics such as music, space exploration, wildlife and conservation, even cooking and wine. Several newspapers are available on CD-ROM, others have an electronic edition. The answers to many questions are just a few mouse-clicks away.

Paul Begg



PCW Details

Microsoft 0118 9270 001 www.microsoft.com
 IBM 0800 214 887 www.ibm.com
 OUP 01865 267979 www.oup.co.uk
 Liris Interactive (Chambers) 0171 631 0878
www.liris.com/version/uk.htm
 Helicon (Penguin) 01865 204204 www.helicon.co.uk

The Best Children's CD-ROMs of 1997

Family encyclopedias like Encarta serve general-interest purposes, but fall short for those studying a subject in any depth. Nor are they written with children in mind. To fill the gap, Dorling Kindersley has launched a new reference program, Eyewitness Children's Encyclopaedia (£39.99). Written for 7- to 11-year-olds, it uses pictures and animation as well as text to explain information.

For those wanting more depth on topics, there is now a better choice across the school curriculum. Geography is well served by Globetrotter: The Complete Guide to all 265 Countries of the World (£19.99), published by Eaglemoss and distributed by Koch Media. This is typical of the latest reference programs aimed at 8- to 14-year-olds. Information goes hand in hand with Key Stage 2 and 3 of the National Curriculum. When children look up a homework topic, they are highly likely to find what they need; not often the case with family encyclopedias. History students can turn to the new Chronicle Encyclopaedia of History (£29.99), published by Dorling Kindersley, which covers Key Stage 3 upwards.

The three sciences have received mixed treatment. The juiciest of the three, biology, has received the lion's share of new titles. Bodyworks 6.0 (£29.99) is an updated version of The Learning Company's established title. With a better search engine and lots of rotating 3D anatomical pictures, this remains an excellent journey through the human body. A.D.A.M The Inside Story (£29.99) from Mindscape covers similar ground. For younger children interested in the animal kingdom, Amazing Animals (£29.99) from Dorling Kindersley is great fun. As well as having new games, the CD-ROM comes with stickers, a mobile and a fact book. New general-science programs which cover chemistry and physics as well as biology, include Hutchinson Science Library (£39.99), published in association with the Science Museum by New Media, and Dorling Kindersley's updated Eyewitness Encyclopaedia of Science 2.0 (£39.99).

Primary school numeracy and literacy, the subject of so many titles, has seen some useful new additions. Treasure Mathstorm (£29.99) from the Learning Company is an excellent program for practising mental arithmetic and building basic numeracy. The Learning Company has also localised its Reader Rabbit range (£24.99 each), which is unusual in that it begins at 18 months. Teletubbie fans will recognise the sound principle of repetition in the toddler program. There are also titles for pre-school and kindergarten age.

The arts have seen some excellent additions this year. IBM Brings You Crayola (£19.99 each), a series of four titles published by Iona, will keep children amused for hours and includes a fashion program aimed at girls. Broderbund's Orly's Draw A Story (£29.99) is innovative. It animates and incorporates your pictures into the narrative of four charming Jamaican tales retold by Orly and her friend, Lancelot the frog. Children find this fascinating.

Printpaks from Anglia Multimedia has introduced new titles including Printpaks Super Jewellery Kit (£29.99) and Printpaks The Lost World: Jurassic Park Iron-on Gear (£29.99). Last but not least, Disney's Magic Artist (£39.99) is a knockout with children of all ages.

The other main development in the market reduces the likelihood of serious learning from all those new educational titles. Fun learning may win out instead. Disney has already shown how well films translate to CD-ROM with Toy Story. Dreamworks Interactive has followed with Chaos Island (£29.99), an adventure based on the film Jurassic Park and its sequel, The Lost World.

BBC Multimedia is using its TV formats with programmes like Live & Kicking and Blue Peter, both



Above DK's Eyewitness Children's Encyclopaedia is the best reference product for 7- to 11-year-olds
Right Go digital with Lego Island



now on CD-ROM. According to children, Blue Peter CD-ROM (£24.99) is "just like Blue Peter". Live & Kicking CD-ROM (£29.99) allows kids to make their own version of the popular Saturday morning show.

For younger children, Pingu CD-ROM (£24.99) from BBC Multimedia is enormously popular. The games are played for hours and teach mouse control to three-year-olds and upwards.

As well as films and TV, the big guns in the toy market have decided to harness the new processing power of computers. Mattel Media continues to add titles using its best-selling doll, Barbie, distributed by JM Interactive. The best of this year's programs is Barbie Magic Hairstyler (£39.99) in which you prepare her hair, make up and jewellery for outings like dream dates and fancy dress parties. What a life.

Lego, in association with Mindscape, has published Lego Island (£29.99), a great fun and addictive program which is quite different from building models with the real thing.

And Hasbro's Interactive division has launched a whole range of multimedia games including Monopoly Star Wars Edition (£39.99), Boggle (£19.99) and Trivial Pursuit (£19.99).

Debbie Davies



The nation's favourite TV programme goes interactive

PCW Details

- Anglia Multimedia 0171 579 4400
www.anglia.co.uk
- BBC Multimedia 01483 204450 www.beeb.com
- Broderbund 01784 486918 www.broderbund.com
- Disney Interactive 0181 222 1571
www.disney.com/DisneyInteractive
- Dorling Kindersley 0171 753 3488 www.dk.com
- Dreamworks Interactive 0345 710120
www.dreamworksgames.com
- Eaglemoss 0171 581 1371
- Fox Interactive 01753 549442
www.foxinteractive.com
- Hasbro Interactive 0181 569 1234
www.hasbro.com
- Iona 0181 296 9454 indigo.ie/~ionasoft
- JM Interactive 01703 650759
- Koch Media 01420 541 880 www.kochmedia.co.uk
- The Learning Company 0181 246 4013
www.learningco.com
- Microsoft 0345 710 120 www.microsoft.com
- Mindscape 01444 246 333 www.mindscape.com
- New Media 01491 413 999 www.new-media.co.uk
- Sunflowers +49 (0) 6104/98 15-0
www.sunflowers.de

Christmas Wishes: Gordon Laing



I love Christmas, and this year, instead of subjecting Hands On readers to my homemade Christmas card, I'll be raving about what's caught my eye in 1997.

None of your extraordinarily pricey stuff either: I'm going to pick out the affordable and keep the aspirational for another day. All the prices shown are approximate "off-the-ad-page" street quotes, including VAT.

■ Ever thought that files conspire to be larger than a floppy disk just to be awkward? Don't be beaten — buy an Iomega ZIP drive! At £105 for the drive and a tanner for each 100Mb removable disk, it's captured the heart of PC suppliers and users alike: nine million units shipped worldwide can't be wrong! I would really like a ZIP so that I wouldn't have to keep carting my own drive back and forth from work to home.

■ This year has seen the PC really score as a games platform. Pop in a 3D graphics card and you're gonna get a system which pans the dedicated consoles. Last month, ATI's Xpert@play was the Editor's Choice in our annual 3D graphics card group test, and it's a cracker. I guarantee it will put a smile on the face of any games player this Christmas. A bargain at £163, and you can even plug it into your telly when the Queen's speech comes on!

■ You'll need something to play, and 3D card or not, my favourite this year is International Rally Championships from Europress (see the review on p159). Those who value their sleep will not thank me for persuading them to part with its £45 asking price.

■ A good joystick, mouse or steering wheel is always a great gift, so check out page 164 for ideas.

■ If your PC is silent, you'll want to change that with a SoundBlaster from Creative Labs. I could recommend several other manufacturers, but Creative's cards are the easiest to install — the last thing you'll want to make at Christmas is a technical support call.

■ If you're into making your own music or just want the best sound for games, I'd go for the top-of-the-range AWE64 Gold at £125. Some decent magnetically-shielded speakers are always



welcome too, so try something from Yamaha's range.

■ A great stocking filler for the music lover is a MIDI keyboard, which plugs into almost any sound card and provides great "sing-along-a..."

Sea here: NEC's 14.1in MultiSync LCD400 monitor is a real cracker



Driving the deserts of Egypt with International Rally Championship

opportunities when the Christmas dinner has been devoured. Evolution offers several models starting from £35.

■ Those who want to make dance music should check out the Sound Engine Plus bundle from Time+Space. Consisting of Circle Elements, Steinberg Cubasis Audio Lite and SoundLab FunTools, this £39.95 package will get even

Evolution's Music Creator Pro MIDI keyboard

Granny grooving.

■ There's nothing like having a laugh at the relatives, and if you can't do it at Christmas, when can you? Kai's Power Goo will have everyone in stitches for only £46, while those wanting to more sensibly remove red-eye or turn their photos into cards and calendars should go for the excellent Adobe PhotoDeluxe II at £58.

■ What do you mean, you haven't got any family photos in your PC? Budget flatbed fans need look no further than the £200 Agfa SnapScan 310 to do the job.

■ Digital cameras are undeniably sexy gadgets, if not a little pricey. But I must admit to falling for Sony's gorgeous DSC-F1 and Kodak's impressive DC210, at £465 and £750 respectively.

■ If Santa's pit were bottomless, I would just love a thin, flat-screen monitor. In our October issue roundup, NEC's 14.1in LCD400 stood out from the rest; a snip at around £2,000.

■ I would pursue my film career with a Sony digital camcorder, connected to my PC

with a 1394 FireWire interface. Oh, and a Sony widescreen rear-projection TV, complete DTS surround-sound system, fast car...

[Okay, Gordon, that's enough. Your mum says that giving is better than receiving. Ed.]

Gordon



PCW Contacts

Adobe Direct 0131 458 6842 www.adobe.co.uk
 Agfa 0181 231 4200 www.agfa.co.uk
 ATI 01628 533115 www.atitech.com
 Creative Labs 01245 265265 www.creat.com
 Europress 01625 859333 www.europress.co.uk
 Evolution 01525 372621 www.evolution.co.uk
 Iomega 0000 466342 www.iomega.com
 Kodak 0800 281487 www.kodak.com
 Kai's Power Goo from Principal Distribution
 01756 704000 www.metatools.com
 NEC 0645 404020 www.nec.com
 Sony 0990 424424 www.sony-cp.com
 Time+Space 01837 841100 www.timespace.com
 Yamaha 01908 366700 www.yamaha.co.uk

Christmas Wishes: Dylan Armbrust

Like some of my colleagues, I'd start my Christmas list with the most essential ingredient: a new PC. I have an old Pentium 75 at home which I have converted into a respectable Pentium 125 with the help of a handy and dandy Intel Overdrive chip. But the times they are a-changin' and it's about time to move up the ladder. I have been a good boy this year, so I would like to count on Father Christmas's generosity and technical nous and find the current PC of my dreams under the tree on Christmas morning.

■ What I would really like is an AMD K6 233-based PC with all the trimmings. Naturally I want the best, but I wouldn't push Father Christmas too hard knowing that even he probably has a budget to worry about. I would settle for a respectably-sized hard drive, mid-speed CD-ROM drive and a solid 15in monitor.

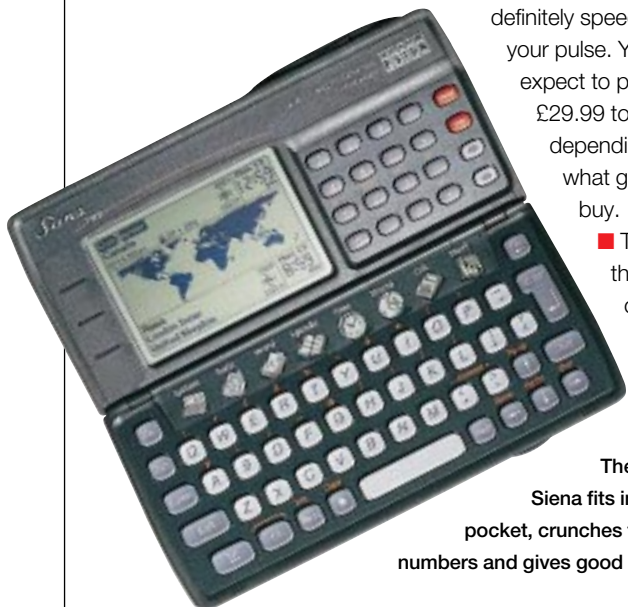
■ But being an avid games-lover who likes fast graphics and game speed I would try to get him to throw in a top 3D graphics card. The all-purpose ATI Xpert@play with 4Mb of SGRAM would do the trick nicely. It handles all manner of graphics, from fast 2D applications to complex 3D game graphics. But if its asking price of £163 were not possible, I'd settle for an affordable 2D graphics card such as Hercules' Stingray 64 video (only £46) and later buy the Orchid Righteous 3D add-in card. The Righteous 3D is now selling for about £116 on the street and it gives top performance and graphics.

■ To make the most of my new kit I'd want to play my favourite games of the year on it. Games are perfect stocking fillers and I'd trade oranges, chocolate and nuts for these any day. Top of my list is Red Alert: Command and Conquer. This game is not only fun, but it makes you think too. And the great part is that you don't need to be younger than 15 to enjoy it. There's also Microsoft's Flight Simulator 98, which has more flying fun than any of the previous versions and it will even let you try your hand at flying a helicopter. On the shoot-em-up side I'd have to go with the old standby, Quake, and MDK which is a new addition to my top ten favourites. The graphics are outstanding, the gameplay is intense and the background music will most

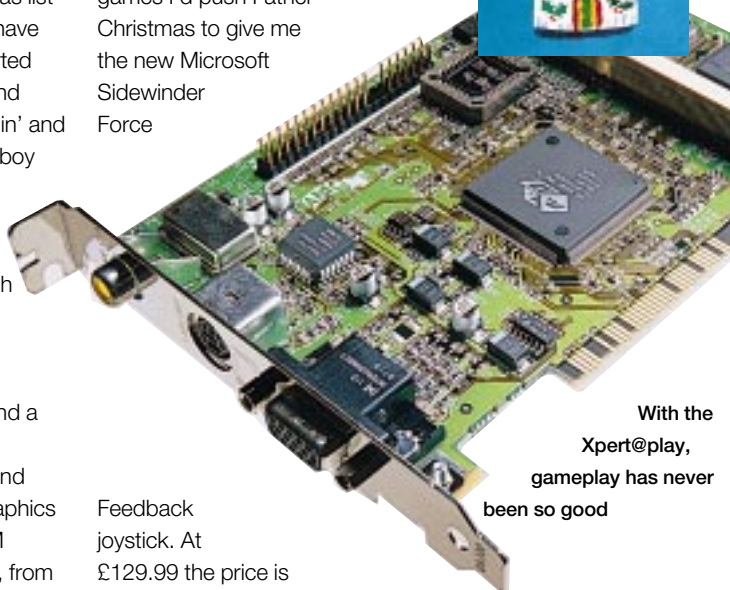
definitely speed up your pulse. You can expect to pay from £29.99 to £49.99 depending on what game you buy.

■ To make the most of these new

The trusty Siena fits in your pocket, crunches those numbers and gives good Solitaire



games I'd push Father Christmas to give me the new Microsoft Sidewinder Force



With the Xpert@play, gameplay has never been so good

Feedback joystick. At £129.99 the price is a bit steep, but if you want engrossing gameplay where you feel the recoil of a plasma gun or the nosedive of your helicopter, then this peripheral is a must.

■ But life isn't all fun and games, so there are a few software applications I think I'd like to unwrap this year. The first would be Microsoft's Money 98 (Standard Edition). If you're like me, then you'll want to have the ability to track just how much money you've spent on those hazy Friday nights out. Or if you happen to be saving up for that new house, you'll find the savings and investment tools invaluable. And if you're with the right bank, it will even let you perform online banking to transfer funds, pay bills and check your statements. At £29.99 it's a great bargain.

■ There's also Microsoft's NetMeeting 2.0 internet communications software. If you and your long-distance friends and family are online, this can help to keep you in touch and all for the cost of a local phone call. The best part of NetMeeting is that it's free. It comes bundled with Windows 95 or, if you don't have that, you can download it from Microsoft's web site. And, with my monthly phone bill, this present from Father Christmas couldn't come too soon.

■ Finally, I'd like to unwrap a Psion Siena with 512Kb of memory. I know there's a new Psion 5 with a fancy new keyboard and lots of memory, but I really don't need all that computing power when I'm on the move.

As long as I can record phone numbers, track my expenses and play Solitaire on the train, I'm happy. And, at £129, it doesn't seem unreasonable.

Dylan

PCW Contacts

ATI Technologies 01628 533 115 www.atitech.com
 Command and Conquer: Red Alert from Virgin 0171 368 2255 www.virgin.com
 Hercules from Imago Micro 01635 294300 www.imagomicro.co.uk
 MDK from Interplay Productions 01628 423666 www.interplay.com
 Microsoft 0345 002000 www.microsoft.com
 Orchid 012356 479898 www.orchid.com
 Psion 0990 143050 www.pSION.com
 Quake from GT Interactive 0171 258 3791 www.gtinteractive.com or www.idsoftware.com

Christmas Wishes: Adele Dyer

Maybe I'm just greedy, but thinking about what I want for Christmas has made me realise that it's not so much a stocking I need to hang up for Santa, than a duvet cover.

■ First on my wishlist is a faster PC. I currently have a P150 at home and a K6 200MMX in the office; not a bad setup, I know, but to run one of the packages on my Christmas wishlist I need at least a P150MMX at home. Ideally I would go for a PII with a *huge* hard disk and loads of RAM, but as greed is one of the seven deadly sins and not likely to endear me to FC, I suppose I had better just ask for an Intel Overdrive chip instead. All I need to do is change the jumper settings on my motherboard to make it run at 66MHz and I could fit a 200MMX for just £187, which is a lot less than the cost of a new machine.

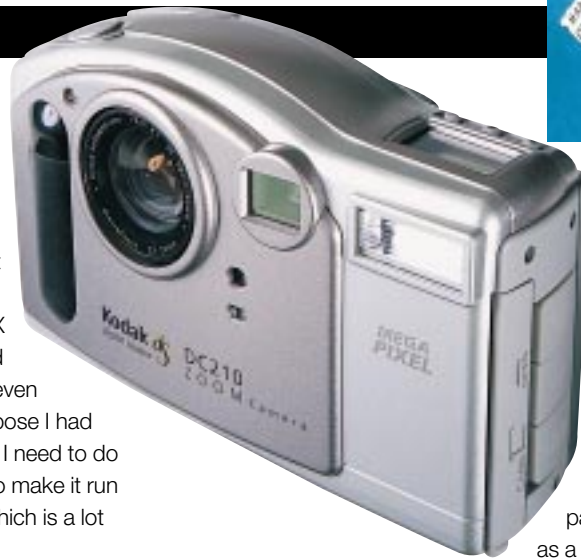
■ But what *is* the power-hungry package? IBM's ViaVoice, a continuous speech recognition system which works extremely well and costs a bargain £99. It is perfect for anyone who spends hours slaving away over a hot keyboard, even if they are a good typist. It takes the strain out of writing long reports, and as you can dictate directly into Word and record macros and add words to the vocabulary, it's easy to use and remarkably versatile.

■ Staying with the more expensive wishes for a moment, I need a good printer at home. Ideally, I would like an Alps MD-2300 Masterpiece, simply because it is the most versatile printer we have seen at PCW. It uses Micro-Dry technology, which is rather like dye-sublimation in the way it puts the ink onto the paper. As a result, it is very good at printing photos on glossy sheets of A4 paper in a way that is closer to continuous tone than any other printer we've seen, with the exception of those that cost silly money. It can also be used to print text and colour graphics, as well as printing on the usual range of mad media like iron-on transfers and greeting cards.



As the MD-2300 costs £700, maybe this is pushing things a little bit too far? So instead I would like a QMS DeskLaser 600 for my letters (a bargain at just £235) and the ColourGraph PixPrint, a tiny dye-sub, for my photos.

■ Which leads me on to all my other imaging needs. I would kill for a Kodak DC210, a digital camera with a resolution of 1,160 x 864 pixels and better quality than we have ever seen from a digital camera. It is still a bit expensive at £750, but if you want to avoid the added expense of the scanner, it is probably a good price. To go with this I would like Adobe PhotoDeluxe 2, which is



The Kodak DC210: Probably the best digital camera for less than £1,000

a significant improvement on the already excellent first version. And at £58 I've found a package that qualifies as a stocking filler!

■ Of course, if you are seriously into image manipulation and drawing, you will probably want a graphics tablet. If this sounds like a trip from the sublime to the ridiculous in terms of expense, then consider the Wacom PenPartner. It is a little A5 graphics tablet that is bundled with a pressure-sensitive pen so you can draw as you would with ordinary drawing tools, and it comes bundled with versions of Dabbler and Kai's Soap — both are excellent



Above Doodler's delight: the Wacom PenPartner

Left The tiny PixPrint dye-sub printer is perfect for printing your photos

programs in their own right. And this splendid little package comes priced at just under £85, which is a real bargain and makes

the PenPartner a sure-fire hit for anyone.

■ I'd ask for a new modem, as the 28.8Kbps I use at home does seem very slow at times, but the last thing I need right now is a 56K modem. Not only are the powers that be (the ITU) still trying to separate the warring factions (3Com and US Robotics vs the rest of the Lucent/Rockwell-using world) but the modems themselves are not all they are cracked up to be, being only slightly faster than 33.6Kbps models. So please, should my Fairy Godmother be listening, can she hurry up and make ADSL a reality, soon?

Adele

PCW Contacts

- Adobe Direct 0131 458 6842 www.adobe.co.uk
- Colourgraph 01734 819435 www.colourgraph.co.uk
- IBM 01705 492249 www.software.ibm.com
- Intel 01793 403000 www.intel.com
- Kodak 0800 281487 www.kodak.com
- QMS 01784 442255 www.qms.com
- Wacom from Computers Unlimited 0181 358 5857 www.wacom.de

Christmas Wishes: Clive Akass

A portable digital camera nearly made it to my Christmas wishlist, but this does not seem to be a good time to buy one unless you have a pressing need for instant electronic images. For the price of a halfway decent one you could buy a far more versatile single-lens reflex, plus a colour scanner to digitise the images.

■ I have a film camera already, so I'd be happy to get a Visioneer PaperPort Strobe document scanner (£175). This copes well with text and colour pictures, and fits between your keyboard and system box. The accompanying document management software functions equally well as a photo album. Also bundled is image manipulation and OCR (text-recognition) software, plus easy integration with other relevant programs you have installed.

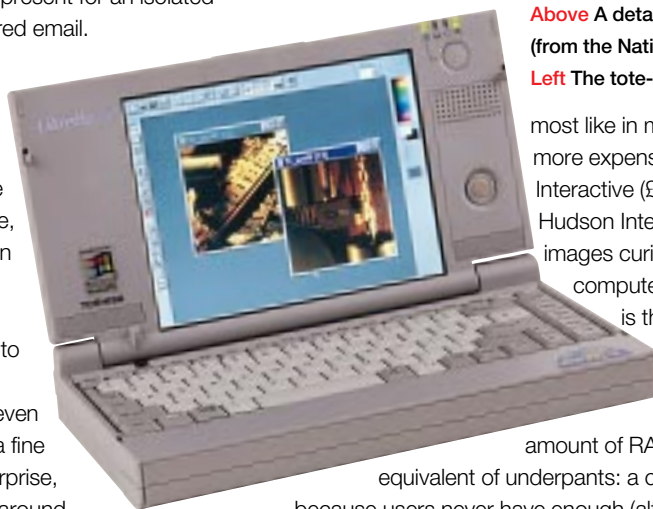
■ I'd like a desktop camera too, linked permanently to my PC, partly because I have a devious plan to grab myself a picture of any thief who dares come near it. You can pick one up for less than £100 (a camera, that is, not a thief) that would make a good present for, say, parents wanting to keep in visual touch with their children. Intel's Create and Share package [see review, page 83] bundles a camera, with video-phone and image-manipulation software, for £176. For video-phonng you'd also need a web connection, itself a good present for an isolated friend or relative who has not discovered email.

■ Santa will doubtless bring many people a pocket organiser. I confess to a prejudice in favour of Psion here, simply because it is British. Why buy Windows CE machines when they are no better, and in many respects worse, unless you want to give Bill Gates even more money? (A new crop of CE 2.0 machines will have been launched by the time you read this but are unlikely to be available here before Christmas.)

A Psion Series 5.0 (from £390) or even a 3c (around £100 less) would make a fine present. My wife, somewhat to my surprise, has taken to the smaller Psion Siena (around £213) to the extent that her life is now ruled by it. It has the same organiser features as the 3c, including PC connectivity via PsiWin (which costs extra), although its keyboard is nowhere near as good. But for light personal use I would actually prefer it, as it is both literally and figuratively easier on the pocket.

■ If you must buy American, look at the Palm Pilot (from £183 with PC interface), the first organiser to have a usable handwriting interface. Much cheaper and much more limited is IDT's PC Pal, which sells in high-street stores for a recommended £29.99. It has only 7Kb of memory, but it will download appointments and numbers from your PC by reading bar codes flashed on the screen.

■ Around this price are CD-ROMs. The problem with buying these is that so many do not pass the book test (would this CD be better bought in printed form at half the price?) and you can't tell until you try them out. But art CDs rarely fail the test because no book allows you to zoom in on pictures. Sadly, the ones I'd



Above A detail of Van Gogh's Chair (from the National Gallery catalogue)

Left The tote-able Toshiba Libretto

most like in my stocking are among the more expensive. One is Escher Interactive (£58.75 from Thames and Hudson Interactive) with its surreal images curiously anticipating many computer-graphics effects. Another is the newly updated National Gallery catalogue (£64).

■ For that kind of price you can pick up a tidy amount of RAM, which is the computing equivalent of underpants: a can't-go-wrong present, because users never have enough (although be sure to buy the kind and capacity to suit the recipient!).

■ As a luxury, I'd like a Toshiba Libretto (£1,475), which is about the closest a notebook has got to being truly portable.

■ And for sheer indulgence, I still have a hankering for a Roland GI-10 MIDI interface (£441, or £577 with compatible pickup), which allows a guitar or a voice to control a MIDI sound module; imagine singing like a thousand violins! At least, I believe this is what it does. The only time I got close to trying one out, it got stolen before it reached my desk. I wonder if Santa has video-surveillance on his sleigh?

Clive

PCW Contacts

IDT 0162 8826688
 National Gallery Publications 0171 839 8544
 Palm Pilot from 3Com 01734 228020
www.3com.com/palm
 Psion 0171 258 7368 www.pSION.co.uk
 Roland 017092 515020 www.roland.co.uk
 Thames and Hudson Interactive 0171 636 5488
 Toshiba 01932 828828 www.toshiba.com
 Visioneer 0800 973245 www.visioneer.com

Christmas Wishes: Adam Evans

The scene: A busy department store on the last Saturday before Christmas. Having queued for hours, a pretty young child approaches the plump red-suited figure slumped in his chair...

Santa: Ho, ho. Wellm little girl, what do you want for Christmas?

Mary: Yeah, wotcha Santa. Oh, you know, the usual stuff: dolls, toys, world peace, nothing very exciting... But there is *one* thing I'd like more than anything — I'm desperate for some advice.

Santa: I'm afraid Santa doesn't know much about personal problems, young lady — except for Red Nose Complex, of course. Whoever heard of an Agony Santa?

Mary: I'll do the jokes, fatso. The thing is, every single member of my family is really into computers and I've got no idea what to get them. I've got a few quid 'cos I won the "precocious under-fours" sweepstake at my nursery school... But I don't suppose you know much about computers, either?

Santa: Well, normally you'd be right, but if you could see

beneath this beard, you might just recognise the Technical Editor of a well-known computer magazine. The hours are bad on PCW and the pay is lousy, so these little weekend jobs help me keep the wolf from the door. Ask away, but please promise not to tell anyone about my moonlighting.

Mary: No worries, mate. First up are my ma and pa: they're really keen on keeping a scrapbook of my life on PC. My mum wants to load-in old photos, and dictates so much narrative to my dad every day that his wrists are beginning to creak.

Santa: Your father could do with a rest — a wrist rest, to be exact. They're available from virtually any supplier of computer equipment and cost around a fiver. I swear by mine. As for your mother, get her a Colour Visioneer PaperPort scanner. It's compact, quick and simple to use, and good value at £175.

Mary: Sounds good so far. Now what about my brother, Joe? He's always complaining that Windows 95 doesn't run properly on his 133MHz Pentium with 16Mb of RAM.

Santa: That's easy. Buy him an extra 16Mb RAM (around £40) — look at the advertisements in the back of PCW and watch that system fly. He'll thank you forever — or at least until Windows 98 comes out, which could be about the same timescale.

Mary: Okay, ta. My old granny's really into music and bought a CD recorder to preserve her ambient hip-hop techno creations. She'd also like to transfer her old gramophone records to CD but it's all too complicated for her.

Santa: Adaptec Easy CD Creator Deluxe (£81) is the first software to take the mystery out of recording CDs. It's simple to

use and does everything you could want.

Mary: My grandad runs several small companies from his garden shed but their stock prices are suffering because he's so disorganised. What he needs is somewhere he can put all his contacts, thoughts and little fiddly bits of information.

Santa: The answer to his problems is my most favourite utility: 3M Post-It Software Notes (£24). You can enter

all kinds of information into the on-screen Post-It Notes, set alarms on them and do lightning-quick searches. It's almost perfect, but do remind him to back up the data now and again.

Mary: Finally, I thought I'd buy some games for my cousins. Any ideas?

Santa: There are a few that stand out from the crowd, which cost between £25 and £35. Doom-style adventure freaks will go crazy over Outlaws, with the best soundtrack I've heard. Strategy nuts will love Red Alert and Dark Colony, but for sheer fun and hilarious graphics you'd have to go a long way to beat Neverhood.

Mary: Thanks for your help, Santa, you've given me lots of ideas. And don't worry, you can trust me to keep *schtum* about your moonlighting, although a Pentium II system at the bottom of my bed on Christmas morning wouldn't be a bad idea... *know what I mean???*

Santa: Huh! And a merry Christmas to you, too.

Adam

Top, right Visioneer PaperPort Strobe scanner
Middle Adaptec Easy CD Creator: CD recording software we can all understand
Above Neverhood: Brain-bending puzzle situations with "plasticine" people



PCW Contacts

3M 01344 858876 www.3m.com
 Adaptec 01276 854500 www.adaptec.com
 Dark Colony from Take 2; 01753 854444
www.darkcolony.com
 Neverhood from Microsoft 0345 002000
www.neverhood.com
 Outlaws from Virgin Interactive 0171 368 2255
www.lucasarts.com
 Red Alert from Virgin Interactive 0171 368 2255
www.westwood.com
 Visioneer 0181 730 0488 www.visioneer.com
 Wrist rest & memory See advertisements in this issue



Thinking **big**

Mobile computing is about big ideas with small results, and Psion's palmtops are a strong barrier to the Windows CE bid for the market. Designer Martin Riddiford talked to Clive Akass about computing on-the-move and future developments.

Of all forms of computer, mobiles are perhaps the most open to innovation. They have not yet locked-in to particular technologies as did PCs with Intel processors and Microsoft software. Moreover, now that the web and Java have raised the flag of platform independence, there is no need for them to do so. Nevertheless, Microsoft is trying to corner the mobile market with its miniature Windows CE operating system, but for once, some of its most potent opposition is

British: palmtop specialist Psion, with its new Epos 32 operating system, and Acorn with its RISC OS.

Fascinating as this technological competition is, some of the most interesting problems are ergonomic. The question is: how small can you make a practical computer for personal use? As size is dictated partly by the means of input, this raises another question: how best can a human communicate with a computer?

Martin Riddiford has been grappling with such

Main picture: NICK DAWE

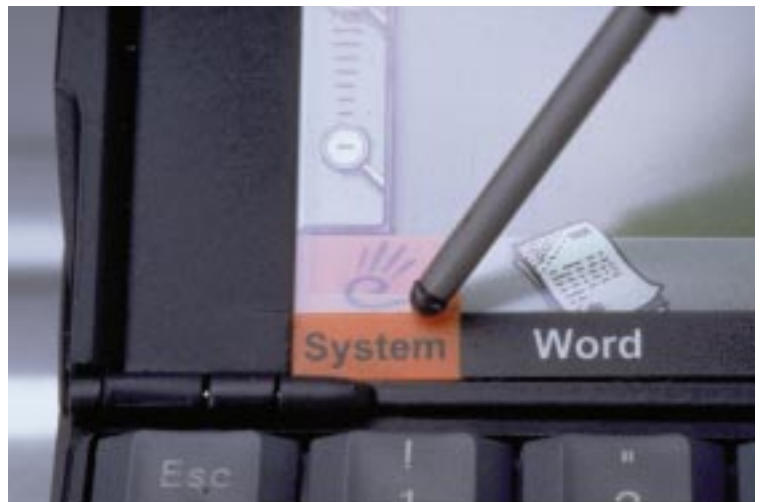


problems for more than a decade, since the design shop where he was working got the commission for Psion's early Organiser: the rectangular one with a two-line display and calculator-like non-qwerty keyboard. He designed the classic Psion Series 3, which had the best palmtop keyboard in the world, and he designed the new Series 5, which has an even better keyboard.

Some people regard the Series 5 as adequate for heavy-duty typing, which cannot be said of any other palmtop at the time of writing (new CE models, some certainly influenced by the Series 5, will have been launched at the Comdex exhibition by the time you read this). My own preference would be for a larger keyboard, even at the expense of having a machine that has to be carried in a bag rather than a pocket.

Riddiford agrees, somewhat to my surprise, but points out that his brief was for a smaller design with advantages of its own. "It's great to have a portable machine that fits in your pocket — that's really what defines the size..." he holds out a Series 5 prototype "...and I can hold this in one hand and use it. As soon as you put in a full-size keyboard, you can't do that."

Riddiford started his own company, called Therefore, four years ago after discussions with Psion founder, David Potter. "We thought it would be a good idea to set up a design practice which was part-owned by Psion and have a key competence in miniature electronics. We started off with four people and Psion was 100 percent of our business. Now we have 22 people and Psion represents about 30 percent." Models of an Action Man hang-glider and helicopter at his studio off London's



Baker Street are evidence of diversification.

Riddiford hit on the Series 5's characteristic fold-out keyboard as a way of combining the largest possible size with a firmly anchored touch-screen that would not wobble when used. Riddiford drew up and patented a novel design for the keys, which press down on the switching matrix. First prototypes used a conventional matrix consisting of two membranes, one each for the rows and columns. Finally, Riddiford plumped for a single membrane with printed columns and rows separated by a layer of insulation. "Obviously we had to test that this was going to last for tens of thousands of flexes."

The same meticulous attention went into the Series 5's stylus, which is designed to be held back from the tip to keep the hand from obscuring the screen and nudging

The Series 5 has the best palmtop keyboard in the world (top), with a stylus made from a single piece of plastic, injection-moulded into a metal sleeve and held away from the tip so as not to obscure the screen (below).

Main pic
Martin Riddiford

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The process of design

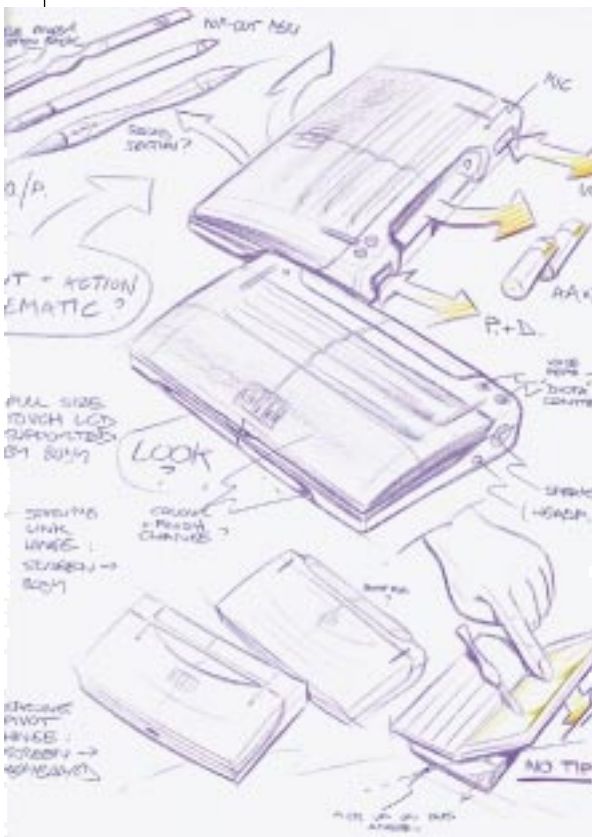
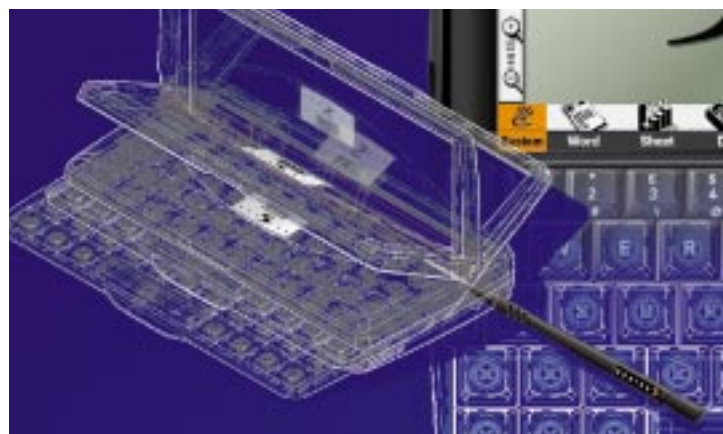
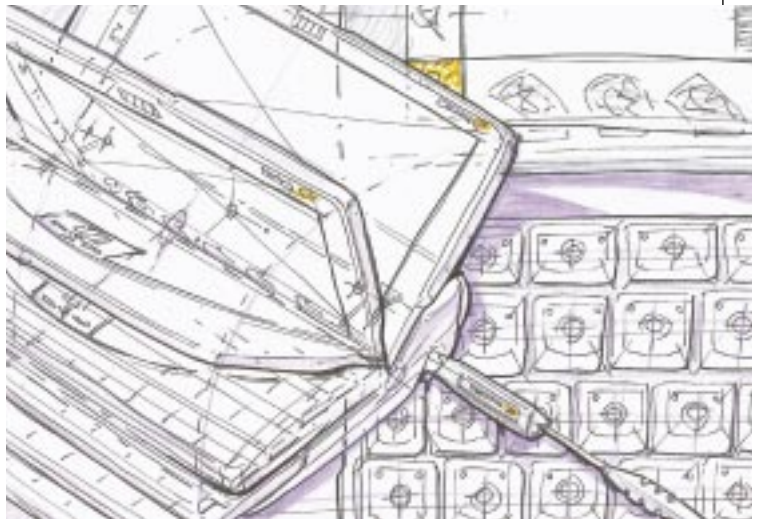
Computers have yet to beat the proverbial back of the fag packet and Riddiford still does preliminary sketching by hand (see below). Ideas are drawn up formally, using Pro/Engineer on Silicon Graphics Indigo machines, although Therefore is trying out the NT version. When photorealism is required, drawings are worked up on Macs using Adobe Illustrator and Photoshop.

Some prototypes can be made up in-house, but some are sent to specialists such as Gloucester-based Formation to be made up by a wonderful process called Stereo Lithography.

Programs like Pro/Engineer can output drawings as an STL (StereoLithography) file, which represents a 3D object as a series of 2D slices. The data is fed to a StereoLithography Apparatus (pictured, top right) at the heart of which is a laser-scanned resin bath. A platen, for holding the object under construction, lies just under the resin surface.

The laser solidifies any part of the surface that it scans, so the object can be built up layer by layer as the platen repeatedly sinks the depth of a slice. In practice, some kind of support structure for the object has also to be created, and each layer is carefully re-coated to ensure an even thickness.

■ Formation 01452 380336 www.formation.co.uk



“The big question is whether Psion can keep its nerve and run with its own software, rather than taking the Gates shilling and producing a CE machine”



Top The Series 5 stylus compared with other designs
Middle The spring assembly for the lid
Bottom Case closed

the keyboard. The Series 5 screen looks normal enough but is as unconventional a design as the keyboard. Most touch-screens have a digitiser membrane glued to a liquid-crystal display, the whole expensive assembly of which needs replacing if damaged. And palmtop screens are vulnerable to damage. Riddiford sourced the screen and the membrane from separate suppliers and found a way of clamping them together so that a layer could be replaced if necessary.

What does he think of going the way of the PalmPilot, which is driven by recognition of simplified handwriting, and doing away with the keyboard altogether? “It’s easy to get excited about other forms of interface, but at the end of the day they’d have to be virtually 99.9 percent reliable,” he says. “If you are used to a keyboard, you know that if you hit the right key the [letter you require] is going to be on-screen.”

It seems clear that although some machines will certainly be speech-driven, speech is not about to supersede manual input any more than telephones superseded letters. My own hunch, I tell Riddiford, is that sooner or later we will invent a new gesture language, only remotely related to handwriting, to talk to machines.

He has clearly thought long and hard about the issue and comes up with an idea that has been knocked about before, here at PCW. “No-one has based handwriting recognition on shorthand,” he says. “You can take down whole phrases that way...it’s not just letters. The goalposts are moving all the time... My kids are learning keyboards but by the time they leave school, perhaps they won’t *have* keyboards.

“The way these things tend to work, you end up with a proliferation of different ways of doing things and one of them may start taking over. But the others are not going to disappear overnight. Look at the ways of controlling interfaces on computers...controlling the menus and things like that. There are at least half a dozen ways of doing it. The mouse is predominant on larger machines but it is not suitable for notebooks. And then there is the touch-screen: it’s good for some things but you are always obscuring what you are doing.”

Psion’s Epoc 32 offers an astonishing array of features you would expect only in an inflated operating system like Windows 95. They include OLE-style embedded objects: a working spreadsheet or a freehand drawing within a word-processor document, for instance.

Riddiford became involved in the design of the software interface, with its symbols and icons, and was interested in the way that a toolbox could transform the pen into anything from an eraser to a tool for changing capitals into lower case. On the face of it, such features put Epoc 32 way ahead of Windows CE, which does not (as many believe) run Windows applications. CE’s sole advantages are the Windows 95 look-and-feel and Microsoft’s clout, but better technology has never been a guarantee of better sales.

The big question is whether Psion can keep its nerve and run with its own software, rather than taking the Gates shilling and producing a CE machine. And whether it will bring out a larger version of the Series 5, and/or a smaller palmtop driven by speech or pen.

If Riddiford knows the answers, he isn’t saying. “Wait and see,” he says, tapping his nose. ■



King of England

Claimed to be the British equivalent of Stephen King, Peter James is a talented novelist, scriptwriter and businessman. Michael Hewitt enters his haunted home to catch up with the avid reader who believes the written word is dead.

Bestselling author, Peter James, lives in a haunted 18th century Georgian manor house in Sussex. He's not sure whether he's got three ghosts, or four. They tend to come in and out as they please, rather like ethereal B&Bers, so keeping track of them can be difficult. When I first turned up, I thought I might be in line for an introduction. There were mysterious blue flashes coming from one of the downstairs rooms, and the house lights kept flickering on and off. Very Hammer Horror. It turned out, however, to be nothing more supernatural than the PCW photographer: his flash-gun was fusing the household electrics.

Peter James, 1948 vintage, is often referred to as the UK's Stephen King. He looks more like an older, wiser Ben Elton. Educated at Charterhouse, and then Ravensbourne Film School, he moved to Canada in 1970 to work as a television writer. This soon led to work in films and the establishment of a film production company, Quadrant Films, responsible for such *œuvres* as *Dead of Night*, *Malachi's Cove*, *Spanish Fly*, and *I Dismembered Mama*. In 1980 he wanted a change.

"I found that film production was invariably creation by committee, restricted by budgetary constraints. For example, the script might dictate that a character died in a plane crash. But the money men would say: 'No, we haven't got the finances for that — he'll have to fall off a bike instead'. So, inevitably, I got frustrated. Hence my move to novel-writing. Here, I can work out my own ideas, on my own. I'm in total control."

Since 1980, except for a 1985-87 hiatus, Peter James has averaged about one novel a year, covering themes like medicine, science, computing and the paranormal. Many, including *Possession*, *Prophecy*, *Host*, and *The Alchemist*, have become bestsellers. And, as is the way with bestsellers, many have been, or are being, adapted for film and television. In between times he helped found Pavilion Internet in 1994, is currently developing a half-hour sitcom series, called *Getting a Life*, for Yorkshire Television, is working on a one-hour drama programme, *.ORG*, about policing the internet, and is launching a new film and television development company, Ministry of Vision. He regularly courts controversy among the literary establishment by suggesting that the paper-based book as we know it is dead, and that the future of reading

belongs to the written word migrating to an electronic display medium. He's just released his new book, *The Truth*, published by Orion, about a man who owns a multimedia company and his wife entering a surrogate baby contract to bail themselves out of bankruptcy. Only after the event do they realise the horrific consequences [reviewed this month, page 336]. Curiously, Peter James finds time to eat and sleep. How?

"As they say, if you want something done, give the job to someone who's busy. In the good old days, when I just wrote one book a year, I didn't seem to have the time to do anything else. But this year, I've written two books and two pilot scripts for television, yet I'm not consciously working any harder." Perhaps the secret lies in the way he organises himself. He has a strict routine. The alarm goes at 6.30am. He then jogs, feeds the ducks, and comes back for breakfast and the morning papers. These he speed reads ("I learnt this technique years ago. It teaches you to read 2,000 words a minute. It's no good for novels, but it allows you pick the bones out of newspaper articles and reference material.") Having inwardly digested, he gets to his desk for 8.45am, turns on his Mac and begins writing. This takes him through to 1.30pm, when he breaks for a light lunch. This is followed either by a walk with the dog, Bertie, or a game of tennis (presumably not with Bertie). From 4pm to 9pm he's back writing. He breaks for supper and watches "something mindless" on television. At 11pm, he returns to his Mac for a final hour. Bedtime is at or around midnight. Betwixt waking and sleeping, he aims to write a minimum of 1,000 publishable words, which means producing 1,400 to 1,600 of the semi-publishable variety and pruning down until it's right.

Why, I asked him, with such a workload, does he insist on including his email address at the front of all his books? Isn't this simply asking to be inundated with fan and/or hate mail? "Often I am, although not as badly as someone like Terry Pratchett who, apparently, produces the equivalent of one whole novel a year just in replying to his fans. But I like the immediacy of email communication and the fact that it gives me instant response from my readers. Yes, it can get a little crazy at times, of course, especially when people ask me to go into detail and explain, say, characters or plot development. But I do try to respond to everyone. Sometimes, they can be very



PHOTOGRAPH by Nick Dawe

helpful in return. They'll mail me to say: 'If you're ever researching in such and such an area, and you ever want any help, please drop me a line.' So I'm able to do a lot of my research thanks to these initial contacts."

Indeed, the internet as a whole has largely taken over as his primary research tool. He calls it "A writer's greatest secret resource," which is "...as important to us as Gutenberg was to his time." As far as Peter James is concerned, it has rendered conventional reference books redundant. The only one he still uses is a dictionary. But doesn't the high percentage of garbage on the net make research something of a needle hunt in a large haystack?

"I agree, the crap ratio is very high. However, you go into any bookstore or library and you'll probably find that 80 percent of it is of no interest to you. The same with the net. But the internet does have advantages over printed reference sources. If I go into a library to do research, I find that the material is at least six months to a year old.

On the internet, it's updated daily. So, yes, while there is dross on there, you've also got this tremendous immediacy. Coupled with that is the interactivity aspect, which you'd never get from any other form of reference material. When I was writing *The Alchemist*, a book about a sinister drugs company, I went into newsgroups asking if anyone had any horror stories about the pharmaceutical industry. I hit a very rich seam. I got one man who said, I can't tell you my name, but I'll meet you for lunch at such and such a restaurant. The guy was a nervous wreck. It turned out that he used to work for one of the world's largest pharmaceutical giants and had been hounded out when he'd blown the whistle on some of their unsavoury business practices. He proved to be an excellent source of material."

It was this enthusiasm for the internet that led Peter James to co-found Pavilion Internet, one of the UK's first service providers, in 1994. Surprisingly, he received a

Horror story:
Peter James has been the cause of much anguish in literary circles because of his belief in the end of the book as we know it. He has been accused of destroying the nation's reading habits

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“I envisage a sort of smart book. It will be a piece of plastic or flexible silicon that’s as nice to read as a sheet of paper, that can be read in the bathtub or in direct sunlight”

hostile response from certain quarters; mostly university students and academics who didn’t seem to like the idea of the general riff-raff joining them.

“Back then, the internet was still largely the province of techies who thought it shouldn’t be used for commercial purposes. They seemed to believe it was their private playground. I received quite a lot of hate email from people saying ‘How dare you exploit the internet’ and so forth. And there were some amazingly hostile comments in the newsgroups.”

He provoked similar hostility when he decided “on a whim”, to publish a floppy-disk edition of his bestselling thriller, *Host* — a book about cryogenics and artificial intelligence — concurrently with the paperback version. The disk contained the book’s text, with hyperlinks to underlying notes (“Having the extra annotation meant I didn’t have to junk all the interesting research that wasn’t used in the novel.”). The literati reacted as though he’d brought out a scratch-n-sniff edition of the OED.

“I was amazed at the amount of vitriol I was getting. ‘You’re causing the death of the British novel, old boy,’ said one. The Society of Authors accused me of destroying the nation’s reading habits. But this is nonsense. As far as I’m concerned, unless reading moves with technology, it will die out. Look what’s happening with schoolchildren. There was a recent survey of 12- to 16-year-old boys which established that they’re not reading any more. Why? Because they say it’s a hassle. That books are boring. So something has got to be done to make them regard books as “cool”.

“For me, reading is one of the most wonderful things anyone can do in their life. Reading books was the way I discovered that other people had the same thoughts about life as me, the same hangups, the same hassles with their parents and the same sexual anxieties. I got my entry into the world through reading. It’s a private, personal thing which cannot be allowed to be completely supplanted by other media like films, TV, and video games.”

In order that it isn’t, he feels it’s imperative that the book should adapt. “What is so sacrosanct about reading from a page of printed paper, a technology that hasn’t changed in hundreds of years? Why can’t we change over to read from a computer screen? I’m not suggesting a VDU monitor. I envisage a sort of smart book. It will be a piece of plastic, or flexible silicon, that’s as nice to read as a sheet of paper, that can be read in the bathtub or in direct sunlight. And, like paper, you’ll be able to fold it up and put it in your pocket. It will cost next to nothing and will probably run off your body’s energy, like a kinetic watch. But unlike, say, a 600-word paper-based book, you won’t stick it on a shelf once you’ve finished it. You’ll simply point it at a telephone jack and download a new book on to its screen. And you’ll be able to choose whatever font you want to read it in, whether you have pictures, and so forth. You won’t be dictated to

by the publisher on this. If, for example, you want pages of 14-point, double-spaced text with colour illustrations every other page, you can have them.”

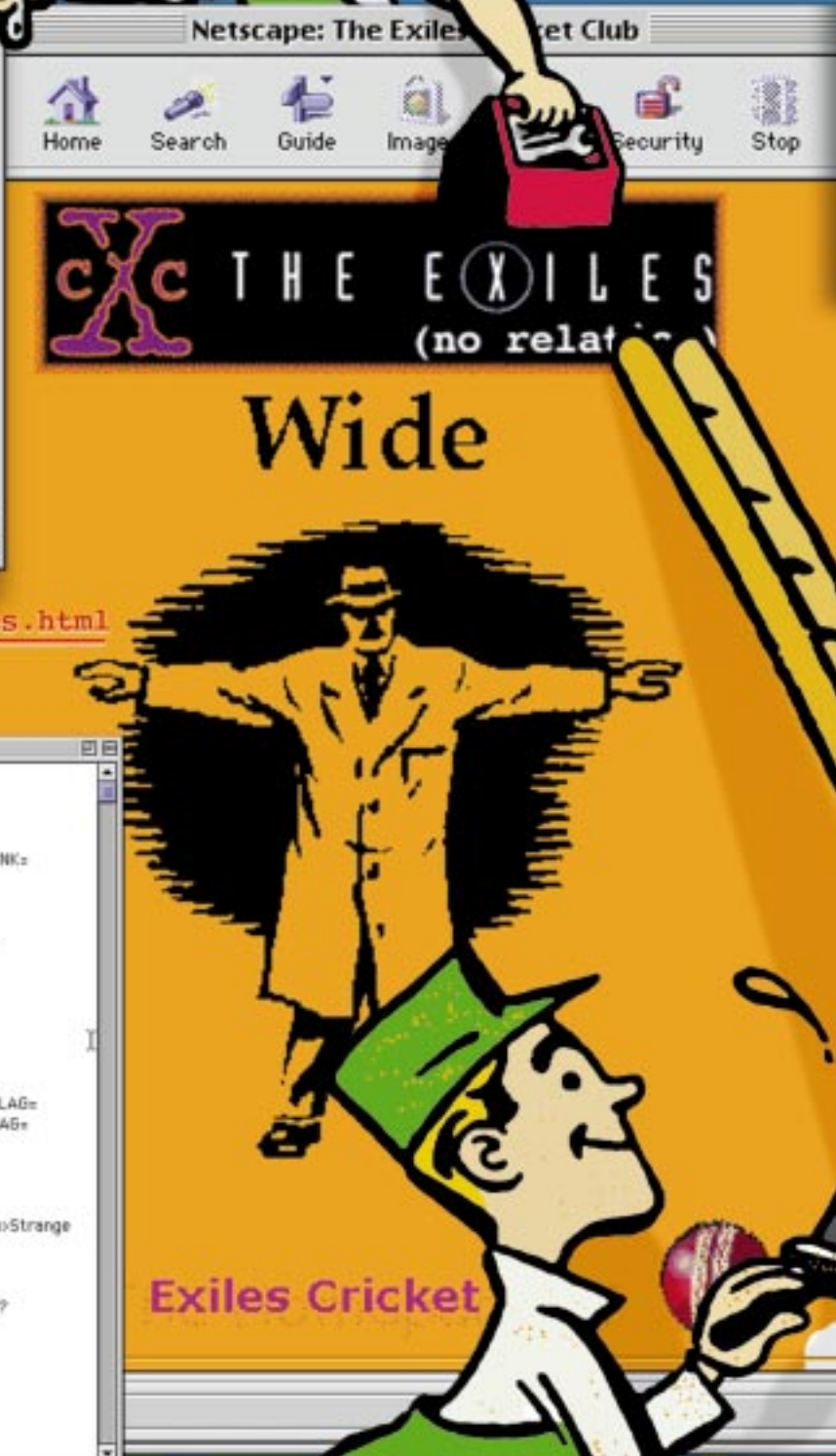
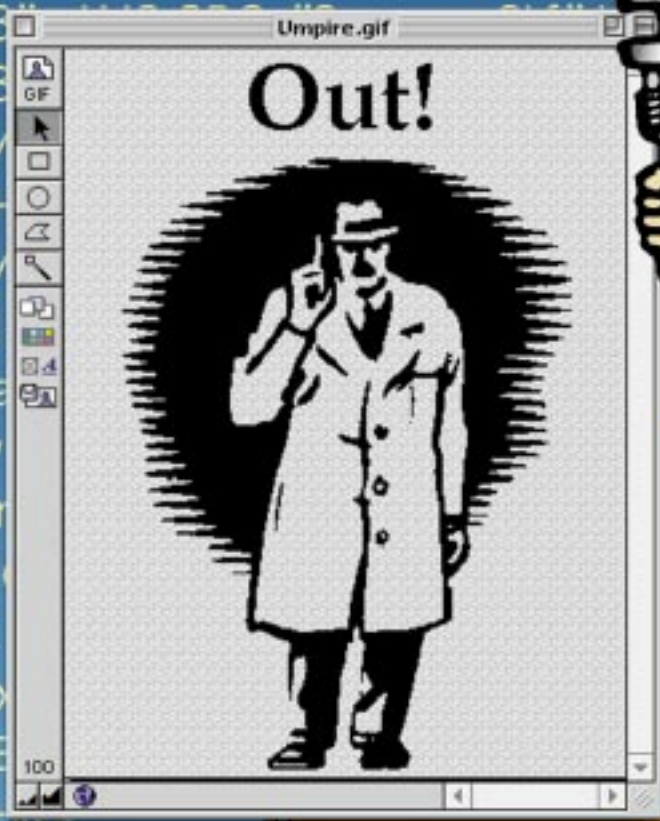
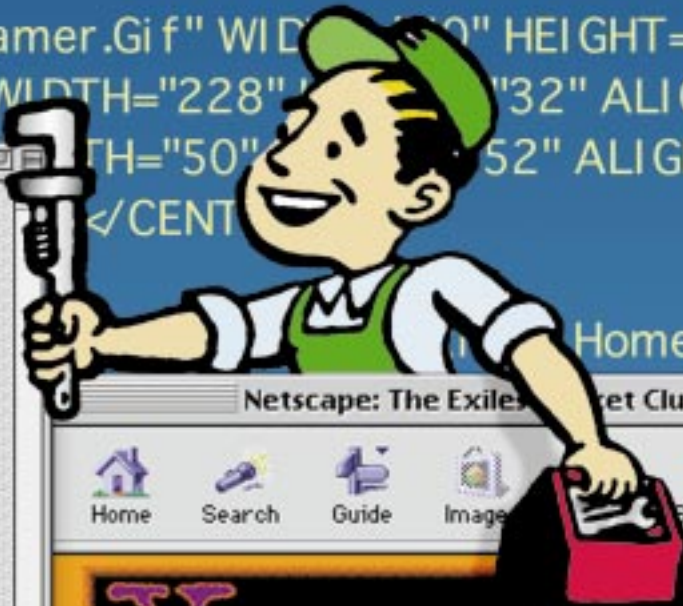
But the conventional bound codex as we know it today has been going strong since about the fourth century AD, when it took over from the scroll. Isn’t changing from this to an electronic medium going to require an equally massive culture change? “There’s already been a massive one. When Penguin produced its first paperback in the thirties, everyone said it was the death of the novel. ‘This isn’t a book,’ they said. ‘Where’s the hand-tooled vellum? Where’s the gold-embossed cover?’ Yes, it will need a substantial culture change. But in the next 100 years we’re going to have to have some very substantial culture changes anyway.

“Copernicus was the last person who was able to read everything that had been printed in his own language in his lifetime. Today, I don’t think there’s anyone around who has time to read books published in one year in a single lifetime. That’s without being exposed to 100 TV channels, *PCW*, and all the interactive stuff that’s out there. We’ve reached a point where it’s impossible to take in even a small percentage of what’s thrown at us every day. We therefore have to find a new, improved way of receiving and assimilating information.”

One possibility he moots is downloading memories of books into your head from a computer. So you won’t actually have read, say, the complete works of Barbara Cartland, you’ll just think you have. Or if that proves too horrendous a prospect, another idea — one that’s dealt with in *Host* — is to divest yourself of your mortal, physical body and upload its consciousness into a computer. Then, rendered immortal, you’ll have forever to pick and choose what you want to read, so information overload will become less of a problem. What may be a problem, however, is building a computer capable of hosting human consciousness in the first place.

“When I was researching *Host*, I talked to huge numbers of AI experts. Many of them were very despondent. Back in the seventies they’d envisaged that, by the year 2000, we’d be able to replicate human consciousness in a machine. But so far, they’ve only got as far as replicating the consciousness of a cockroach. If that.” Does he believe in some sort of cosmic intelligence behind everything, into which we’re all tuning, like radio receivers? “Why not? In 1920, 44 percent of scientists believed that there was some intelligence behind the forming of the cosmos. This year it was still 44 percent. The only shift was that fewer biologists believed it but more mathematicians did. I personally don’t have a problem with there being something out there. If it turned out that my consciousness and being were in part made up of data received from some other dimension in the cosmos, that would excite me tremendously. I would love to know that this isn’t the end of the journey.” ■

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<http://www.bogo.co.uk/p.shorrock/Exiles.html>



Exiles Cricket



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Work in progress



Tim Anderson reviews ten DIY web page design tools which make it easier than ever for a novice to join the net.

Have you always wanted your own web site but thought it would be too complicated? Well, it needn't be, so here's your chance to design your very own, with an easy-to-use web page design tool. We've tested ten leading packages and covered some of the tricky issues such as making files available for others to download. With the novice in mind, we've explained the key components like HTML, JavaScript and so on.

Anyone, from individuals to business organisations, can benefit from an online presence. Most ISPs give free web space to users so if you have an account all you have to do is to upload some content. You can set up a site on a network or on a PC, but it will not be accessible to others unless you have an expensive permanent connection.

The ideal web authoring tool should be no harder to use than a word processor and create pages compatible with every web browser, running on the Mac and Unix as well as Windows. It should accommodate frames, scripts, tables, databases, multimedia, animation and more.

The best tools produce standard, clean HTML documents and let you edit the HTML source when you need to. Advanced features include validation, which checks an HTML document for errors, and tools which manage a whole web site.

Most web authors keep a copy of the entire site on hard disk for editing, uploading work to the live site when ready. Many authoring tools come with personal web servers and upload wizards to make this process easier. Read on to discover which package is right for you.

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Ratings

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

ILLUSTRATION: Paul Shorrocks

Claris Home Page 2.0

Claris has a reputation for creating software that is genuinely intuitive to use, thanks no doubt to the company's background in Mac products. Home Page is available for both Windows and Mac, and provides a common-sense web-authoring package for non-experts. It works with Windows 95 or NT, comes on CD and includes a slim Getting Started manual that tells you most of what you need to know to build your own web site.

When you start Home Page for the first time, it opens to a blank page rather than offering any quick-start wizards or templates. There are two modestly-endowed toolbars across the top of the page, and the longest menu is the one marked Help. All these factors contribute to the plain-and-simple feel of the package, which is a strength, particularly for newcomers to web design.

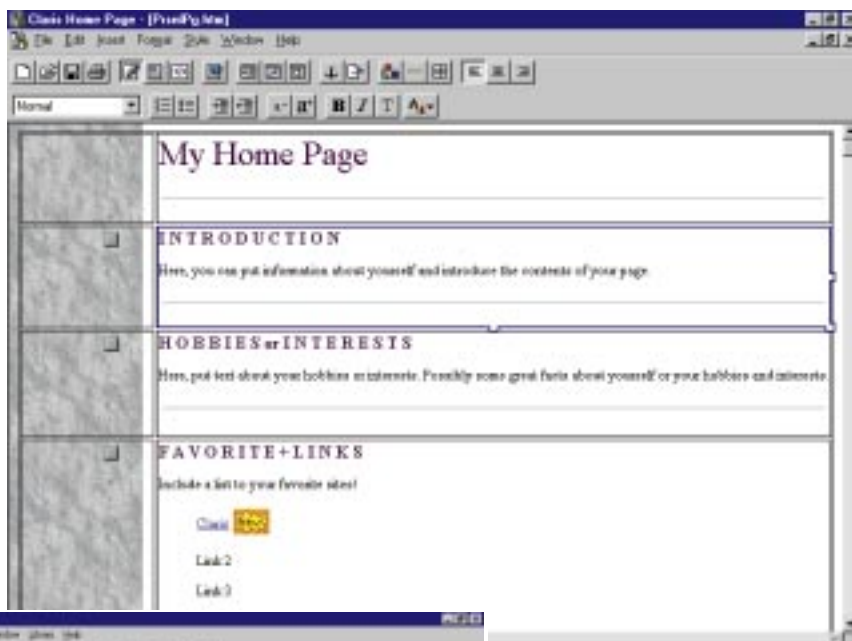
As with other Claris products there is more functionality beneath the surface than you realise at first, although some features are genuinely lacking. One good point is that the editor supports three view modes: WYSIWYG, HTML and Preview. This makes it easy to ignore the HTML, or to spend time tweaking it if you like to work under the bonnet. It is also an excellent way to learn HTML essentials, by providing a change to the WYSIWYG view and enabling you to see how the code changes.

Although the interface encourages you to just start typing, Home Page does provide some help in the form of templates and libraries. The templates are really just example pages categorised by style and purpose, and covering both personal and small business themes. The designs are unfussy, and there are no special features other than tables and frames.

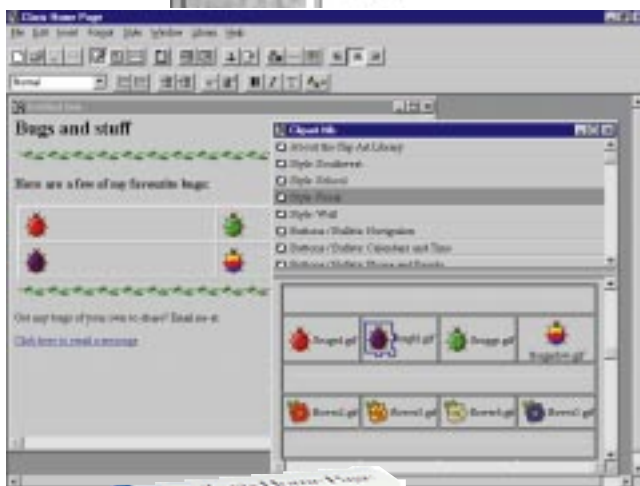
Home Page has a library system which lets you store any kind of HTML element including images, buttons, text and tables in a mini database that you can open in a window. When a library is open you can preview its contents and drag-and-drop to an open document. Simple but effective.

The Insert menu in the Home Page editor has options for Java applets, QuickTime movies and Netscape Plug-ins, alongside the usual elements like images and tables. Home Page is not especially smart about these features, but does offer convenient dialogs where you can set parameters. There is no integrated support for scripting.

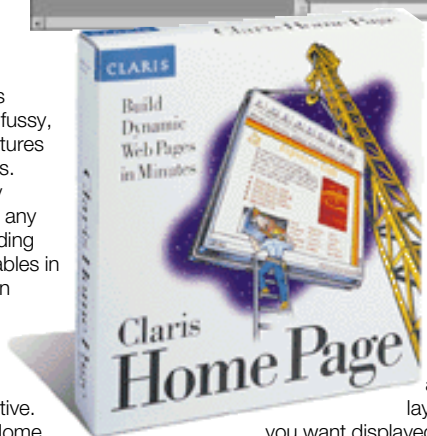
Tables are handled nicely, and columns and rows can easily be resized with the mouse. Right-clicking an image object lets



Above Home Page has a clean interface which is not intimidating for novices



Left The Home Page library modules let you drag-and-drop images into a document



you edit both client-side and server-side image maps to create hot spots that behave as hyperlinks or which run scripts on the server.

There is also great support for frames. All you need to do is create a new page asking for a Frame layout, add the files

you want displayed as frames to a dialog, and the frameset is created for you.

Although lacking in real site management tools, Home Page lets you define a site by adding a site file to a directory. This includes key information like the name of the target server and directory, along with log-in information for when you need to upload the site to an ISP. There is an option only to upload changed files, which saves time with larger sites. Another feature is consolidation, which checks all image references and

changes them to point to a single images directory on the server. Once you have created a site definition file, you can upload your web pages by opening the site file and clicking the Upload Site button.

Although Home Page looks barren alongside heavyweights like HotMetal and FrontPage, it has several advantages. First, you are far less likely to include a feature that causes compatibility problems with browsers or servers. Home Page is also good at including alternative text for display, for example when a frame layout is visited by a browser that does not support frames. Second, its interface is less cluttered than that of most of its rivals. And third, the application itself is lightweight, easy to set up and quick to load. For many people, one or more of those factors will make Home Page a good, practical choice.

PCW Details

Price £105.74 (£89.99 ex VAT)

Contact Claris 0345 413060 www.claris.com

Good Points Easily switch between HTML and WYSIWYG. Good with frames, tables and image maps. Modest system requirements.

Bad Points Needs more templates and examples. Limited feature set. Few extra tools.

Conclusion A great beginner's package, but underpowered for serious users.

★★★

Corel WebMaster Suite



Corel's web authoring suite is intended as a complete solution for web site creation and management. As you would expect from the creators of CorelDraw, it is weighted towards graphics and graphics tools. In fact, parts of this suite are based on other Corel applications including Draw and Photopaint. It takes up two CDs, needs Windows 95 or NT, and a typical installation is over 200Mb in size. Fortunately, now that hard disks of 3Gb and more are common on new systems, this may not be much of an issue. There is also a fat, disorganised, printed manual along with a handy colour guide to over 8,000 bundled images.

At the centre of the suite is WEB.Designer, a WYSIWYG page editor which turns out to be based on

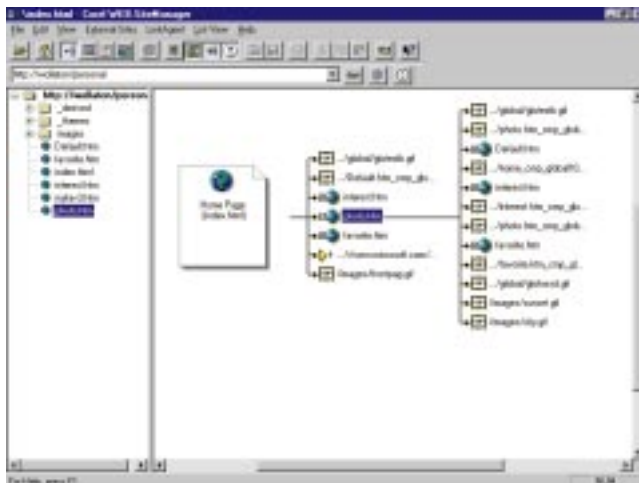
MacroMedia Backstage, another product entirely. It is customised by Corel though and includes a toolbar giving access to the other bundled applications. It is an adequate HTML tool but nothing special. You can start with a blank document, or open a template from a range of over 200.

There is a good frames wizard which takes you painlessly through the business of selecting and laying out a set of frames. Only one document can be open at a time but, once opened, you can edit the document in much the same way as you would in a word processor. If you insert an image, you can right-click to open a handy image-mapping dialog which can create both client-side and server-side maps. You can also open the image in PhotoPaint for editing. There



Left
WEB.Designer's editor is adequate but nothing special

Below, left
WEB.SiteManager is a handy utility for site management



highlighting. A nice touch is the Document Tree, which shows the hierarchy of tags in the current page.

Corel's WEB.SiteManager is a useful additional tool. It can open a site either from a local directory, over the web or on an intranet. Once open, you can view it in many different ways, including file lists and graphical display of links. You can set it to show the HTML source of a selected file, or a browser preview. The List View menu has options to filter the site, showing only those pages that meet certain criteria. The conditions include pages with broken links, pages that use Java and pages using JavaScript. This is particularly useful if you want to avoid certain features for compatibility reasons, or to check that you have provided alternative HTML for non-compatible browsers.

WebMaster Suite is great value if you need its graphical tools or clip-art. Purely as a web authoring suite though, it is disappointing, mainly because of the limitations of the central piece, the page editor. Its other problem is inconsistency and lack of integration because of the diverse origins of the component parts.

What's in WebMaster Suite?

- **WEB.SiteManager** — a graphical site management tool which handles link management. It includes a SiteBuilder Wizard for creating sites from templates.
- **WEB.Designer** — the most critical component. This is a WYSIWYG editor for creating and maintaining web pages.
- **WEB.PhotoPaint** — a bitmap editor which includes filters, masks, animation, and object transformation, along with standard painting tools. You can also create and edit image maps.
- **WEB.Draw** — a cut-down version of CorelDraw, a comprehensive drawing package.
- **WEB.Move** — an animation creator which saves its files as animated .GIFs, .AVI or .MPG movie, or a Java applet using Corel's Barista technology.
- **WEB.World** — for creating virtual reality files. These need a VRML plug-in to be displayed in a browser.
- **WEB.Data** — for database publishing. You can extract data from different formats into an HTML file, or view them in a Java applet. It does not handle dynamic database publishing.
- **WEB.Gallery** — an image browser.
- **O'Reilly WebSite 1.1** — a popular web server.

PCW Details

Price £186.83 (£159 ex VAT)
Contact Corel 0800 973189 www.corel.com
Good Points Fantastic value. Excellent graphical tools. Useful site management tool.
Bad Points Poor integration. Indifferent page editor. Hogs disk space.
Conclusion Excellent graphical tools but patchy as an overall web authoring package.
 ★★★

**Personal
Computer
World**
**Highly
Commended**

Microsoft FrontPage 98

BETA

FrontPage 98 is an ambitious product which aims to combine the ease of use of a typical Office application without compromising on features. This is the third Microsoft version and is in beta at the time of writing. It is a distinctive product and, unlike most other packages, is designed to interact with a real web server as opposed to loading files directly from disk.

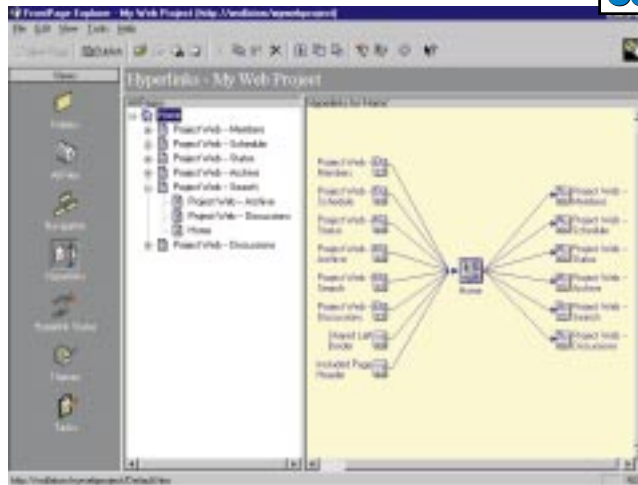
The advantage of the dynamic approach is that FrontPage can use the ability of web servers to run programs, rather than merely serve-up files. It relies on a suite of add-on scripts (FrontPage extensions) which are installed on the server. Some of these are used only at design time, while others are needed when the web site is deployed.

When you create a web page in FrontPage, you have two options. You can create it as a set of files in a directory, or on a web server which may be on the same computer or elsewhere. If you choose the files option, performance is better but some features will not work until the web is uploaded to a server. It is best to use a local web server for testing and upload to an ISP when you are happy with your work. It makes sense, but setting it up is initially confusing.

The need for extensions is a sore point with many ISPs which do not like third-party scripts installed on their servers, even when they come from Microsoft. It raises security issues as well as potentially reducing server performance. The fact is that using FrontPage Extensions raises the features available on a site to a new level, particularly if you are after some sort of interaction such as dynamic database searches, or for the surfer to leave a comment in a discussion group.

For the web author, the FrontPage approach has two implications. Firstly, you need to be wary about using the extensions, as the chances are that your ISP does not support them (FrontPage is still useful without them). Secondly, the use of FrontPage requires you to run a web server and, although Microsoft helpfully bundles the software, it adds to its complexity and system requirements.

Installing FrontPage is a nervous business since it involves installing a web server and/or server extensions as well as the main application. All going well, you will then be able to start the FrontPage Explorer, a site management tool that forms the main FrontPage interface. Your first action will probably be to run the Web Wizard, which



Left The FrontPage Explorer shows the whole site in a variety of different views

Below, left The outstanding FrontPage Editor has handy tabs for switching between WYSIWYG, preview, and HTML code view



functionality offered by the Insert menu. You can include animated text which flies across the page, database regions which give full read-and-write data access, Java applets, Netscape plug-in components, ActiveX controls, discussion areas, hit counters, videos, and form elements like buttons or check-boxes. Adding scripts is easy: you can insert a button, right-click to open the script wizard, build a script in the visual editor (it can be JavaScript or VBScript) and it's done. The hassle with these features is working out what they need to function correctly, either on the server or in the browser. For example, the animated text requires dynamic HTML as implemented in Internet Explorer 4.0 but it



will work from any server. The discussion area needs the FrontPage extensions, available for a variety of servers, while full data access requires Internet Information Server running on NT 4.0. What FrontPage needs is a compatibility setting, so you are not tempted to add features that may cause problems. Even so, FrontPage has the best WYSIWYG editor around. And you get Image Composer, too, a fine tool for editing graphics.

uilds a complete site based on your choice from six templates. Next, you customise the web by choosing a theme, which applies a set of graphical effects. Then you can double-click any of the new web pages to open it in the Editor for completion. The Editor itself is greatly improved from earlier versions. The main editing area has three tabs which display the page in WYSIWYG, HTML or Preview mode. The toolbars have an Office 97 look-and-feel, so if you can use Word you will have no problems editing a FrontPage document. There is a superb Frame menu which provides easy creation and manipulation of frame-based pages. Most interesting is the rich

PCW Details

Price £116.30 (£99 ex VAT); upgrade £76.38 (£65 ex VAT)

Contact Microsoft 0345 002000
www.microsoft.com

Good Points Office 97 integration. User-friendly editor. Superb range of features.

Bad Points Complex setup. No validation. Hard to work out what will work where.

Conclusion Sleek interface. Rich functionality, but beware compatibility problems.

★★★★

SoftQuad HotMetal Pro 4.0

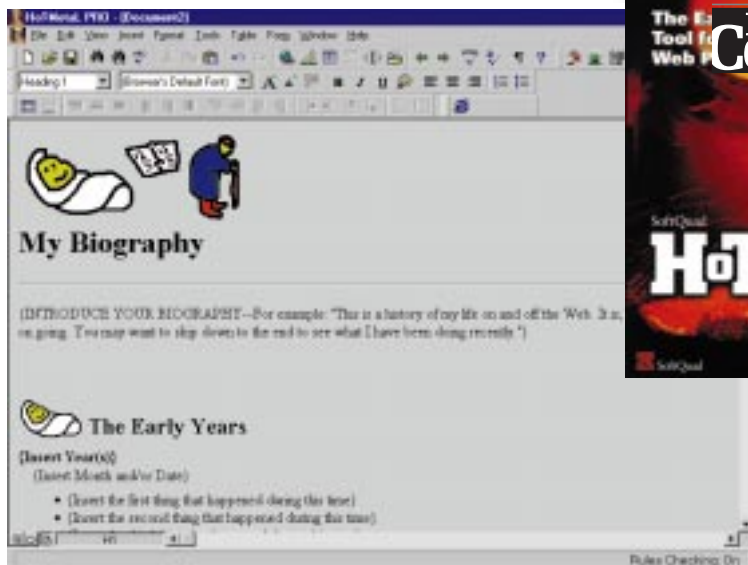
HotMetal Pro is a popular product which deserves its "Pro" tag. Unlike most others in this group test, a substantial manual is included along with a slim Getting Started guide. It comes with a generous bundle of extras and should almost be called a suite rather than an application.

At the heart of HotMetal Pro is a page editor with three viewing modes. In WYSIWYG mode you can treat it like a word processor with the usual toolbar for setting styles, colours, paragraph alignment and so on. HTML mode shows the source code with colour coding. The third mode is called Tags and shows each tag as a small symbol. When you click on a tag, the section of the document covered by the tag is highlighted. This view is more natural than pure HTML code but still exposes the tagged structure.

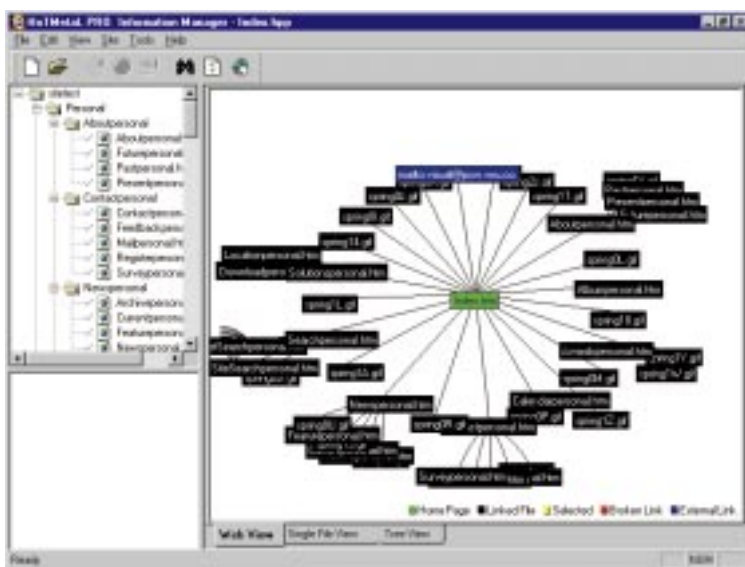
HotMetal Pro has hundreds of templates for creating instant pages, with categories for personal, business and intranet use. When the page is open in the editor, there is an array of further tools for editing and enhancing the page. The Insert menu offers ActiveX controls and Java applets as well as other options. One is Design-time controls, ActiveX controls that are not required when the page is viewed but will automate certain authoring tasks. The other options include a slideshow, a control for creating an outline view of your site, and a button that opens a new browser window. Some of these features require Dynamic HTML as used in Internet Explorer 4.0. There is also a database import wizard which lets you query a standard database or spreadsheet and put the results into an HTML table. This type of data access is static: the user cannot query or refresh the data when browsing the web.

The Tools menu reveals some excellent additional goodies. Image Editor and Image Explorer open applications from ULead's Photolmpact package. This is a cut-down version but still more powerful than the average bundled image editor. FX Chooser is a browser application that accesses a library of graphics, animations, Java applets and JavaScript code snippets. You can drag-and-drop from the browser to your web page.

Infuse Acadia ScriptBuilder is another bundled tool, a visual editor for creating JavaScript code. Best of all is an option to check HTML code, which runs the HotMetal Pro validator that runs through the HTML and identifies any errors or tags which are likely to cause compatibility problems. You can



Left HotMetal Pro has a clean interface that looks reassuringly like a word processor

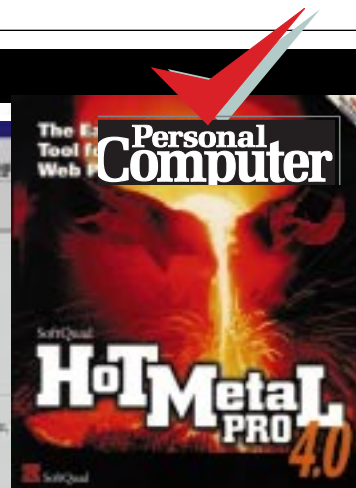


Left Information Manager gives you an overview of your site, together with management tools

instruct the validator to list any HTML extensions used which are specific to Navigator or Internet Explorer. It also shows extensions not supported by HTML 2.0 so you can easily design for maximum compatibility if you wish. This is a great tool that can save much grief at later stages.

Like Microsoft's Front Page (p195) HotMetal Pro lets you view a site as a whole, as well as edit individual pages. Information Manager is a separate application which integrates with the editor. You can view a web site in three different ways: as files, in a tree view, or as a web diagram.

You can open a file for editing directly from Information Manager. Links are shown and you can create new links by drag-and-drop. It is intelligent about links and if, say, you rename a file, the links to it in the site are automatically updated. There are tools for showing and fixing problems like broken links, and a Publish option for copying the site to a server. This can be set to upload only new or changed files and is useful if you have a large site to maintain. You can run the Site Maker wizard through Information Manager, which



creates a complete web site based on your choice of theme and décor. There are suitable pages for personal, business and intranet sites and you can mix and match from all three.

Included on the HotMetal Pro CD are several other third-party tools. There is a personal web server, ZBSoft's ZBServer, DTL's

Dataspot for publishing databases with dynamic search, the Starbase version control manager, VReam's virtual reality creator and Aimtech's Jamba tool for Java applets. In general, these are cut-down but working versions of the full products.

PCW Details

Price £123.38 (£105 ex VAT)

Contact SoftQuad 0181 387 4110
www.softquad.co.uk

Good Points WYSIWYG and HTML editors. Integrated validation tool. Excellent features and extra tools.

Bad Points No side-by-side view for code and preview. Use of third-party tools limits integration. Slow screen update in WYSIWYG mode.

Conclusion An excellent all-rounder, with a good bundle of extras.

★★★★

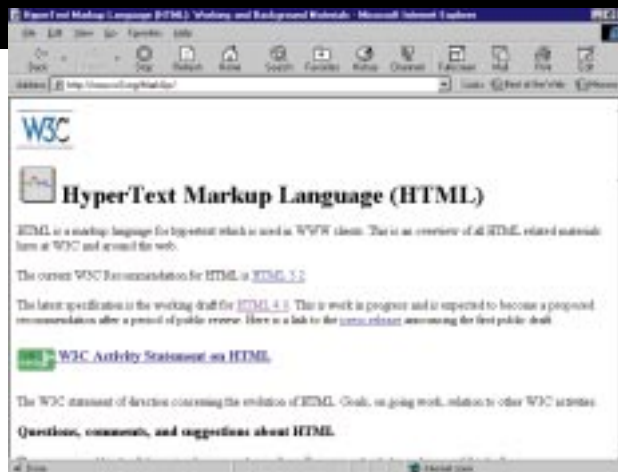
All about HTML

Before the web took off, use of the internet (email apart) was reserved for techies who typed-in arcane command-strings. Visiting a site meant logging in, getting a directory listing, downloading the file you wanted and logging off. But HTML changed all that.

HyperText Mark-up Language was designed to accomplish two things: to present formatted text with images that looked good across different computer platforms; and to provide one-click access to internet sites through hyperlinks, "hot" areas of text which open other HTML documents, irrespective of their location on the net. This made navigating the web no more difficult than reading a Windows help file (but much slower).

The dramatic growth of the net meant that the original capabilities of HTML soon proved inadequate. Many new tags have been devised, in particular by Netscape and Microsoft which provide the fullest-featured web browsers. The result is that HTML is changing from being a document type, into a way of running programs, accessing databases, playing multimedia and ordering goods. Because it was not designed for this, some of the consequences are ugly. For instance, an HTML page full of program scripts is hard to debug and maintain.

Another aspect of HTML's evolution is that page designers want as much control over what you see on a web site as they would



The home of HTML is this modest site run by the World Wide Web Consortium

is version 3.2, although HTML 4.0 is already published in draft form.

Longer-term, the web will change radically as XML (Extensible Markup Language) is developed. It will let you devise your own customised markup language, to reduce

dependence on the over-burdened HTML. XML is a cut-down version of SGML (Standard Generalised Markup Language), an international standard for defining document types <www.w3.org>.

Web authors should be wary. Every browser supports a different subset of HTML, perhaps adding its own unique tags, too. There is a trade-off between sophistication and universal readability. If you want everyone to be able to read your page, use HTML 2.0. If you are happy with the latest Netscape Navigator, use that as your standard. Most sites aim to support the current versions of both Navigator and Internet Explorer.

have with a printed page. However, HTML was not intended to provide precise control over appearance, but rather, to be reformatted by the browser to retain the *structure* of the document on different systems. Although many editors *claim* to be WYSIWYG, with HTML you cannot guarantee what the page will look like on another system.

The HTML standard is formally controlled by the W3C (World Wide Web Consortium). Inevitably, both Netscape and Microsoft race ahead with new features without giving the W3C time to ratify or reject them, although both companies claim they will eventually conform to the official standard. Currently this

Choosing an ISP

For those of us not blessed with a permanent internet connection, getting onto the web means opening an account with an Internet Service Provider (ISP) and using space on one of its servers. The good news is that all the leading ISPs, like AOL, CompuServe, Demon and MSN, provide web space to all their customers.

There are variations in terms of what each ISP provides:

■ **How much space?** AOL offers a generous 10Mb, while Netcom gives a basic 1Mb. There will be extra costs if the initial allowance is exceeded.

■ **What about bandwidth charges?** A nasty piece of small print in some agreements states that extra charges will be made if there are more than a certain number of hits to your site, or more than a certain amount of bandwidth (in other words, data transferred).

To be fair, this protects the Information Service Provider from one or two very popular sites spoiling the party for other users by slowing down the system.

The catch is that you have no control over who may visit your site. It is best to choose an ISP that does not impose bandwidth charges.



Netcom has a pagebuilder wizard which lets you create a web site in minutes. Other ISPs, like AOL and CompuServe, have a similar service

■ **What facilities do you want?** Some web features require programs to run on the server. If you want to use these, ask your ISP what CGI scripts (Common Gateway Interface is a standard way of programming a web server) are available and whether you can add your own.

Generally the answer will be no, unless you have a more expensive business-orientated service. This includes the FrontPage Extensions, Microsoft's add-on scripts that empower extra functionality in FrontPage-authored webs.

deeper pockets, some ISPs offer custom authoring services at a cost.

■ **Domain name registration.** Would you like to be www.yourdomain.com instead of www.aol.com/~nobodymuch? You can be, but only by paying an annual fee. Most ISPs provide this service, but some do not (AOL, for instance).

■ **Information.** Chances are you would like to know how many people visit each page on your site. Some ISPs can offer detailed data about where those hits originated. Most web activity is logged somewhere along the line.



Adobe PageMill

Available for both Mac and Windows 95 or NT, PageMill aims to provide an easy-to-use WYSIWYG layout tool. It is bundled with an excellent graphics tool (a cut-down version of PhotoShop) but there is no integration between the two. Nor are there any site-management tools. Like Claris Home Page, PageMill is dedicated solely to page layout. There are no wizards or templates, other than a few sample web sites on the PageMill CD, but there is a smart, printed manual.

PageMill has several attractions. It has a traditional word-processor style interface but clicking a large button switches to a fast preview mode. Its preview is better than most, with working hyperlinks and even support for Netscape plug-ins, but not for Scripts or Java applets. There is also a two-colour HTML source view which lets you edit the code. A toolbar enables access to standard formats and objects like buttons and check-boxes.

The table editor is simple but effective and editing frame-based pages is exceptionally easy. Simply choose Split Frame from the Edit menu and the current page is divided into two. Select a frame, and you can split it again



as you wish. You can insert an existing page or new content into a frame and you can also resize it with the mouse.

Another nice feature is the pasteboard, a tabbed window into which you can put any HTML items that you may need again. You can then move them back into a web page using drag-and-drop. This works with hyperlinks, so it is a handy way to add the same link several times in a document.

Extra functions include a Place Object option that lets you insert an image, sound, Java applet or Acrobat .PDF file. Acrobat is Adobe's cross-platform viewer which, unlike HTML, lets you preserve the exact layout and

PageMill's WYSIWYG editor, with the Inspector and tabbed pasteboard showing

formatting of a document. PageMill also handles image maps neatly. Double-click an image, and drawing tools appear on the toolbar. You can then draw shapes on the image, and set links for them just as you would for other hyperlinks. It is nothing special in terms of features, but as a solid, fast, common-sense page-editing tool, PageMill is outstanding.

PCW Details

Price £92.83 (£79 ex VAT)
Contact Adobe 0181 606 4000
www.adobe.co.uk

Good Points Excellent user interface. Easy frame handling with fast internal preview.

Bad Points No wizards or templates. No site management. Limited features.

Conclusion The best of the products which major on ease of use, rather than features.



Allaire HomeSite

The creators of HomeSite are champions of the cause of straight HTML editing. They point out that WYSIWYG editors do not support every available tag, often create inefficient code and give less control over layout than raw HTML. All true, but for sheer productivity WYSIWYG is hard to beat. There is room for both, though, and if code editing is your

preference, HomeSite is an excellent choice.

The interface is a delight. The edit area supports multiple documents and has two tabs along the top, one for code and another for page preview. If Internet Explorer is installed, HomeSite will embed the IE browser into its preview pane.

The editor is colour-coded and there is a full-screen option. There is also a project

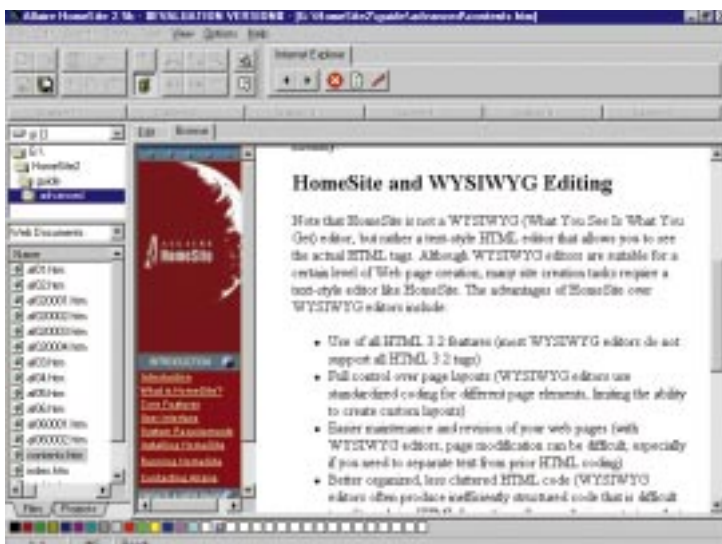
manager, which can show either a file directory or the contents of a HomeSite project.

Where there are image files, these can be dragged into the editor. You can also display an HTML reference pane, with tags listed and explained, and a tag list where you can double-click an item to pop it into the page.

HomeSite has wizards for inserting tables and frames and another for visual list editing. You can customise HomeSite by creating custom menus, each of which can hold 16 entries consisting of any HTML code you like. These end up on a toolbar, where you can drop-down the list and immediately add the contents of an item to the editor.

A validator is not built in but can easily be installed. There is also a neat but drastic option to strip all tags, ideal for rescuing the text from a badly messed-up page.

HomeSite is a great programmer's tool, but although you can get started easily it is only suitable if you are determined to learn low-level HTML. Expect to see the new version, HomeSite 3.0, out soon.



HomeSite is an HTML code editor with many time-saving features

PCW Details

Price £76.38 (£65 ex VAT)
Contact Allaire/Unipalm 01638 569600
www.allaire.com

Good Points Good for accessing and programming low-level HTML.

Bad Points No built-in validator.

Conclusion The best HTML editor around. Ideal for programmers.



Asymetrix Web Publisher

Many applications have wizards, but Web Publisher is a wizard without an application — or that's how it feels. Web pages are created by proceeding, step-by-step, through dialogs.

First, pick a theme. Next, add pages based on one of four layout styles, each of which combines a title, text and a single graphic. A miniature of your page appears. You double-click on a text box in the miniature to open a text editor where you can add text and basic formatting like alignment, heading level, and bold or italic. You can also define hyperlinks.

The last step is to click a Generate button that builds web pages from the information you have supplied. Web Publisher will open the pages in a specified browser for testing, and there is also a deployment wizard for uploading pages via FTP (File Transfer Protocol) or copying them across a network.



The best thing you can say for Web Publisher is that the web pages it produces look swish provided that one of the supplied templates is to your taste. They are highly colourful, and there is an option to include Java buttons — more interesting than the standard HTML button or hyperlink.

It is easy to use, although you have to hold your breath lest anything goes wrong. On one

Highly automated and rather inflexible, Web Publisher nevertheless lets you create bright, colourful web pages

occasion during testing, Web Publisher refused to generate a page, with a mystifying "Could not load resource" error message and no clue as to how to fix it. Even more serious, the generated pages did not display correctly in Navigator 4.0 although they looked fine in Internet Explorer. In Navigator a large, blank column appeared, pushing the content too far to the right. All this underlines the danger of working with a highly automated tool: when it goes wrong, there is no way of recovering without learning all the nasty HTML stuff from which the tool is meant to protect you.

PCW Details

Price £70.50 (£60 ex VAT)

Contact Asymetrix / PSC 01923 208433; www.asymetrix.com

Good Points Easy to use and it creates bright, arresting pages.

Bad Points Problems with Navigator 4.0. Inflexible. Hard to troubleshoot.

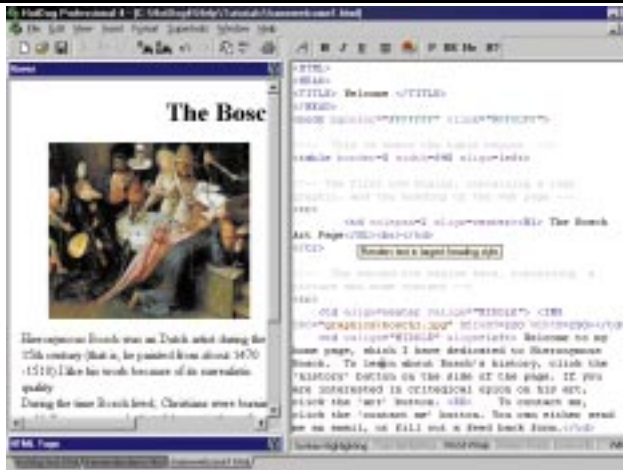
Conclusion Very easy dialog-based authoring, but most will find it too limiting.

★★

Sausage Software HotDog Pro 4.0

HotDog from Sausage Software is a well-established shareware web authoring tool. Now at version 4.0, it is a feature-rich package which includes downloadable extras, called Supertoolz, to supplement the standard application. HotDog is not WYSIWYG but is based on a colour-coded HTML editor. It is therefore suited to those willing to learn at least the basics of how an HTML page works. An internal browser, called Rover, can be displayed alongside the editor to provide a near-instant preview of your page, although it cannot execute Java or JavaScript and had problems with frames in some of our tests. It is an ideal layout if you like working directly in HTML.

When you start a new document in HotDog, you get a bare outline HTML page. Then it is a matter of typing away, or using one of HotDog's many helper tools to insert page elements. The editor handles syntax highlighting which colour-codes the HTML tags to help you distinguish them from your text, and tag highlighting which marks a tag in red if it has invalid parameters. There is excellent use of ToolTips in the editor itself, so that when the mouse is over a particular tag



or parameter, a tip message pops up explaining what it does. Another handy tool lets you show a list of tags in a window, from which you can drag-and-drop to the editor. If you right-click a tag and choose properties, you get a brief description.

There are wizards to handle elements like forms, lists, frames and tables. The Supertoolz add-ons work seamlessly with HotDog and provide extras like a visual table editor, JavaScript editor, text effects wizard and image mapper. Some of these cost extra, while others are free to download.

HogDog Pro is impressive, laden with

HotDog's Rover gives a handy preview, while HTML tooltips help you find your way through the forest of tags

features and eminently usable, but there are a few rough edges. For some reason, the open and save dialogs took over a minute to appear on the test system, running Windows NT 4.0. The interface is not always consistent, particularly when it comes to Supertoolz. But if you can tolerate the ugly Sausage logos, HotDog is a good choice.

PCW Details

Price £81.08 (£69 ex VAT)

Contact FourthNet 01252 345441 www.sausage.com or www.hotdog.co.uk

Good Points Crammed with features. Helpful code editor. Side-by-side code and review windows.

Bad Points Some rough edges. Interface slow in places. Needs knowledge of HTML.

Conclusion All the features are there, but there are better packages for integration and ease.

★★★

Netscape Composer

Composer has two strong attractions. One is that it is part of the Netscape Communicator suite, which also includes Navigator, the popular web browser. The other is that its uncomplicated interface, similar to a word processor, makes it easy to get started.

The editor is fully WYSIWYG and there is a spelling checker. You can view the HTML source but it is not editable from within Composer. Instead, you need to specify an external editor which can be anything from Notepad upwards. In the same way, there is no supplied image editor. If you stay within Composer, you can easily edit text, with fonts and basic styles, and insert links, tables, images and lines. Tags not directly supported can be inserted into the page, where they appear as symbols. There is no support for frames, scripting, or Java applets. Instead, Netscape has a separate tool, Visual JavaScript, which is aimed at developers.

Netscape seems to take the view that most people have a permanent connection to the internet, or are happy to constantly use a dial-up connection. For example, an innocent



option like "New Page from Wizard" connects you to Netscape's site in order to run an online, HTML-based Wizard. When you finally get there, the Wizard is a disappointment. You can also create new pages based on templates, which are available from Netscape's site.

A nice feature is the Document Info option which generates a report showing the document structure with all its links, although there is no tool to show the structure of an entire web site.

Integration with Navigator could be better. When you preview a page, Navigator opens in

Netscape Composer has an online page wizard but sadly it is not worth the connection time

an entirely separate window. Finally, there is a useful Publish option which uploads a completed document to your web site.

If all you want to do is throw up some basic pages, and if you use Navigator, then Composer is a good, convenient option. However, it is hard to imagine serious users staying with it for long, because of its limited range of features.

PCW Details

Price £52.88 (£45 ex VAT) as part of Communicator suite

Contact Grey Matter 01364 654100
www.netscape.com

Good Points Clean, clear interface. Good implementation of basic HTML features.

Bad Points No frames or scripting support. Relies on external editing tools. Some features do not work offline.

Conclusion Composer is fine for getting started but you will soon want to move on.

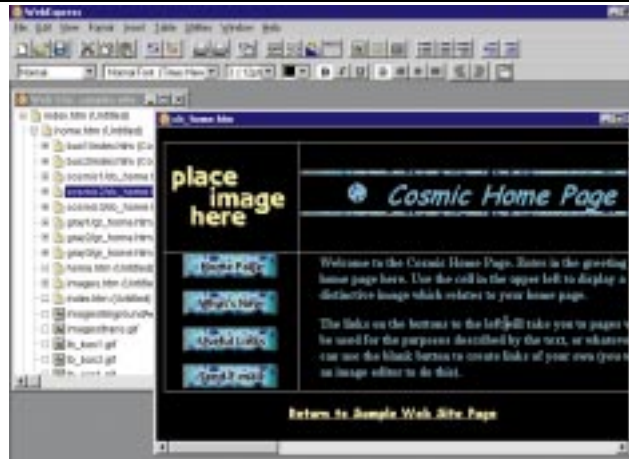
★★

MicroVision WebExpress 2.0

WebExpress is a cheerful Shareware application that includes simple site management as well as a WYSIWYG page editor. It comes on just two floppy disks or it can be downloaded. Registered users receive a short, printed manual. The best way to use it is to create or open a WebExpress site, specifying a base directory along with the eventual target URL. This opens a web site manager window which lists all the pages in the site in a tree view, with the tree based on the links between the pages. Any broken links are also shown in the manager window. Double-clicking a document then opens it in the main editor.

Like Home Page and PageMill, WebExpress has full coverage of basic HTML features but stops short of the more advanced or recent developments supported by tools like FrontPage or HotMetal Pro. To get you started, a range of sample pages and small web sites is installed with the package.

WebExpress comfortably handles tables and frames. Image maps are supported, but via a difficult dialogue in which hotspot co-ordinates are entered manually. A nice feature is that you can maintain a permanent list of



URLs so that frequently-used items such as your home page or email address can be easily inserted as links. There is no integrated HTML source editor but there is a link to Notepad.

WebExpress is an MDI application, which means it handles multiple documents in the same way as Word. Each document window can be resized or maximised and the open windows can be tiled or cascaded. This does not work well in WebExpress, the reason being that the Web Site Manager is treated as just another document. If you maximise the document on which you are working, the Site Manager disappears behind it. This is a mess,

WebExpress is easy to use and capable, despite its rough edges

and HomeSite's technique, of having a docked project window with open documents alongside it, separated by tabs, is far better.

Another problem is that WebExpress occasionally generates invalid HTML tags, although in our tests this was easy to fix.

Overall, WebExpress is a straightforward and capable product.

PCW Details

Price £57.59 (£49 ex VAT)

Contact The Thompson Partnership
01889 564601 www.mvd.com

Good Points Full-featured shareware. Easy frames support. Windows 3.1 version available.

Bad Points Sometimes generates invalid HTML. No code editor. Untidy interface.

Conclusion A strong shareware product but the interface needs a bit more work.

★★★

Editor's Choice

Creating a web site is easy. The quickest way is to sign up with an ISP that has an online site-building wizard. You can create a site in a few minutes and because it is done online, there is nothing to upload. Creating a good web site is not easy though, as any web surfer will tell you. Problems include broken links, large graphic files, scripts that do not run, or sites that are simply ugly and hard to navigate. This is where having the right authoring tool pays dividends, so here are our recommendations.

For a small web site, such as the personal or family pages often uploaded to AOL or CompuServe, the priority is an easy-to-use page editor which generates standard, universally-compatible HTML. Many of the tools mentioned here will do this, but both Adobe PageMill and Claris Home Page are outstanding as safe, lightweight authoring tools. PageMill offers a slightly better interface and feature set. It is also worth taking a look at what your usual word processor or desktop publishing package will do. Word, WordPerfect and WordPro all have good HTML export options. Microsoft Publisher is fine for creating a simple site.

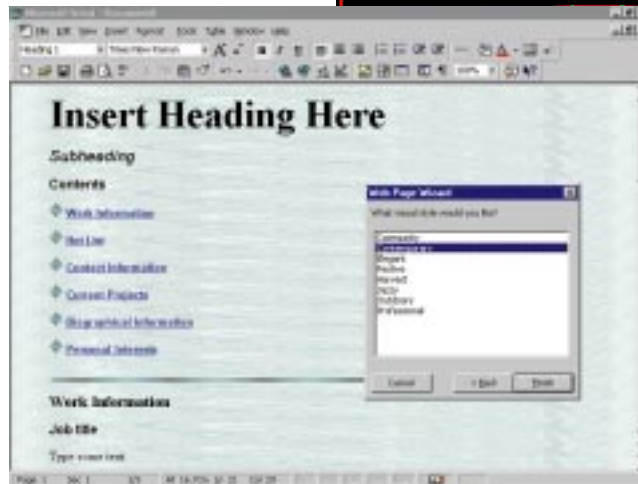
Once your site gets beyond a few pages, site management becomes an issue — it is easy to end up with broken links or unreachable pages. FrontPage 98, HotMetal Pro and WebMaster Suite have particularly good management tools integrated with their related page editors. Of these, FrontPage has the best page editor, but HotMetal Pro offers HTML validation which tips the balance in its favour.

For the most ambitious web sites installed on an intranet or on a site where custom scripts are available, the priorities are different again. Essential elements include scripting tools, strong Java support and the ability to

build dynamic links to databases. If it is an NT-based intranet where most or all of the browsers are on Windows, FrontPage 98 is the best choice. The editor is slick, and features such as discussion groups and database access regions are genuinely easier with FrontPage.

For more general use, the first choice is HotMetal Pro which, in its latest version, comes with stunning graphical tools, a fine editor for both WYSIWYG and raw HTML code, good site management and that all-important validation option.

HotMetal Pro 4.0 is therefore our **Editor's Choice**, while **FrontPage 98** and **Adobe PageMill** are **Highly Commended**.



Hot stuff: With HotMetal Pro 4.0 you can use Word 97 for web editing. It even has a web wizard

Spicing up your web site

The days when web users were content with formatted text are long gone. Today's sites are bursting with colour and dynamic, interactive elements. Here's how it's done.

■ Graphics

Carefully deployed, graphics are a web author's best friend. The secret is to keep them small to reduce download time, and to take care over their content. That is why image-editing tools are vital. You should certainly install a good bitmap editor such as the shareware PaintShop Pro, or acquire one of the authoring packages which includes strong image tools. Another possibility is to get hold of a dedicated product like Asymetrix Web 3D, capable of spectacular graphic effects and orientated towards web design.

■ Plug-ins

Plug-ins are extensions to Netscape Navigator, also supported by Microsoft Internet Explorer. Once you have installed a plug-in, you can browse web pages which

include data understood by the extension you have installed. This might include video, sound, special effects, virtual reality spaces or extra graphical features. Plug-ins are usually free but software to author material for a particular plug-in may cost extra. Not all plug-ins are available on every platform, so watch for compatibility problems.

■ ActiveX

Microsoft's ActiveX technology is conceptually not that different from a plug-in, except that ActiveX extensions are installed into the operating system and are not just available to browsers. Some ActiveX controls take a while to download but once installed they can execute speedily since they are native Windows code. The main snag with ActiveX is that most controls work only under Windows (not surprising since it comes from Microsoft). Another concern is security, but code-signing, a way of proving the origin of a particular control, is a reasonably effective preventative measure as long as the user understands the issues.

■ Java

Java is a programming language which compiles code that runs in a VM (virtual machine). A VM is a layer of software between the application and the underlying operating system. The advantage is that a Java application runs anywhere, as long as a Java VM is available.

VMs exist for Windows, the Mac and many varieties of Unix, so Java is a true cross-platform language. Web authors can insert Java applets (mini applications) into web pages so that they run inside your browser.

Java applets run only in a browser and are prevented from accessing your computer (a technique called sandboxing) and this prevents Java viruses. The latest browsers support signed Java applets which can access your resources but must declare their origins in the same way as a signed ActiveX control. To create Java applets, visit the Sun or Javasoft web sites for freely downloadable tools. The main snag with Java is that applets can be slow to download, and sometimes slow to execute, as well.



Table of Features					
Supplier	Adobe	Allaire/Unipalm	Asymetrix/PSC	Claris	Corel
Name	PageMill 2.0	HomeSite 2.5	Web Publisher	Home Page 2.0	WebMaster Suite
Tel	0181 606 4000	01638 569600	01923 208433	0345 413060	0800 973189
Web site	www.adobe.co.uk	www.allaire.com	www.asymetrix.com	www.claris.com	www.corel.com
Price (ex VAT)	£79	£65	£60	£89.99	£159
Price (inc VAT)	£93	£76	£71	£106	£187
Validation	No	Add-on	○	○	○
Image editor	●	○	○	○	●
Image mapper	●	○	○	●	●
Insert Java applet	●	○	○	●	●
Scripting	○	○	○	○	○
Animation tools	○	○	○	○	●
Database tools	○	○	○	○	Partial
Site management	○	○	○	○	●
Clip-art library	●	○	●	●	●
Web server bundled	●	○	○	○	●
Spell-checker	●	●	●	●	●
Insert ActiveX	○	●	○	○	●
WYSIWYG	●	○	○	●	●



Table of Features					
Supplier	Microsoft	Netscape	Sausage Software/FourthNet	SoftQuad	The Thompson Partnership
Name	FrontPage 98	Netscape Composer	HotDog Pro	HotMetal Pro 4.0	MicroVision WebExpress
Tel	0345 002000	01364 654100 (Gey Matter)	01252 345441	0181 387 4110	01889 564601
Web site	www.microsoft.com	www.netscape.com	www.sausage.com or www.hotdog.co.uk	www.softquad.co.uk	www.mvd.com
Price (ex VAT)	£99 (£65 upgrade)	£45 (part of Communicator suite)	£69	£105	£49
Price (inc VAT)	£116.33 (£76.38 upgrade)	£53	£81	£123	£58
Validation	○	○	○	●	○
Image editor	●	○	○	●	○
Image mapper	●	○	●	●	●
Insert Java applet	●	○	Add-on	●	○
Scripting	●	○	Add-on	●	●
Animation tools	●	○	Add-on	●	○
Database tools	●	○	○	●	○
Site management	●	○	●	●	●
Clip-art library	●	○	○	●	○
Web server bundled	●	○	○	●	○
Spell-checker	●	●	●	●	●
Insert ActiveX	●	○	○	●	○
WYSIWYG	●	●	○	●	●

Key: ● Yes ○ No

This table does not include every feature, since all the tools support basic HTML elements. Note also that most things can be accomplished through direct HTML editing, even where a feature is not specifically supported.





Caught on camera

Our snap-happy scribblers, Adele Dyer and Paul Trueman, rounded up 14 digital cameras for a visual assault on an unsuspecting still life.

In the last year, digital cameras have gone from being experimental toys to serious alternatives to compact silver-halide film cameras. Just about every company that makes film, cameras and even lenses has been getting in on the act, aware that if they do not go digital, they may well go out of business within the next few years. So the number of cameras has risen; the prices have gone down, and the features they offer have improved. But of prime importance to everyone is the quality of the digital images they produce.

Last year we looked at ten digital cameras. This year we could have played with twice as many, but we restricted ourselves to fourteen, half of which are brand new. And keep your eyes peeled for yet more digital cameras hitting the shops just in time for Christmas, which we have rounded up on page 224.

The only way to assess digital cameras is to compare output. Using a still-life setup of flowers and fruit, with plenty of colours and textures, we'll show you what to look for in terms of quality, both good and bad. Many of the cameras offer much more than just the capacity to point and shoot. Some have zoom lenses, some let you record sound and output the whole lot to a TV or video player, and one even lets you write notes on the touch-sensitive screen.

But for those who are confused as to how a camera can capture an image without film, we also explain how digital cameras work. So if you want to find out everything there is to know about flash memory, charged coupled device and JPEG compression, check out page 222 to find out more.

We have taken account of all the factors and come up with a few ideas for Christmas presents, should Santa be feeling generous.

Digital cameras Contents

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Ratings

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

Canon PowerShot 350



The most frustrating feature of the PowerShot is the way it turns itself off in almost no time at all. Leave it for 60 seconds and it shuts down. An optional power setting would have been good. The designers have been as careful with the camera's appearance as they have with its power management: it was one of the best-looking cameras we saw, with a metallic silver finish, a 1.8in Liquid Crystal Display (LCD) and a well-placed "shutter" button.

The camera has just a single resolution, 640 x 480, but there are three levels of JPEG compression so you can save on memory. The option buttons on the back are less well thought out. With the best cameras you can work out the extra functions without pouring over the instructions, but here that is impossible. The symbols are confusing and the fussy rubber buttons are a poorly executed annoyance. We found the clear photos that the camera takes a welcome surprise.

Canon's software for opening up the pictures contains a little too much detail. One on-screen button too many had to be pushed, and although it only took 25 seconds to download, the software made it seem longer.

In spite of the poor-quality LCD, the PowerShot 350 does deliver great-quality photos.

PCW Details

Price £586.32 (£499 ex VAT)

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

Good Points Lovely finish. Good manuals. Great photo quality.

Bad Points Poorly thought-out function buttons. Finicky software.

Conclusion With a little more care, it could have been a contender.

★★★

Casio QV-200



The QV-200 is the first of four budget cameras Casio is launching before Christmas, and at £399.99 the QV-200 offers a couple of extras you usually associate with expensive cameras.

It has the same swivel head lens and LCD screen that all the Casio cameras have, so you can take your own picture. The lens can swivel through 270 degrees, but the LCD is poor. The picture is not very sharp and as on most digital cameras, the display cannot provide fluid coverage of quick motion, giving not so much a jerky effect as a giddy slow-motion feel. Once the photo has been taken, the camera can perform a number of impressive features such as photo rotation, colour change (say, to sepia or b/w), TV-out, and a selection of twenty background colours.

There are two varieties in the picture quality, Fine and Standard.

The maximum resolution is 640 x 480 pixels and you can store 64 images at this resolution on the 4Mb of internal memory. At this resolution, although picture quality was not needle-sharp, the camera was good at picking out varying colours. Standard quality is 320 x 240, half of the resolution, and an impressive 130 pictures can be held in the memory. Transfer time for Fine images was slow, taking up to a minute to download, half that for a Standard quality image.

PCW Details

Price £399.99 (£340 ex VAT)

Contact 0181 450 9131
www.casio-usa.com

Good Points Good colours. A very impressive range of features.

Bad Points Lacklustre picture quality. Poor LCD.

Conclusion Spend a bit extra if you want images of a better quality.

★★★

Fuji DX-5



The new DX-5 Fujifilm could easily be mistaken for a conventional camera, being light, slim and defiantly Luddite in appearance. There is a viewfinder rather than an LCD so you can't look at photos until you transmit them to your PC, and just four option buttons on the back for when you want to change the flash settings, erase photos and set the compression ratio from fine to standard.

Transmitting the images from camera to PC is a relatively simple job. It takes about 20 seconds to download the photos from the camera, but this process is a massive drain on the batteries. I couldn't seem to load up more than a dozen images before it had seemingly sucked the life out of brand-new batteries. If this happens, don't do what I did and rush off for new duracells; simply switch your camera off for a few minutes and try again, and you can probably eke out another ten photos. This is a frustrating process that needs to be repeated a few times to get those last photos, and obviously the ideal is to hook the camera up to the mains.

An adapter is not sold with the DX-5 but it is worth investing in one, if only for preserving your sanity when you try and actually look at the photos you have taken.

PCW Details

Price £269.99 (£229 ex VAT)

Contact Fujifilm 0171 586 1477
www.fujifilm.com

Good Points Light. Simple. Good-quality images.

Bad Points A keen photographer will be frustrated at lack of features.

Conclusion Ideal starting point for novice photographer.

★★★

Fuji DX-7



A year ago Fuji hit the digital camera market with the DS-7. This has now been superseded by the DX-7, which has a lot of the same features. The resolution is still 640 x 480 pixels, and the images are still displayed on an LCD screen and stored on SmartMedia cards: a 2Mb card comes as standard. The same main controls work from the same dial on the top of the camera, and there are the same settings for the lens — macro or normal — and the same two aperture settings.

So is it the same camera in a more upmarket case? Well, no. The most noticeable differences are the viewfinder and the LCD. When the lens is set to normal mode, you use the viewfinder to line up the shot while the screen shows only the preferences you have set, not what you are looking at, which saves the battery. But when you press the shutter, the camera shows you the shot on the screen and lets you choose to save it to memory or to dump it. In macro mode you see what you have pointed the lens at.

When you get down to the finer details, there is a sharpness setting for either normal, hard or soft, and four white balance modes. Images are stored in Exif format, a Fuji standard that is based on JPEG.

PCW Details

Price £399.99 (£340 ex VAT)

Contact Fujifilm 0171 586 1477
www.fujifilm.com

Good Points An improvement on the already excellent DS-7.

Bad Points Menu system can be tricky to operate.

Conclusion A good camera for the price.

★★★

Kodak DC-50

It is an indication of how revolutionary the Kodak DC-50 was that, despite being released nearly two years ago, it is still one of the only digital cameras in the mid-priced market to include a zoom lens, equivalent to 37 to 111mm lens on a 35mm camera.

In some ways it is startling to see what's changed in those two years. There is no LCD display, which means you cannot edit out unsatisfactory photos on the hoof, which is surely one of the most attractive features of a digital camera. Similarly, it has a built-in memory of only 1Mb but it will take Type I or Type II PC Cards. The internal memory will only store seven photos at the lowest compression setting with a resolution of 756 x 504.

Like the zoom lens, the flat design of the Kodak DC series doesn't seem to have caught on. Despite the fact that the design enables a steady shot to be taken, the DC-50 seems a very bulky camera when compared to newer models. But the DC-50 is still ludicrously simple to use, and very stable to take photos with because of the chunky body.



PCW Details

Price £349.99 (£298 ex VAT)

Contact Kodak 0800 281487
www.kodak.com

Good Points Stable grip. Zoom options. Straightforward controls.

Bad Points Starting to show its age in terms of weight, size and function limitations.

Conclusion A former champ no longer punching its weight.

★★

Kodak DC-120

The DC-120 still offers a resolution that is unmatched by any other camera in Kodak's range. Given the moniker "Mega Pixel", it lives up to the name, offering a resolution of 1,280 x 960. The Economy resolution is the equivalent of most cameras' Fine standard, at 640 x 480. There is a drawback, of course, to this level of pixelation, namely the effect on the memory card. While there is internal memory of 2Mb, this is quickly eaten up by taking just two photos: you would need a massive memory card to take a dozen 1,280 x 960 photos. However, you can use Type I or Type II PC Cards.

Other manufacturers have been either reluctant or unable to produce cameras with some of the same features that make the DC-120 such a good buy. It has both a viewfinder and an LCD that can be turned off, thus saving battery power when necessary without effectively disabling the camera. And it is still one of the few models to be fitted with a zoom, the equivalent of a 38-114mm lens on a 35mm camera.

We are not particularly fond of this design — it looks like a prop from Star Trek. However, it does provide you with a steady grip for taking shots.



PCW Details

Price £599 (£510 ex VAT)

Contact Kodak 0800 281487
www.kodak.com

Good Points The zoom option and the high resolution.

Bad Points Being mistaken for a Trekkie.

Conclusion A classic.

★★★★

Minolta Dimâge V

The Dimâge V from Minolta is the first of the company's low-end digital cameras. The most surprising feature of this camera is the lens: swivel it through 180 degrees, detach it and connect it to a meter-long cable, and you can take pictures in crowds or around corners. Holding the lens in one hand and the camera in the other is tricky, but you can still see the image displayed on the 1.8in LCD screen.

The 2.7x zoom lens is the equivalent of a 34-92mm lens on a 35mm camera and there is also a macro mode. There are two levels of image compression and the resolution is 640 x 480 pixels. It stores images on flash memory cards. A 2Mb card is supplied as standard and you can store up to 40 images. The date and time are stored with the images and it has a built-in flash.

The Dimâge V comes with Adobe PhotoDeluxe 1.0 and downloading software. You can download pictures into any TWAIN-compliant application, but the downloading process is slow and cumbersome.



PCW Details

Price £599.99 (£510 ex VAT)

Contact Minolta 0171 586 1477
www.minolta.de/europe.html

Good Points Detachable lens.

Bad Points The downloading application is terrible.

Conclusion A good, middle-of-the-road camera, but you'll need patience.

★★★

Nikon Coolpix 300

The Coolpix 300 aims to break away from the norm and do something completely different. It is subtitled a PIA (personal imaging assistant) and its most obvious feature is the 2.5in touch-sensitive screen. You can use this to annotate images by jotting down handwritten notes or adding doodles using the stylus provided. In other words, it is like a cross between a camera and a US Robotics PalmPilot. There is an audio facility, so you can record up to 17 minutes of sounds, and a video-out port, so you can show presentations on a TV or record to video from the camera.

The Coolpix 300 isn't bad for a camera with a resolution of 640 x 480 pixels. The colours were captured accurately and the image was quite crisp. Setting up the camera was tricky at first, as the menu system used is complex.

You can download images using a serial cable, or you can opt to use a SCSI interface. Setting the camera to the right options, while seemingly simple, was fraught with difficulty. In fact, the menu puts you right off what is otherwise a very good camera.



PCW Details

Price RRP £749.65 (£638 ex VAT). Estimated street price £645.08 (£549 ex VAT)

Contact Nikon View 0800 230222
www.klt.co.jp/nikon

Good Points Good image quality. Audio facilities.

Bad Points The menu is hard to get used to.

Conclusion A very versatile and good-quality camera.

★★★★

Epson PhotoPC 600

Personal
Computer
World
**Highly
Commended**

The PhotoPC 600 has been designed to fit in with Epson's range of digital-imaging products, including scanners and photo printers. In fact, the camera can download directly to Epson's PhotoStylus inkjet.



The spec is higher than its predecessor. It has a maximum resolution of 1,024 x 768 pixels, with normal or low compression, and a lower resolution of 640 x 480 if you want rough shots that don't take up much memory. There are numerous modes for the lens, including macro, panoramic and digital zoom up to 3x, and a function which lets you take nine shots in rapid succession for capturing action, which can be played back as an AVI file, all making it a very versatile camera. You can even take pictures in either black-and-white or colour.

The PhotoPC 600 has a large internal memory which can be expanded using the 4Mb or 15Mb CompactFlash cards. These aren't cheap, but the 4Mb of internal memory can store 48 images at 640 x 480 pixels, or 16 at the maximum resolution of 1,024 x 768 pixels. There is a video-out socket so you can play back your images on a TV or record them on videotape. As you can download information to the camera, you can even use it to play back a presentation.

PCW Details

Price RRP £781.38 (£665 ex VAT).
Expected street £700 (£595 ex VAT)

Contact Epson 0800 289622
www.epson.co.uk

Good Points Feature-packed.

Bad Points Zoom only works with a resolution of 640 x 480 pixels.

Conclusion A versatile camera with excellent picture quality.

★★★★

Sanyo Digicam

Personal
Computer
World
**Highly
Commended**

This camera is immensely photographer friendly: the control pad and on-screen menus are a joy to use. The four alkaline batteries are eaten up by the gorgeous polysilicon Thin Film Transfer (TFT) display. However as the Sanyo also scores over most of its contemporaries by having both a viewfinder and a display, you can save the batteries by just using the viewfinder. You can even add soundbites to individual photos — although one six-second clip takes up the equivalent memory of a standard-resolution photo. Try not to say anything too embarrassing, because you won't be able to wipe the sound off without erasing the photo as well. If you can't think of anything to say at the time, don't worry — you can always add the sound at a later date.



Most impressive is the "multi-shot" facility, sidestepping the problem that most digital cameras face when trying to take photos quickly one after the other. Most need a few seconds of grace while they write the image, and so miss out on whatever action might be going on in the meantime. The Digicam can take an impressive 16 photos in 1.6 or 3.2 seconds. These can then be replayed as AVI files, making them ideal for capturing sporting events.

PCW Details

Price £529 (£449.99 ex VAT)

Contact Sanyo 01923 477295
www.sanyo.co.uk

Good Points User-friendly functions. Attractive LCD.

Bad Points One of the heavier digital cameras, with all four batteries loaded in.

Conclusion Some inspired options make it one of the best buys.

★★★★

Sony DSC-F1

Personal
Computer
World
EDITOR'S

Those who think it impossible to lose one's heart to a machine obviously haven't used Sony's DSC-F1. Other PCW reviewers have fallen prey to its charms, so we've nothing to be bashful about. It has a maximum resolution of 640 x 480 pixels and comes with a 4Mb memory capacity. It looks and handles like a dream, but is it really that superior? Well, yes.



This camera can be linked up to a TV to show photos, and if your PC has IrDA infra-red you can transmit the photos direct to a notebook. The lens that rotates through 180 degrees is perfect for that vain shot of yourself, or for taking low-angled photos. There are Auto and Manual settings, the former taking care of everything, the latter letting you pick exposure, flash brightness, and a shutter speed that goes from 1/7.5 of a second for dark conditions, to 1/1000 for "action" photos. For "sporty" stuff there is an option to take nine successive photos at 1/15 second intervals. The DSC-F1 can play back photos, pick out portions of the image, and zoom in and enlarge them.

We tried to be revisionist, honest, but the DSC-F1 was just too much fun.

PCW Details

Price £546 (£464.68 ex VAT)

Contact Sony 0990 424424
www.sony.com

Good Points How long have you got?

Bad Points No viewfinder. Still rather expensive.

Conclusion It doesn't get much better than this.

★★★★★

Sony Mavica

The outstanding feature of this new model from Sony is that it takes floppy disks. While this means a bulkier camera, it also means no driver software, no leads and no downloading process. A dozen disks will set you back a fraction of the cost of a 2 or 4Mb flash card and are more durable. You open the JPEG files with the Photo Express application. Heaven.

Despite incorporating technology as retro as the floppy disk, Sony's sense of aesthetics hasn't let it down with this piece of kit. The chunky design fits the hand well, and while it's a shame there isn't a viewfinder, the 2.5in LCD provides sharp live images, while the on-screen controls are simple but extensive. The camera is powered by Sony's Info-Lithium battery and there is a timer on the LCD counting down battery life.

The disks can store 20 to 40 images depending on the complexity of the image and take only a few seconds longer than flash cards to write the image, although maximum resolution is no more than 640 x 480. It is in the picture quality, unfortunately, where the Mavica falls down. The Fine images are passable, but the Standard ones look as though they have been taken off a TV.



PCW Details

Price £449.99 (£382.97 ex VAT)

Contact Sony 0990 424424
www.sony.com

Good Points The triumphant return to form with the floppy.

Bad Points Images aren't up to scratch.

Conclusion If Sony can sort the picture quality, it should clean up.

★★★

Vivitar ViviCam 2500

Vivitar, the lens manufacturer, now has a range of digital cameras, starting with the 1000 series and going up to the 3000, at an astonishingly low price of £99. The 2500 sits in the middle and is intended as an entry-level camera aimed at happy-snappers.



It has a true resolution of just 320 x 240 which can be interpolated up to 640 x 480. Although the price is low, just £260, this is still quite a lot here for such a low-resolution camera. There is 2Mb of internal memory which cannot be expanded with memory cards. It has a self-timer, automatic flash and macro mode, and the most useful feature is an LCD to help you set up shots. In its favour is its ease of use: anyone can pick it up and start using it straight away — there is no way you'd be confused by the controls.

The bundled software is a utility called IMS camera. It is very basic but easy to use, and downloading images was painless. As the images produced by the camera are so small, there is probably little you could do to them anyway, so the lack of an Adobe PhotoDeluxe type of package is not so important. Overall, though, this is just another corner that seems to have been cut in order to keep the price down.

PCW Details

Price £259.99 (£221.19 ex VAT)

Contact Vivitar 01793 526211
www.vivitar.co.uk

Good Points Easy to use.

Bad Points Low resolution.

Conclusion There are better budget models.

★★

Vivitar ViviCam 3000

The ViviCam 3000 improves on the 2500 in terms of resolution. It has a maximum resolution of 1,000 x 800 pixels, but at just £350 it's quite low-priced. Pixels aren't



everything, though, and otherwise this camera is fairly low on features. It has an automatic flash, self-timer and macro mode, but this is about the sum of its functionality. There is only 0.5Mb of internal memory and although it does take optional memory cards these add considerably to the cost of the camera (a 2Mb card costs £90 and a 4Mb card £130).

The ViviCam 3000 comes with LivePix, a cheap-and-cheerful photo manipulation package, and PhotoVista Panorama for pasting photos together. The colours it captures are good, with the green coming out green and the blue being a reasonably good approximation of the real colour of the vase. But it was not as good at picking out details like the petals on the flowers and the stringy bits of the pumpkin. Overall, the 3000 is not as good as the higher-resolution cameras we have seen from Kodak, Epson and Canon.

PCW Details

Price £349.99 (£297.86 ex VAT)

Contact Vivitar 01793 526211
www.vivitar.co.uk

Good Points Cheap for a high-resolution camera.

Bad Points Have to buy additional memory. Images not crisp enough.

Conclusion A good budget buy.

★★★

How digital cameras work

In a conventional camera, light-sensitive film captures images and is used to store them after chemical development. In a digital camera, the image capture is performed by a charge-coupled device (CCD) which consists of a grid of light-sensitive elements.

Digital cameras are often described as having lenses with equivalent focal lengths to popular 35mm-camera lenses. In fact, most digital cameras feature lenses with focal lengths around 8mm; these provide equivalent coverage to a standard film camera because the imaging CCDs are so much smaller than a frame of 35mm film.

Each element converts light into a voltage proportional to the brightness, which is later converted into digital information which the PC can understand: the brighter the light, the higher the voltage, resulting in a brighter computer pixel. The more elements, the higher the resolution, and the greater the detail that can be captured. This grid of elements produces a colour bitmap file of the same resolution: typically, 640 x 480 pixels.

Digital cameras use flash memory to store their images. Flash memory is non-volatile, which means it can retain the image information regardless of battery condition. The greater the memory or compression used, the more images can be stored at any time. Higher-resolution or less compressed images occupy more memory. A camera may have fixed internal memory or offer the

flexibility of using removable memory cards.

Some digital cameras feature small, colour LCD screens for image composition, allowing you to view your images immediately and delete those which aren't required, thereby freeing up memory. The screens are impressive and confirm the immediacy of the format, but can be difficult to use in direct sunlight and drain batteries at a rate of knots. Some cameras offer both conventional optical viewfinders and LCD screens.

Once your images are taken you'll want to use them on your PC. Almost all digital cameras offer serial-cable links, transferring images in around 30 seconds. Memory cards can be removed and slotted into a suitable PC interface for much faster transfer. Some memory cards conform to the credit-card sized PC Card (PCMCIA) format which can slot straight into most notebook PCs. Adapters are often available, allowing you to use the smaller (and more common) memory cards in conventional PC Card slots. Many recent digital cameras also feature a composite video output for display on a TV or VCR.

The images themselves may be in a

Thanks for the memory



Pictured here in actual size is a 2Mb mini flash memory card. These removable cards are proving increasingly popular in digital cameras, and put the earlier credit-card sized (and much thicker) PC Cards to shame

proprietary format, requiring the manufacturer's supplied software for access, but most digital cameras compress and save their images in the industry-standard JPEG format, readable on almost every graphics package. JPEG offers variable compression levels where the higher the compression used, the smaller the file size but the poorer the quality. Most cameras offer two or three quality settings. A 640 x 480 pixel colour image measures under 1Mb uncompressed, which JPEG will be able to squeeze down around 20 times while retaining good quality.

Gordon Laing

Best of the rest

If none of the digital cameras we have reviewed seem to suit either your pocket or your needs, there are plenty more out there to try.

Starting at the budget end of the market there are quite a few cameras for under £300. The cheapest of all is the **Vivitar 1000**. While the two Vivitar models we have reviewed in this group test are fairly inexpensive, the 1000 comes in at a staggering £99 (inc VAT). As you might imagine, it's very basic; but with a resolution of just 480 x 320 pixels, it could be a good place to start. Slightly more expensive are the **Kodak DC-20**, at a street price of around £153, and the **Casio QV-11**, which has just replaced the QV-10a, going for around £140 on the street. The DC-20 is extremely basic, with just a viewfinder, no LCD, no macro facility and no flash, but you do have a choice of resolution: either 320 x 240 or 493 x 373 pixels. The Casio QV-11 has a colour LCD screen and a lens which rotates through 180 degrees, although the resolution is a lowly 320 x 240 pixels.

However, by the time you read this, you should be able to get your hands on another new entry-level product from **Casio**, the **QV-70**. Gone is the swivel lens, and in comes a viewfinder to complement the LCD screen, letting you save the batteries. It has an internal memory of 2Mb on which you will be able to store 96 images at its standard resolution of 480 x 240 pixels. It will also come with Adobe PhotoDeluxe for image manipulation.

At the middle of the range there is due to be another new **Casio** release, the **QV-700**.

This camera ups the ante by offering

screen, this time enlarged to 2.5in. It has clever features such as continuous shooting, which lets you take an image every second, and it lets you take four frames at 0.05-second intervals (useful for getting the right shot of a rowdy bunch of friends).

There's also the **Fuji DS-7**, which is similar to the DX-7 but without as many imaging options, and the **Sanyo DigiCam**, which doubtless you have seen advertised on TV. The DigiCam has a maximum resolution of 640 x 480 pixels, a viewfinder and an LCD screen, and can capture sequences of nine images at 0.1sec intervals, which it then plays back as an AVI file. It can record sound, too.

You could also look at the **Panasonic CoolShot**, a very small camera with a resolution of 640 x 480 pixels and an optional LCD screen which fixes on the side. It should set you back about £293 on the street. The **Nikon**



The Agfa ePhoto 1280 will have a maximum resolution of 1,280 x 960

pixels and will cost around £645. It will also have a 3X zoom and let you adjust the aperture and shutter speed. The **Olympus C-1400L** will cost more, with an RRP of £1,300. With that, however, you get a digital SLR with a 3X zoom, and a top resolution of 1,280 x 1,024 pixels. You are supplied with two 4Mb flash memory cards which can be put into a disk and so into a standard floppy drive for fast and convenient downloading.

Adele Dyer



Coolpix 100, meanwhile, has the advantage of having a PC Card built into it, so images can be downloaded directly to a notebook without having to use a slow serial connection. One more mid-range option is the **Sony Mavica DC-7**, which is essentially the same camera as the DC-5 but with a zoom lens.

If you want a camera with a higher than average resolution, there are several options. The **Canon**

PowerShot 600 has been around for a while, and with resolutions ranging from 320 x 240 to a maximum 832 x 608 pixels, three levels of compression and a PC Card slot, it still holds its own against more recent cameras. Meanwhile, Kodak has just released a new top-of-the-range budget camera with a top resolution of 1,160 x 864 pixels and a 2X-zoom lens. The most remarkable thing about this camera, however, is the excellent quality of the images it produces (see "First Impressions", PCW December 97).

Agfa and Olympus have both announced new products aimed at those who need a bit more from their digital camera.



Left The Agfa

ePhoto 307, showing its age but soon to be joined by the ePhoto 1280 with a max resolution of 1,280 x 960 pixels and a price of around £549 (ex VAT)

Above left The Canon PowerShot 600, one of the best higher-end cameras with a max resolution of 832 x 608 pixels, stores images directly on to a PC Card. Top right The Nikon E2N is designed for the pro and has a price tag to match. It takes standard 35mm camera lenses. Above The Kodak DC-20 is one of the cheapest digital cameras but it does a decent job



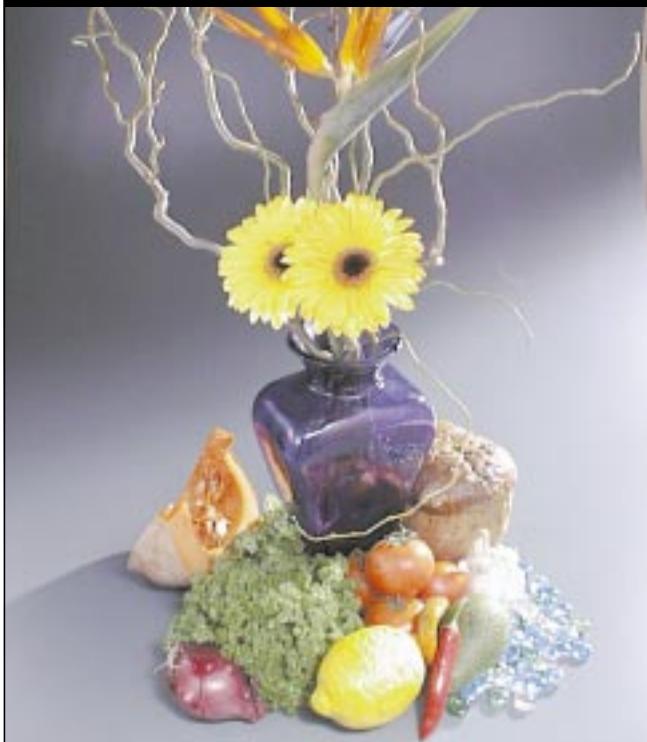
features never seen before on a budget Casio. It has a standard resolution of 640 x 480 pixels and it still has the trademark Casio 180-degree swivel lens and colour LCD

Canon PowerShot 350



This photo is taken using the PowerShot's resolution of 640 x 480 pixels; up to 47 such images can be squeezed in the memory. At £499 it's not one of the cheapest cameras we looked at, but the picture quality ranks it among the best.

Epson PhotoPC 600



At around £780 the PhotoPC is one of the more expensive cameras in the test, but it does have one of the highest resolutions of any of the cameras we saw. With a top setting of 1,024 x 768 pixels (seen here) it can store up to 16 photos in its 4Mb internal memory.

Fuji DX-7



The DS-7 is one of the older cameras on the market, but still takes a better picture at 640 x 480 pixels than some of the newer contenders. It has both standard and economy settings, and was one of the first cameras to take mini flash memory cards.

Kodak DC-120



There are over a million pixels on offer with the DC-120, boasting a 1,280 x 960 pixel resolution unmatched by similarly-priced cameras. At £599 it's not cheap, but few other models offer the same level of definition and quality; Kodak's newer DC-210 boasts the same.

Nikon E2N



Nikon's E2N SLR digital camera can use any lens from its industry-standard 35mm range. The 1,280 x 1,000 pixel resolution, Nikon's pedigree and the E2N's price tag should result in excellent picture quality, but we were disappointed. You're paying more for flexibility.

Vivitar ViviCam 2500



A simple camera, the 2500 is aimed at entry-level or online users with its resolution of only 320 x 240 pixels. It is possible to double this number, but the image here is at 320 x 240. At only £259.99 (inc VAT), the 2500 is one of the cheapest models worth a look.

Editor's Choice

A year ago, the winner in our digital camera group test was the Kodak DC-50. Kodak's camera has since been overtaken by the competition, which is not surprising when you consider that it is now two years old. The DC-50, with its zoom lens, was favoured because it was an example of a digital camera being able to replicate the best features of a conventional camera.

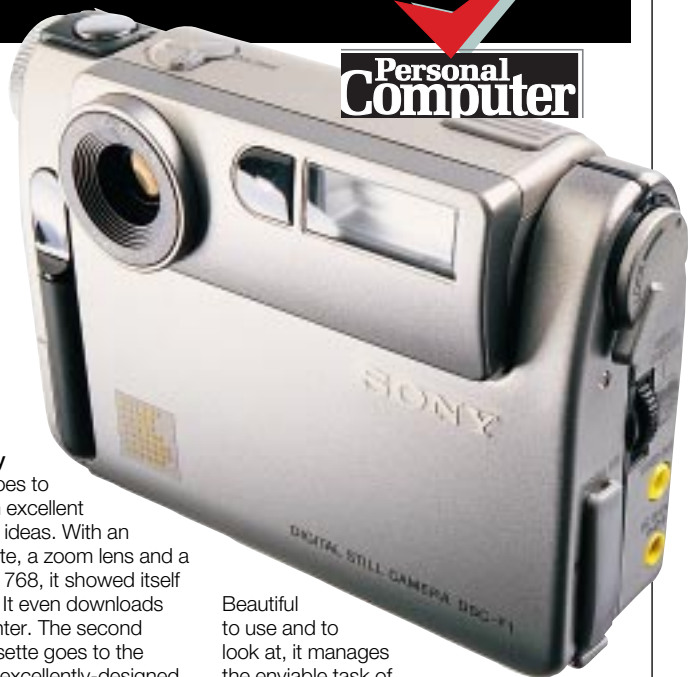
The cameras that have won the prizes this year are examples of the potential of digital photography. They not only take excellent-quality photos, but allow the user a startling level of image manipulation in the cameras themselves, before the images are even downloaded into a PC. It is now possible to switch between colour or black-and-white photos, record the photos onto floppies, take multiple shots in just over a second, detach lenses from the camera to get whatever angle you like, or add notes and comments to each shot as it is taken. We haven't seen a single camera that does *all* of that yet, but the best ones we have looked at are leading the way in the photographic revolution.

Before we begin handing out the gongs, an honourable mention should go to the Nikon Coolpix 300. The Coolpix is an adventurous attempt to change the way we use digital cameras, and if it wasn't such a pain to integrate with the PC it would have scooped one of our Highly Commended

awards. Similar mention should go to Sony's Mavica, for rehabilitating the floppy disk. It too would have picked up a gong had it not fallen down on image quality. Look out for the Mavica MVC-FD7, which is basically the same camera but with a 10X optical zoom. For sheer gadgetry the Minolta Dimâge V also deserves a mention, for its spy-camera detachable lens.

The first of our **Highly Commended** awards goes to the **Epson PhotoPC**, an excellent camera that bristles with ideas. With an option for black-and-white, a zoom lens and a top resolution of 1,024 x 768, it showed itself to be a solid all-rounder. It even downloads straight into an inkjet printer. The second **Highly Commended** rosette goes to the **Sanyo Digicam**. It is an excellently-designed camera that performs well, and even though it has fewer options than the Coolpix 300, it doesn't overreach itself. It is simplicity itself to use, and the multishot and sound functions make it extremely versatile.

Which leads us onto the **Editor's Choice**. The top award goes to the **Sony DSC-F1**.



Beautiful to use and to look at, it manages the enviable task of offering a wide range of functions while remaining easy to use.

Just as importantly, the DSC-F1's appearance and gadgetry makes people who wouldn't usually look twice at a camera want to start taking photographs with it, which can only be a good thing.



Table of Features















							
Manufacturer	Canon	Casio	Epson	Fuji	Fuji	Kodak	Kodak
Model	PowerShot 350	QV-200	PhotoPC 600	DX7	DX-5	DC-50	DC-120
Price (inc VAT) RRP	£586.33	£399.99	£781.38	£399.99	£399.99	£349.99	£599
Price (ex VAT) RRP	£499	£340.42	£665	£340.42	£340.42	£297.86	£509.79
Tel no	0121 680 8062	0181 450 9131	01442 261 144	0171 586 1477	0171 586 5900	0800 281487	0800 281487
URL	www.canon.co.uk	www.casio.co.uk	www.epson.co.uk	www.fujifilm.co.uk	www.fujifilm.co.uk	www.kodak.com	www.kodak.com
Internal memory	None	4Mb	4Mb	None	2 or 4Mb	1Mb	2Mb
LCD	●	●	●	●	●	●	●
Viewfinder	○	○	●	●	○	●	●
Flash	●	○	●	●	●	●	●
Max resolution	640 x 480	640x480	1,024 x 768	640 x 480	640 x 480	756 x 504	1,280 x 960
No. of images stored	11	64	15	30	30	7	7
Other resolutions	n/a	320 x 240	1,024 x 384 640 x 480	N/A	N/A	N/A	N/A
No. of images stored	47	192	32 & 48	60	60	N/A	N/A
Removable memory	2Mb included	○	●	2Mb included	●	●	●
Native file format	JPEG	JPEG	JPEG	JPEG	JPEG	KDC	KDC
Focal length of lens	42mm	38mm	36mm	38mm	38mm	37-111mm	38-114mm
Audio recording	○	○	○	○	○	○	○
Batteries	4 x AA	4 x AA	4 x AA	4 x AA	4 x AA	4 x AA	4 x AA
Rechargeable battery	●	○	○	●	○	○	○
Power adaptor	○	●	○	○	○	○	○
Connection to PC	●	●	●	●	●	●	●
Connection interface	Serial	Serial	Serial/Mac	Serial/Mac/PC Card	Serial/Mac/PC	Serial/Mac/PC	Serial/Mac/PC
Video out	○	●	●	●	●	○	○
Bundled software	PhotoImpact 3.0SE Stitch, Time Tunnel	QV-Link	PhotoEnhancer	PhotoEnhancer	PhotoEnhancer	PhotoEnhancer	PhotoEnhancer



Table of Features

							
Manufacturer	Minolta	Nikon	Sanyo	Sony	Sony	Vivitar	Vivitar
Model	Dimage V	Coolpix 300	Digicam	MVC-FD5	DSC-F1	ViviCam 3000	ViviCam 2500
Price (inc VAT) RRP	£599.99	£749.65	£528.74	£449.99	££546	£349.99	£259
Price (ex VAT) RRP	£510.63	£638	£449.99	£382.97	£464.68	£297.86	£220.43
Tel no	0171 586 1477	0800 230 222	01923 477295	0990 424424	0990 424424	01793 526211	01793 526211
URL	www.minolta.co.uk	www.kit.co.jp/nikon	www.sanyo.co.uk	www.sony.com	www.sony.com	www.vivitar.co.uk	www.vivitar.co.uk
Internal memory	None	4Mb	4Mb	1.44Mb floppy	4Mb	512K	2Mb
LCD	●	●	●	●	●	○	●
Viewfinder	○	●	○	○	○	●	○
Flash	●	●	●	●	●	●	●
Max resolution	640 x 480	640 x 480	640 x 480	640 x 480	640 x 480	1,000 x 800	320 x 240
No. of images stored	16	66	60	20	108	10	64
Other resolutions	N/A	N/A	320 x 240	N/A	N/A	480 x 320	N/A
No. of images stored	40	132	120	40	30 to 108	20	n/a
Removable memory	2Mb included, ●	○	○	Floppy	○	●	○
Native file format	JPEG	JPEG	JPEG	JPEG	JPEG	Wavelet	JPEG
Focal length of lens	34-92mm	45mm	36mm	38mm	35mm	50mm	52mm
Audio recording	○	●	●	○	○	●	○
Batteries	4 x AA	4 x AA	4 x AA	Lithium	Lithium Ion	6 x AA	4 x AA
Rechargeable battery	○	○	○	●	●	○	○
Power adaptor	●	○	○	●	●	○	●
Connection to PC	●	●	●	○	●	●	○
Connection interface	Serial/Mac/PC Card	Serial/SCSI	Serial/Mac	N/A	Serial	Serial	Serial
Video out	No	●	●	No	● NTSC	No	● NTSC
Bundled software	PhotoDeluxe	Nikon View	MGI Photosuite	Photo Express	PhotoStudio	LivePix	IMS Camera

Key: ● Yes ○ No

Efficiency **drive**

The so-called information superhighway is becoming a B-road, handling a level of demand for which it was never designed. Now, the race is on to devise a new technology to drive the internet into the next century. Toby Howard reports.

Downloading software from the web the other day, it was about the time that America was waking up and my browser was beginning to slumber. Returning to my PC after a 20-minute tea break I found the following message: "1 byte read".

So much for the information superhighway. Despite its growing reputation as the "World Wide Wait", the internet remains poised to play a central role in our futures. Soon, our workplaces, homes, domestic appliances and perhaps even our bodies will be linked into a global hypernet. It's generally accepted that internet traffic is growing by over 400 percent every year and the race is on to upgrade it to cope with the demands of the next century, before it grinds to a halt.

It's over a year since Bill Clinton announced the Next Generation Internet (NGI) programme <www.ngi.gov>, funded to the tune of \$300m by the US government over three years, with commercial backing. NGI is an ambitious project, designed to take the internet into the next century with room for expansion. The technology of the internet was designed to cope with thousands and is now straining under the burden of serving millions, with demand for bulk data transfer at levels unimagined by the original designers. Using a mix of an upgraded physical network and new software, NGI aims to connect 100 sites at speeds 100 times faster, and to link a few "prestige" sites at more than 1,000 times today's speed.

A key component of NGI is a replacement for the mechanism by which data is moved around the internet. Apart from utilising physically faster network cabling, the software used to marshall the data is in need of an overhaul. As the internet grows, the current protocols for information exchange are finding it hard to keep up.

The internet is a collection of networks, only a few of which actually have any direct physical connection with one another. If different types of computer connected to various types of network are to have any chance of communicating, there must be some agreed standards. In internet terms there are two protocols which work together to achieve this and they're collectively known as TCP/IP. TCP takes the data that one computer wishes to transmit to another and splits it up into small, manageable chunks. It arranges to send each chunk to the destination, making sure the chunks arrive in the right order for correct reassembly and that any which go missing are sent again. The IP handles the business of ensuring that an individual chunk is sent from its source to its destination.



“The internet was designed to cope with thousands, and is now straining under the burden of serving millions”

As demands on the net increase, the current version of IP is not going to be up to the job for very much longer; for one thing, it's running out of addresses. Currently, internet addresses are 32 bits (four bytes) long, and although this allows for millions of addresses, it's estimated that these will all have been exhausted by around 2005. It's becoming more likely that internet protocols will be used for controlling electronic gadgetry in the workplace and at home. Every item, from basketball-court lighting to your garage door, will need its own internet address.

This and other shortcomings in IP are being addressed by a replacement called IPv6. This offers 10³⁹ unique addresses. It provides built-in encryption at a low level, preventing snoopers from eavesdropping on sensitive data, and a range of technical improvements that will make efficient use of the existing network infrastructure. The ideas in IPv6 are now being tested in a collaborative project covering North America, Europe and Japan, known as the "6bone" network <www.6bone.net>.

With America leading the way, and a separate university "Internet 2" initiative <www.internet2.edu>, where does that leave Europe? There's an EC-funded venture called "Trans European Network interconnect at 34Mbps", or Ten-34, operated by Dante, a non-profit

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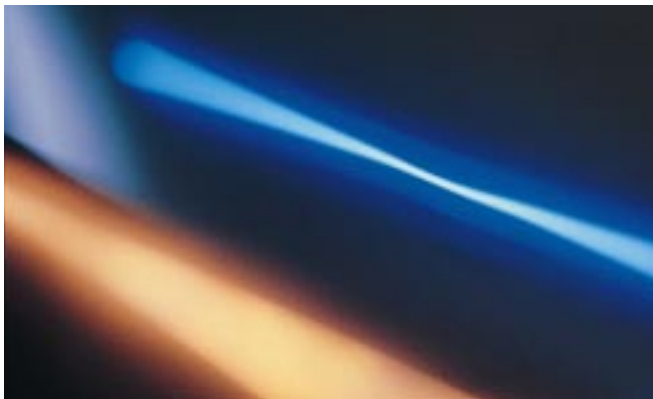
company based in Cambridge <www.dante.com>. The scale and goals of Ten-34 are more modest than its US counterparts, but include plans for data rates of up to 155Mbps — about a hundred times faster than today's internet. That's more than enough to support high-resolution video-conferencing, for instance.

What will people do with the speed and power of the streamlined internet? One of the goals of the US initiative is to figure this out and come up with "revolutionary applications". Already on the agenda is the establishment

of "virtual collaboraties": shared electronic spaces where scientists can co-operate on huge research projects which would be impossible for a single physical institution to host. As well as nationwide crisis and disaster management, digital libraries and tele-medicine, the days of numbed students sitting in dusty lecture theatres may finally be over, with the advent of an internet "Televersity".

Researchers are working to modernise the net, but until the technology is in place, all we can do is get up early and hit the web before America stirs. ■

The thin **blue** line



Tim Frost looks into the future of optical storage. Increased capacity made possible by the blue laser beam could greatly expand the silver disc market.

The race is now on to perfect the blue laser, in a form which can be used inside an optical disc layer. They have a smaller wavelength, so the narrower beam can read smaller dots. But blue lasers are proving a difficult nut to crack.

They already exist for big systems and it is likely

that they will be used extensively in the near future for making the masters for DVD discs. But there we are looking at special laser-beam recorders the size of a wardrobe, which cost thousands and need a super-clean, vibration-free environment in which to work properly. The challenge now is to make the blue laser in a form that can fit into a PC-ROM drive and be affordable.

Solid-state blue lasers work in the laboratory but not for long. The amount of power the laser needs to produce is a lot for a device hardly bigger than a match-head. Getting the laser to fire out of one end while not simultaneously punching a hole out of its rear end has been creating headaches for the developers. In the past year, techniques have moved forward and the big manufacturers are now predicting that "beyond-DVD" discs and drives should be a reality at the start of the next century. The current target is to use blue lasers for discs which contain 15Gb per layer. Using the current DVD type of disc design, that could automatically translate into a double-sided 30Gb disc, or a dual-layer disc that could store 25Gb on a single side.

From a pure PC datafile point of view, this is an unnecessarily large capacity when most of us are producing documents that can fit onto a single floppy. The main opportunity is the ability to store multimedia, video and audio. Even though the desktop PC-based mass storage market is big, moving optical disc into the video recorder/player market would create a massive industry for the 5in silver disc. ■

Until recently, the optical disc was a niche product used by specialists in the print world and in video and sound recording applications. The returns were small, so manufacturers were not able to justify the cost of research to extend the boundaries of optical storage. But the impact of CD-R changed all that.

Writing files or recording audio onto a gold disc, rather than on tape or hard disk, is becoming a mass market activity. What makes all the difference is the ability of manufacturers to make discs and drives with much closer tolerances than was possible in the early eighties. Thus, the data pits can be made smaller, be put closer together and need less error correction. But the only real development has been the introduction of a new laser for the player which produces a marginally smaller wavelength of red light: 635nm instead of CD's 650nm.

The increase in capacity, though, has been relatively small. DVD's developers are working on plans to increase optical storage capacity over the next ten years. The only way to do that is to rethink the type of laser that has to be used to create and read the discs.

The laser is critical to development because the wavelength of the drive's laser light limits the size of the pit that can be read from the disc. Put a future-generation disc, with its pit sizes of 0.1 micrometre, in today's CD-ROM drives and the beam from its laser would seem more like a floodlight covering several tracks instead of a spotlight focusing on a single dot.

Hands On Contents

■ *Hands On* is the place where readers can contribute to *PCW* and, as always, we'll pay for anything we use. Macros, sections of code, and hints and tips will be rewarded with a £20 book or record token (please say which you would prefer) and we will pay hard cash for longer, more involved pieces. Please include relevant screenshots in .GIF format. All submissions should be emailed to the author of the appropriate column or snailmailed to Hands On, Personal Computer World Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on 0171 316 9313. We are constantly working to improve the contents of Hands On. If you have any suggestions, send them to the Editor at the address above, or email them to pcw@vnu.co.uk.

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Dealing with **databases**

In part II of his Delphi tutorial, Tim Anderson examines the program's abilities as a data management tool and gets you started on building your own database applications.

Delphi is a great all-purpose development tool, but it is particularly strong for database work and can handle anything from a simple address book to a large multi-user system. This workshop explains how Delphi manages data and will get you started with building your own database applications.

A quick-start Delphi database

Try the following example to see how Delphi deals with data.

1. When Delphi is installed, an example Paradox database called DBDEMOS is installed with it. If you run the BDE configuration or administration utility, you should find it listed. DBDEMOS is called an Alias. What that means is that instead of referring to the exact location of the data files in your application, you can use the

name DBDEMOS instead. Another advantage is that you can configure the way the BDE accesses this particular database just once. Use of an alias is not compulsory, but it does simplify data access. This example uses DBDEMOS, so it is a good idea to check that it is installed (Fig 1).

2. Start a new Delphi project. Place a

DataSource and a Table component on a form. Select the Table component and set its DatabaseName property to DBDEMOS and its TableName to CUSTOMER.DB.

Now select the DataSource and set its DataSet property to Table1.

3. Place a DBGrid on the form and set its DataSource property to DataSource1.

4. Select the Table component and set its Active property to True. All going well, the grid fills with data, even at design time.

5. Place a DBNavigator control on the form and set its DataSource property to DataSource1.

• *Tip: Set the Align property of the DBNavigator to Bottom. When the user resizes the form, the navigator will automatically resize itself to fit neatly along the bottom edge.*

6. Run the application. You can scroll up and down the grid to view all the records in the table. You can use the Insert Record button on the navigator control to insert a new record, and the

Code for the search facility

```
procedure TForm1.Button1Click(Sender: TObject);
var
  sSearchVal: string;
begin
  sSearchVal := InputBox('Search', 'Enter a company name', '');
  Table1.SetKey;
  if sSearchVal <> '' then Table1.FindNearest([sSearchVal]);
end;
```

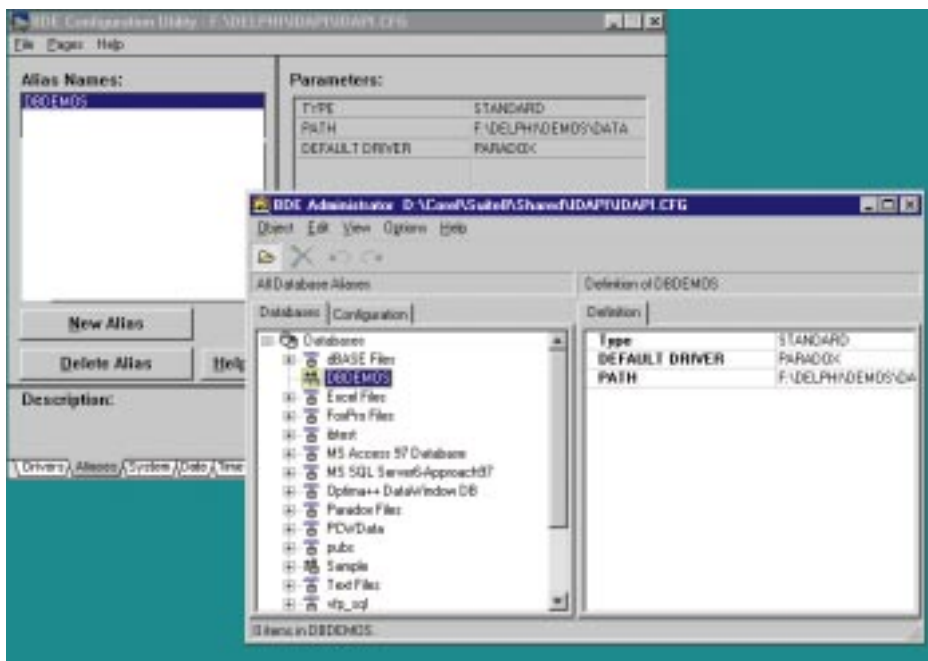


Fig 1 The rear window shows the BDE configuration utility for Delphi 1.0, while the front window is for Delphi 3.0. In both cases there is an alias called DBDEMOS

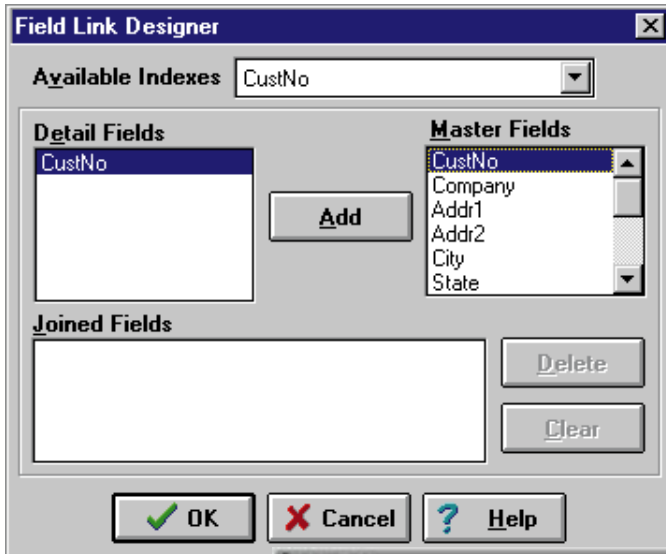


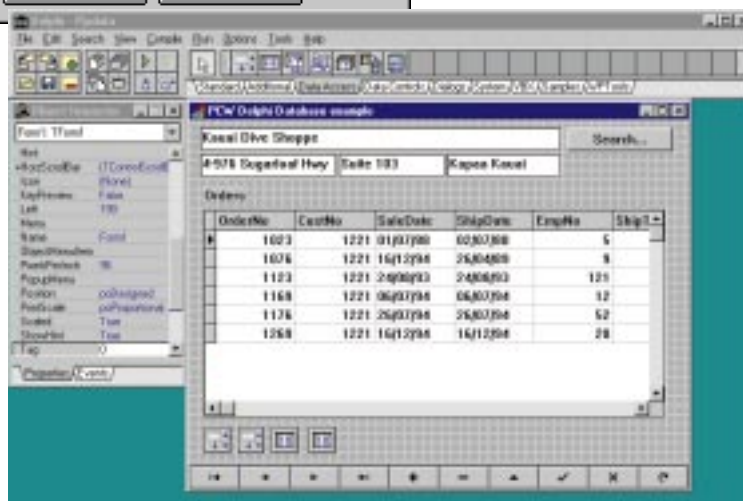
Fig 2 (left) Use the Field Link designer to set up a master-detail relationship. In this, the CustNo field links the Customer and Orders tables **Fig 3 (below)** The database includes a master-detail relationship. For each customer, the associated orders are displayed in the grid

TableName to ORDERS.DB.

3. Table2 is the detail table. In this next step, it is linked to the master table of customers. Set the MasterSource property to DataSource1. Select the MasterFields property, and click the three dots to open the Field Link Designer. Under Available Indexes choose CustNo. Select the CustNo field in both left and right field lists, and click Add. This operation tells Delphi to look up the orders for each customer based on the value of the CustNo field in each table.

4. Currently, the DBGrid points to the Customer table. Change its DataSource property to DataSource2 so that it points to the Orders table instead.

Now add several DBEdit controls above the grid and set their DataSource property to DataSource1. Set the DataField property of each DBEdit to a suitable field, such as Company, Addr1 and City. **Fig 3** shows a possible design for the form. Make sure the Active property of the Table components is set to True and run the application.



Post Edit button to save it. You can use the Delete Record button to remove a record — not bad for an instant database application.

• *Tip: Set the ShowHint property of the form to True. When you hover the mouse over the DBNavigator buttons at runtime, a hint tells you what each button does.*

7. The records are currently unsorted. To sort the records by Company, select the Table component and set its IndexName property to ByCompany. Now the records in the grid are sorted.

8. Finally, a glaring omission in the application is the lack of a search facility. Pop a button on the form, double-click to open the code editor, and enter the code for the search facility (see opposite page).

• *Tip: InputBox is a handy function when you need a quick way to get a search value from the user. Select the word InputBox in your code, press F1 to open online help, and see what the parameters do.*

This routine will only work if the table's IndexName property has been set. Delphi will look for a match in this index. Note the square brackets around the search variable — needed because FindNearest accepts an array parameter.

Dealing with master-detail data

You can easily enhance the example above to deal with a master-detail relationship (**Fig 2**). Here is how it works.

1. Add a second DataSource and Table

component. Set the DataSet property of DataSource2 to Table2.

2. Select the Table2 component and set its DatabaseName to DBDEMOS. Then set its

When you are starting with Delphi, the Table component used in the above example is the quickest, easiest way to display data. Surprisingly, many Delphi

Other database components

Defining your own database

Demonstration databases are all very well, but you will soon want to use your own data. To define your own tables, run the Database Desktop (a separate application that gets installed with Delphi) and choose File, New Table. When asked to select a table type, choose Paradox. The Create Table dialog opens, where you enter field definitions that define how data is stored. It is essential to do a good job at this stage, otherwise your application will never work well. Here are some tips:

- Include a unique identifier for each record. This is essential when you want to link several tables together, as with books and authors. An obvious technique is to use an auto-increment field for this, but beware: in most versions of Paradox this is not safe, as the value may change if the table is rebuilt. Most developers generate their own unique ID value. Mark this as the Primary Key by putting it at the top of the field list and double-clicking the Key column so an asterisk appears.
- Index other fields that you are likely to use for searching or sorting. Because Paradox uses the Key column for the primary key, other indexes should be defined as secondary indexes. Ensure all indexes are marked as maintained.
- Take full advantage of the Paradox facilities: for required fields or other validity checks for example. It is safer and easier to let the BDE handle validity checks, than to do so in your code. For instance, someone may open the table using Paradox rather than your application. In this case, rules you have defined in the table structure dialog will still hold, but those defined in your application will not.

How Delphi manages data

Delphi is a Borland product and Borland is the company which developed the Paradox database manager, first for DOS and later for Windows. Paradox is now marketed by Corel but the grunt-work of data access in Paradox is still handled by Borland code.

Borland has a couple of other database products: dBase and InterBase. Like Paradox, dBase is a desktop database designed for standalone use or for small networks of no more than a dozen or so users. The format of the data files is different and you will notice that Paradox files have a .DB extension, while dBase files end with .DBF. Borland decided to combine the code for dBase and Paradox, so that one low-level component could handle data in either format. This code, actually a set of dynamic link libraries, is called the BDE (Borland Database Engine). When Delphi was created, it made sense to include the same code there, as well. That means Delphi has native access to dBase and Paradox data using exactly the same code libraries as the full products. The Database Desktop, bundled with Delphi, is actually a cut-down version of Paradox.

Borland's InterBase is a different kind of product. It is a client-server database manager. In a dBase or Paradox system, each machine on the network runs its own data management code, accessing shared files on a central server. In a client-server system, the data management code runs on the server and the client machines run applications which despatch query requests and then receive the results. The advantage of client-server is partly that the server database can manage the data more intelligently, and partly that network traffic is reduced because only the query and its results need to be passed

back and forth. The result is that InterBase and other server databases, like Oracle and SQL Server, can handle many more users and manage databases beyond the capacity of Paradox or dBase. For maximum flexibility the BDE can handle these server databases via plug-in drivers. You can also access databases through Microsoft's standard for database drivers, ODBC. Overall, the BDE can handle three kinds of database:

1. Paradox or dBase natively.
2. InterBase and other server database via native drivers.
3. Any ODBC database.

To manage all these combinations you will find a utility called Database Engine Configuration in Delphi 1, or BDE Administrator in Delphi 3. The latest BDE can also handle Microsoft Access databases, but

only if they are in Access 95 format.

• *Tip: The BDE works best with dBase, Paradox, or its own native drivers. Use ODBC or Access data only as a last resort. Use Paradox rather than dBase, unless you have a reason to prefer the dBase format. Paradox data files have useful additional features.*

You do not have to use the BDE with Delphi. Although it is powerful, the database engine is large and memory hungry. For small databases, using Delphi's low-level file functions is more work to program but fast and efficient.

There are alternative third-party database libraries for handling dBase or FoxPro data, or for using ODBC or Access databases without going through the BDE. These solve compatibility problems, are smaller and often perform better than Borland's engine.

developers hardly ever use it. The reason is that you seldom want to view a whole table at once; more often, only a small subset of the database is required. Table components can perform badly on large databases.

The other factor is what happens when you need to scale your application up to a server database. In this case, you need an easy way to query and update the data using SQL (Structured Query Language), the common language of server database managers. Delphi has a Query component for exactly this purpose. You can use Query components on Paradox and dBase data as well, so there is no reason why it should not

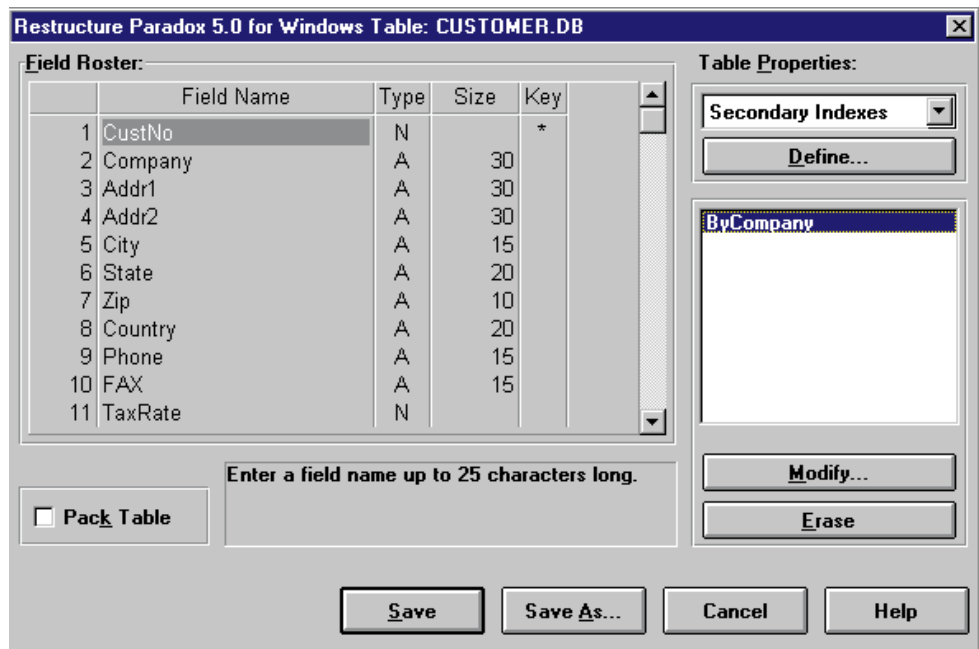
form the basis of all your database applications. It is a little harder to use, though, since you must be familiar with SQL.

Delphi also has a Database component but this is not necessary for simple apps. Internally, Delphi uses a default Database object instead. It is useful for systems where you need to log on with a user name and password, or if you are using a server database and want to use explicit sessions and transactions to ensure data integrity.

Another important database component, in Delphi 2.0 and higher, is the Data Module. This is invaluable if your application has more than one form: instead of putting data components on every form, you can

add them to a single data module. Each form then links to the data module by referencing it in the Uses clause of its unit. This is both simpler and more secure than having data components dotted all over your application.

■ *The code for the database example is on our cover CD-ROM, in the file DELPHI2.ZIP.*



The dialog for defining or restructuring a database table. It is part of the Database Desktop, a powerful interactive tool for managing data

PCW Contact

Delphi queries are regularly tackled in *Hands On Visual Programming*. You can contact **Tim Anderson** with your queries and tips at the usual PCW address (see page 12) or at visual@pcw.vnu.co.uk



Server Side Story

Nigel Whitfield answers a query on Server Side Includes, enabling you to replace parts of your web page with other information. But first, he comments on plans to net-connect all UK schools.

So, with the help of Bill Gates, every school in the country is to be connected to the internet. And almost unanimously, this has been hailed as a "good thing". The internet is, after all, a good thing, so giving everyone access to it from school must be as well, mustn't it?

Perhaps. But there's also a danger that, rather than giving everyone equality of access, making the net available in every school will actually increase the divide between different classes of pupil. Rubbish, you might say; and if all it's used for is a research tool, then there's some merit in that comment.

After all, those who don't have a computer, or lack net access at home, can always visit a library to look things up, or rely on the old family encyclopaedia, can't they? But what happens when the net ceases to be just a tool and is an accepted part of education, as some would like to see it? When the object of the exercise becomes not "Find me ten useful facts

about life in Uruguay" but "Find me ten web sites about Uruguay", all those whose access is restricted to their time at school will find themselves at a disadvantage compared to children from families with access at home, where they can search out new sites at their leisure.

There are some solutions, of course. After-school clubs will allow some children access to the computers at school that they didn't get to use during the day, and placing terminals in libraries will help as well.

What's really needed, however, if acceptance of the internet is to become anything more than another divide between the haves and the have-nots, is for access to be simple, for the "internet appliance" to become reality, cheaply and easily. It's no good to say that a computer is cheap, and that a net connection is only ten pounds a month when that's still far more money than many people can afford.

If the internet really is to become pervasive, in schools as well as homes, it needs to be cheaper and easier to access.

Forget Windows 95, and the combined browser and desktop of IE4. What's needed is a leap as significant as the arrival of the first Mac into the DOS-based world of the eighties, at a price that's comparable to a video recorder and just about as simple to use.

Only when people can rent a net appliance as easily and cheaply as they can a television set, will the internet really be a tool that we can wholeheartedly welcome into schools. Of course, putting every school on the internet is a start, and it will doubtless prove to be a valuable resource for many people. But it's vitally important to keep a sense of proportion and remember that it's not an unqualified advantage to both teachers and pupils, nor necessarily the best use of funds.

Rather than rushing headlong towards the utopian view of the net shared by many users, perhaps it's better that those of us who use it already think about what we're doing and the effect it will have on all parts of society, lest we create a divided dystopia.

Platform tickets with Server Side Includes

Most web pages that people create tend to be static, or to rely on multimedia and fancy add-ins to make them look more attractive to people. While that's all very useful, what about including information that will depend on who's accessing your site, or other information that changes from time to time.

As one of the questions this month shows (page 250), it's fairly easy to add to your web site the time a page was changed, but the Server Side Include (SSI) mechanism (also known as server parsed HTML) can do more than that: you can create pages that might include a reference to where someone's connected from, or the type of computer they're using, or even present a different menu completely, for some types of user. A word of warning: While SSI pages can be very useful, they can also put an extra load on your server. As a result, it's common to tell the server only to look at pages with a particular extension, usually `shtml`.

At its simplest, you can use the technique to add a standard button bar to every page. Then, if you want to give your site a makeover, just change

the file that contains the button bar, and every page that uses it will look different. Commands are embedded in HTML comments, so you'll either need to edit your web pages manually, or use a web editor that allows you to put in comments. For example, the code:

```
<!--#include virtual="/common/buttons.html"-->
```

would insert the code contained in `/common/buttons.html` where the comment appeared in your web page. If you replace "virtual" with "file" then you can specify the exact location of a file anywhere on the server, rather than within the main web directories.

You can also display any of the information passed to the web server by the browser, or maintained internally, using the `echo` command to display a variable. For instance:

```
<!--#echo var="REMOTE_HOST"-->
```

will be replaced with the name of the computer that's accessing your web

page, so put it in the middle of a 'Hello and welcome' message for a personalised touch. There are a few other commands too; include `flastmod` and `fsize` which tell you the date last changed and size of a file, respectively. But one of the most useful is the `exec` command which our example uses to create a simple page that will display different information for Mac users.

Here's the basic code for the page (missing the HEAD portion):

```
<h1>Welcome to my test page</h1>
```



The "echo" command can help you personalise your site for the Mac (left)...

...and for Windows 95 PCs with a minimum of coding (right)



```
1 Your browser is <!--#echo var="HTTP_USER_AGENT"--><P>
   The next lines will change depending on which platform you're
   using<P>
2 <!--#exec cmd="/usr/local/etc/httpd/cgi-bin/platform_ticket"--><P>
   And now we're back to the rest of the file.
```

The first marked line simply displays the information returned by the user's browser, which is sent to the web server and stored at `HTTP_USER_AGENT`; the second line calls a program called "platform_ticket" which is a Perl script. Instead of saying "cmd=" you could say "virtual=" and specify the program as a name like "/cgi-bin/platform_ticket", but on some servers (we used Netscape FastTrack) you might not be able to access the files you need from within the script unless you give the full path to them. Don't forget you'll need to include code like this in a file ending in .shtml and enable Server Side Includes on your web server. That option may not be available if you simply have free space with your internet account.

The next thing to do is to create the different versions of the page that you want to display for Windows and Mac users, and save those sections in files called "win.inc" and "mac.inc" (or whatever you've referred to in your script). Finally, you'll need to write the actual script itself, which decides which file to send back to the browser:

```
#!/usr/local/bin/perl
# script to output a file based on the browser accessing a site
1 $browser = $ENV{'HTTP_USER_AGENT'} ;
2 if ( $browser =~ /mac/i ) {
3     open( INCLUDE, "mac.inc" ) ;
4 } else {
5     open( INCLUDE, "win.inc" ) ;
6 }
7 while( <INCLUDE> ) {
8     print $_ ;
9 }
10 close INCLUDE ;
```

1. First, we've saved the information into a new variable; not strictly necessary, but if you wanted to change the value, you could do so more safely. 2. This line checks to see if \$browser contains the string "mac", and the i on the end ensures that it's case insensitive. 3. If "mac" occurs in the \$browser variable, then the file mac.inc will be opened; INCLUDE is the "handle" given to the file so we can refer to it later. 4. To do more tests, change "else" to "elsif" and add more conditions here. 5. These next three lines read from the file that was opened, one line at a time, printing it out. 6. Finally, we close the file, and the job's done. So, with just a handful of lines of Perl, and a couple of comments in your web page, you can give people the feeling that they've visited a site that's a little more customised to their needs; and of course you can do more than just display pages based on their browser. For more information about Server Side Includes, visit twister.luton.ac.uk/Manual/ssi.html.

Questions & Answers

Q We've created an intranet based on a system running Netscape's FastTrack server. So that everyone knows when a page has been updated, we'd like the server to include information automatically. I've heard of Server Side Includes, but can't find much information about them. How do we do this?

A Server Side Includes, also referred to in the Netscape documentation as parsed html, are a way of telling the server to replace certain parts of a page with other information; if you decide to use this, you'll have to tell the server which pages you want it to parse. The usual way is to save pages with the extension **.shtml** and include commands within them, embedded in HTML comments, which allow you to add features such as the date a file was modified or the name of the system requesting the page, and so forth.

The panel on page 248 gives details of how you can use Server Side Includes to create pages that will depend on the type of computer being used to access them. However, if all you want is a simple date and time on the bottom of your pages, Netscape FastTrack server has a "page footer" feature that you can use to achieve the same result, without having to worry about server side includes.

To activate custom page footers, use the server manager, and click on the Content Management button in the top frame, then choose Document footer in the left pane, and you'll see a screen similar to the one displayed here. You can type the footer text that you want in the box, including the tag **:LASTMOD** for the last modification date of the file, and select the date format from the drop down menu.

When you've made your changes, click on OK, then choose the button marked Save and Apply, stop, then restart your web server. All your pages, unless you selected just a portion of the server, will now have a footer added automatically.

Q I am an AOL user and I want to know how I can connect to the IRC network. Do I need to configure my system specially?

A No, you don't need to do anything special if you have the latest version of the AOL software, although older versions



Netscape's FastTrack server can automatically add a timestamp to all your pages

won't work with programs that require a 32-bit winsock stack (the part of Windows that links you to the internet).

The best thing to do is to upgrade to the latest version of the AOL software (which you can do at keyword UPGRADE). If you have it already, the system will tell you when you try to download it again. When you've installed AOL, you'll find that in one of the AOL directories there's a file called **winsock.dll**; install your IRC program into the same directory (or alternatively, make sure that it's in the path) and then all you need to do to connect to IRC is to start AOL, then start your IRC program.

One of the best IRC programs to use is called mIRC; you can download it from www.mirc.co.uk or at keyword IRC on AOL, where you'll also find additional information about configuring your system.

Q For the purposes of web-page design, what safe assumptions can I make about resident fonts? Is there a standard set installed with Windows 3.1 and 95 and, if so, where can I learn what it is?

A First, don't forget Mac users! The best thing to do is to assume as little as possible about fonts, as different systems may have widely differing selections. The best bet is to stick to the core TrueType fonts, which includes Arial, Courier New and Times New Roman; Mac users who have installed Microsoft Office applications will almost certainly have these fonts available. Those who don't can download them (and others) from www.microsoft.com/truetype/fontpack/mac.htm.

If you really do want to use lots of fonts to create a specific look for your web site, the best bet may be to provide links to the Microsoft (or other) font pages from the front page of your site, so that those who want to will be able to download them and make sure that they see things as you really intend them.

Q I am using Internet Explorer 4 Final (Build 4.71.1712.6) and MS Dialup Networking 1.2 on Windows 95 4.00.950. When I want to browse the internet it won't dial automatically. I think the reason is because the Save Password checkbox is greyed out. I have tried reinstalling the connection several times following the help exactly, but to no avail. I have also tried using Netscape Communicator but, again, I still cannot check the checkbox.

A Windows doesn't think you're signed on to the system as a valid user. When you install networking, Windows 95 assumes that you need to log on before the system is secure. However, many people simply press the Escape key when they're asked for a password, and since everything else works properly, don't realise the importance of what they're doing.

When you start Windows, if you don't

Setting a blank password will stop Windows prompting for a user name



have a user created, give yourself a name and then leave the password blank. You'll be asked to confirm it, so leave the box blank again. Now, when you start the system, you won't be asked for a user name.

If you've already created a password and want to avoid having to say who you are each time you start the system, you need to log in properly when you start up, with the correct password (or create a new user, with no password, instead), open the control panels and choose Passwords, then set the password to be blank. You should be able to tell Dialup Networking to save the password, so you'll be able to start your computer and get on the internet, without having to remember anything more than where the power switch is.

Q I'm writing CGI scripts in Perl 5. As Perl and most scripts/libraries are freely available on the net, what's the position regarding copyright?

A Your scripts are your own intellectual property, and unless you decide to give them away, then there's nothing anyone else can do with them. But if you were to distribute, for example, a Perl-based online shopping system which used freely available libraries from the internet, you may find that the conditions of use of those libraries prohibit you from using them as part of your commercial product. After all, why should you sell something someone else wrote?

It's most unlikely that someone would

be able to steal your scripts, unless the security on your web server is more or less non-existent. If the scripts are kept in a script directory, it's hard for anyone to see them. All that's passed to the web browser is the results of running the script itself.

You should clearly mark your scripts with your name, and other information, anyway, including an indication of your copyright, and a clear prohibition on use without your permission, if you wish to restrict their use, though of course it can be very hard to prove that someone has used your script, since it can easily be modified to look very different (especially with a language as flexible as Perl).

Q I'd like to set up a dial-in PPP link to the Unix server in my office, so that I can connect to the internet that way, rather than paying to subscribe to an ISP. How do I allocate IP addresses to the link? One of the manuals says something about having to have a separate subnet; what's that, and how do I create one? Is it absolutely necessary?

A A subnet is a section of addresses in a range of TCP/IP network numbers that, when written in binary, has the top section of bits all the same. For instance, if you have a network of 256 addresses, you might use four bits to create subnets, giving you sixteen subnets, each capable of having fourteen machines on it (addresses with the

bottom bits all either 1 or 0 aren't used).

By putting your PPP link on a subnet, the other computers on the network will be able to work out easily that traffic for that subnet has to go via a certain route. However, that's not always possible, and it might mean re-configuring lots of your systems just to add a single dial-in link.

An alternative solution is to use proxy-ARP. ARP is the Address Resolution Protocol, and it's the way in which computers running TCP/IP match ethernet addresses to IP numbers. With proxy ARP, you add an entry to the arp table (usually using the `/etc/arp` command) that effectively means your Unix server is saying to the rest of the network "If you've got anything that's destined for this address, send it to my ethernet card." When the information is received at the Unix server, it'll be passed to the PPP interface.

Since you don't say which version of Unix or PPP you're using, it's hard to be more specific, but it looks like using proxy ARP may be the best solution to your problem. Most modern versions of PPP will be able to make the arp entry automatically when they receive a connection; check your manual.

PCW Contact

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Waiting for the off

Tim Nott turns his attention to a common complaint: what to do if Win95 fails to tell you when your PC is safe to turn off. Plus lots of hints and tips, with purrfectly good advice from a cat!

I've been devoting a separate section of my column recently to quick answers to readers' problems; but Andy Bedford's cannot be answered shortly. Since it's a common problem, I'll treat it in detail. He writes: *"My computer advises 'Please wait while your computer shuts down'. I've been waiting three hours now and I want to go home! Only joking. But my PC never gets to the 'It is now safe...' screen."*

There are a number of reasons why this can happen, and it's such a tedious business trying to eliminate them that I'm going to take it in two chunks. We'll start this month with the most likely suspects. Often it's because a program is not shutting down properly.

1. The first thing to do is check that no programs are running when you shut down. If it only happens when a certain program is running, then there's your culprit. Even if no windows are open, there may be something running in the background or on the System Tray. Press Ctrl+Alt+Del and End Task for everything running except Explorer. You may get a "This program is not responding..." message, in which case you've probably caught the troublemaker.

2. If not, but Windows then shuts down cleanly, you can eliminate suspects by End Tasking each in turn, then closing Windows.

3. If the culprit is a program you don't recognise, or haven't run, then Windows is probably loading it at startup. Check the StartUp folder, and the Load and Run lines in WIN.INI. (Hint: the best way to edit this, and other files mentioned here, is to run SYSEDIT.) Next, run REGEDIT and check



Fig 1 All this for free; but you'll have to find it

the entries in the Registry under
 HKEY_LOCAL_MACHINE \SOFTWARE
 \Microsoft \Windows \CurrentVersion
 \Run

4. Next, check it's not sound-related. Go to Sounds in Control Panel and deselect the Exit Windows and Close Program events. If this cures it, then either one of the sound files is corrupt, or there is a hardware or sound driver problem.

5. Next, check the problem doesn't arise from a line in autoexec.bat or config.sys. Restart the computer, hit the F8 key when the Starting Windows 95 message appears, and choose "Step-by-step confirmation" from the menu. Answer Y to:

- Load DoubleSpace driver (if it appears).
- Process the system registry.
- DEVICE=C:\WINDOWS\HIMEM.SYS.
- DEVICE=C:\WINDOWS\IFSHLP.SYS.
- Load the Windows graphical user interface.

- Load all Windows drivers.

Answer N to everything else.

If that cures the problem, then it's being caused by a line in autoexec.bat or config.sys. So repeat the confirmation business, this time answering Y when asked to process config.sys and autoexec.bat, then by whatever tedious process of elimination you choose, isolate the culprit. When you've done this, edit config.sys or autoexec.bat accordingly, placing a REM at the beginning of the offending line — it will then be ignored on start-up. It's possible that this might be an old "real mode" driver, so if everything still works you have nothing to worry about.

If the problem still persists, it could be an old virtual device driver. Look in the [386Enh] section of SYSTEM.INI for lines starting "Device=" and ending "386". REM each one out in turn (hint: a semicolon here works just as well), to see if that fixes the problem. If you find the culprit here, then it's going to take independent detective work on your part to find its owner: right-click Properties, Version, is a good start.

For the love of bunny

Those with long memories might remember the first edition of the *Hands On Windows 95* column (July '95). In that, I mentioned full window dragging which was an option in early beta versions: as you moved a window around the screen, the contents remained visible instead of just the outline. Later beta versions removed the option, but it could be re-enabled by putting ILOVEBUNNY32=1 in WIN.INI. No, I am not kidding.

The final release removed the feature

Fig 2 How did it get there?



Tim'll fix it

Q Like many PC users, I am considering adding a second hard drive to my PC. Is there an easy way for me to keep my CD's drive letter as D: to avoid the problems with software installed from CD, including Microsoft Office and Windows 95 itself? If not, is there an easy way to persuade the software to accept the fact that my CD is now at F: rather than D: for installation of additional Windows components?

Steve O'Connor

A This problem is common, and the bad news is you can't keep the CD-ROM at D:. Formatting and partitioning the new hard disk will bump it down accordingly. Although this is too late to help, Steve, what you can do is plan ahead, keeping plenty of space for new hard disks (or removable media backup drives), by setting your CD-ROM drive further down the alphabet.

Go to Control Panel, System, Device Manager. Find your CD-ROM drive and click Properties. Select the Settings tab, and in the Reserved drive letters section, set both the start and end letter to the one you want the CD drive to use. OK back out of all dialogs, and restart the PC.

The best time to do this is just after having installed Windows but before installing other software. However, this will cause a minor problem with Windows Setup. Should you want to add or remove components you'll get a "Can't find..." error message, followed by a dialog in which you can specify the new path.

If you want to avoid this minor annoyance there is a simple registry tweak. Using Regedit, go to **HKEY_LOCAL_MACHINE \SOFTWARE \Microsoft \Windows \CurrentVersion \Setup** and look for an entry in the right-hand pane entitled SourcePath. Double-click on this to change it from D:\WIN95 to the new value.

Q I often need to edit HTML files using Notepad. I have a shortcut



Fig 3 PFE's Open defaults to All Files

on the desktop to Notepad and have changed its properties to open in the required folder. However, each time I select File/Open, I need to change "Files of Type" to "All Files" so that I can see the HTML files, and select the one I need. This is tedious. Can I change the default to "All Files"? Should I be going about this in a fundamentally different way?

Chris (no surname given)

A No *and* yes, in short. Notepad will remember "All files" for subsequent File/Opens in the same session but the only way to get this to be the default is to hack Notepad.exe with a Hex editor.

One solution is to use a better text editor. PFE (Programmers File Editor) is known and loved by many readers. It's wonderful for this sort of thing, opens multiple files and has many well thought-out features. And as Fig 3 shows, it solves Chris's problem. It's available in 3.1, 95 and NT versions, was written by Alan Phillips at the University of Lancaster and is completely free. Now there's a generous man.

The other solution is to use a different method. Instead of having a shortcut to Notepad on the Desktop, why not have a shortcut to the folder containing the HTML files? Then add a shortcut to Notepad in the Windows\SendTo folder, and you'll be able to right-click on any file and load it into Notepad with the Send To... command.

Q How can you tidy up the Add/Remove Programs folder which contains old program names

which have not been properly removed, or which have been deleted by other means?

Steve Lawson

The difficult way is to open the Registry in REGEDIT.EXE, then go to the branch **HKEY_LOCAL_MACHINE \SOFTWARE \Microsoft \Windows \CurrentVersion \Uninstall** and remove the offending entry from the list. The easy way is to use the Add/Remove feature of Tweak UI. If you haven't got this, it is available free as part of the Microsoft Powertoys, from a multitude of web sites.

Q Is it safe to remove the *.chk files (e.g. File0001.chk, File0002.chk and so on) which I have in my root directory? They are taking up over 15Mb of space.

Robin Kenny

A These are "lost clusters", which are basically chunks of data that have been orphaned without a file name. They have probably arisen as the result of a crash or power cut. If you have lost recognisable data, e.g. text, you might just find it lurking in one of these. Otherwise, delete them.

entirely but you could get it as part of the Plus! Pack. An extra page in Display, Properties offered desktop icon changing, font smoothing, full window dragging and other options (Fig 1). I don't know how well Plus! is selling these days, but when I came across something called the Microsoft Font Smoother, it rang a bell. The file is named W95GRAY.EXE and I found it on the Microsoft (UK) web site. It seems to be freely available elsewhere but we haven't been able to put it on our PCW CD as the licence agreement precludes this.

QBASIC.EXE, HELP.COM and HELP.HLP files from the Other\OldMS-DOS directory on the Win95 CD-ROM to your Windows\Command folder. You can then get concise help on DOS commands with decent examples given, by typing 'Help (command)' at the command prompt. It's DOS 6.22-specific but it's still helpful."

This next one's from Irfan Shabbir, in Karachi. Click on the Start button, then press Esc, which will close the menu but keep the button in focus. Hold down the Alt key and press the minus sign key. A little system menu will appear. Type M and you'll

be able to use the arrow keys to move the Start button along the Taskbar (Fig 2). Hit Enter when it's where you want it.

Even more amusing is that the situation is now rather unstable: you may find the button suddenly shoots back to its old position. It may also disappear, in which case, Control + Esc will find the Start menu. As a variation, try C-for-close on the little system menu. The Start button will disappear and Control + Esc won't work either, but everything else will be normal.

I suppose I really ought to tell you how to get the button back. This can be quite a seriously useful technique if Explorer, the Windows "shell", goes belly up. What you need to do is load a new instance of the shell, as follows (see also Fig 4):

1. Ctrl+Alt+Del to get the Close Program dialog.
2. Select Explorer, then click End Task.
3. Click No in Shut Down Windows dialog.
4. Wait... a box titled Explorer will appear stating that "This program is not

responding...". Hit the End Task button.

5. Wait... a new instance of the Taskbar and Start button (i.e. the Explorer Windows shell) will load.

Catisfaction guaranteed

Reader Peter McGarvey has been suspiciously quiet for a while but, true to form, he's come up with a magnificently arcane tip this month, which he claims was discovered by his cat. Do you want the truly bizarre details? Of course you do.

Peter does things in DOS (well, someone has to). Without getting too sidetracked, there's a MODE command that you can use to change, among other things, the number of lines on the screen. There's also loads of stuff you can do with ANSI.SYS, such as assign strings of characters to a keystroke. Anyway, to cut a long story short, Peter had assigned a key using an ANSI escape sequence to return MODE CO80, which is DOS-speak for change the DOS display 80 characters per line.

Over to Peter: "One day I shut down Windows and up popped my version of the power off message. At this point one of my cats, Oz Beast, jumped up to say hello, landing on my keyboard. After the obligatory assurances that she was, without a doubt, the cutest feline in the whole universe, I went to turn off my PC and noticed something very strange. The most excellently designed and mildly amusing screen, which I created specially to indicate that my computer was ready to be turned off, was missing. In its place was a command prompt. I thought about this and realised that Oz must have done something to cause this. After much trial and error, I discovered that it was the MODE CO80 hotkey which caused this. Furthermore, I discovered that actually typing MODE CO80 did it as well."

Well, there you have it. I find it only works if you use an explicit WIN command to start Windows, either from a DOS prompt or in autoexec.bat. But since this is the first time a cat has contributed to this column, a tin of tuna fish is on its way to Oz Beast.

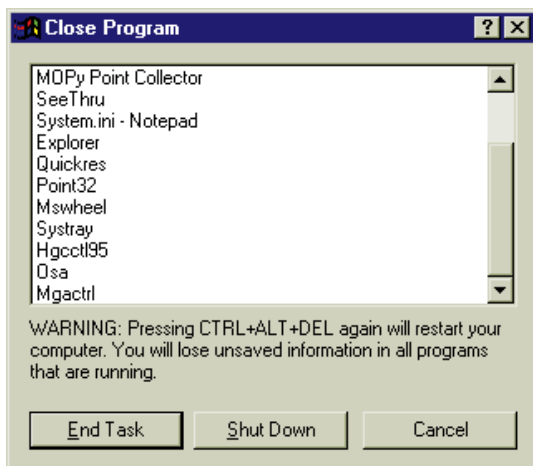


Fig 4 Good grief: who started this lot?

The file is self-installing, and you're asked if you want to add font smoothing. However, it adds not just this, but the entire Plus! page to display properties. At least, the later version, weighing in at 174,120 bytes, does.

Department of incredibly obscure tips

■ Simon Smith has a Help hint. "I find the help for DOS commands (e.g. DIR /?) a bit poor. I recommend copying the

PCW Contacts

Email **Tim Nott** at win95@pcw.co.uk or write to him c/o the usual PCW postal address (p12).

The Programmer's File Editor lives at www.lancs.ac.uk/people/cpaap/pfe/



The OLE routine

Panicos Georghiades and Gabriel Jacobs show you what to do if your Windows installation gets corrupted and your programs don't work. Chances are, it's OLE registration trouble.

It's not too uncommon for a Windows installation to become corrupted to the point where certain programs do not work at all. One of the first things to investigate is the possibility of a corrupted registration database. If you suspect this (see "Rebuilding the REG.DAT" for reasons why) you may choose to make a fresh installation of Windows and all your programs, as we have suggested in Paul Cunliffe's case (p263), or you could first try to rebuild the registration database.

Program Manager and Object Linking and Embedding (OLE) registration information is stored in .REG files that are used by the Registration Editor (REGEDIT.EXE) to add information to the registration database, REG.DAT.

REG.DAT contains information about file associations and OLE objects. The Windows 3.1 Setup program uses REGEDIT.EXE to add default associations for Paintbrush, Notepad and some other of its programs and objects (like Packager, Paintbrush, and Sound Recorder).

REG.DAT is not copied from the original disks. Instead, it is built using REGEDIT.EXE and the SETUP.REG file (in the Windows\System sub-directory) during setup.

A sign that the REG.DAT file may be corrupted is one of the following messages:

- File Manager cannot open or print the specified file. Start the application used to create this file and open or print it from there.

- There is no application associated with this file. Choose Associate from the File menu to create an association [only if you know for a fact that there is an association].
- There is a problem with REG.DAT. Delete REG.DAT and restart Windows.
- Setup had a problem with REG.DAT, SHELL.DLL or disk space.
- Windows registration database program is not valid.
- OLE server initialisation failed.
- Windows registration database is not valid.

Rebuilding the REG.DAT

If your REG.DAT file has been deleted or corrupted, you can rebuild using the methods shown below.

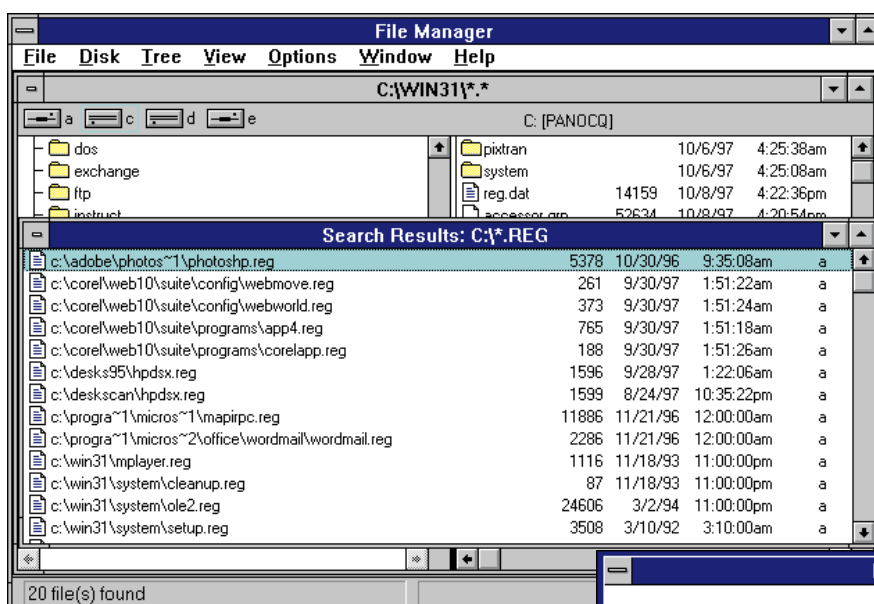
Building the original REG.DAT file for applications that came with Windows:

To restore these defaults, first rename your existing REG.DAT file (if there is one present) before you try to rebuild it. We assume that your Windows directory is on drive C and is called WINDOWS.

1. Run Program Manager or File Manager.
2. From the File menu, choose Run.
3. In the dialog box, type the following:

```
regedit /u c:\windows\system\setup.reg
```

A message should appear, confirming that the information has been registered. The database now contains the original registration information that was installed with Windows.
4. Choose OK. At this point, you may have to exit and restart Windows in order to see



Above To find all the REG files, use the search feature in File Manager

Right Once you register a REG file, you should get a message saying that the registration was successful

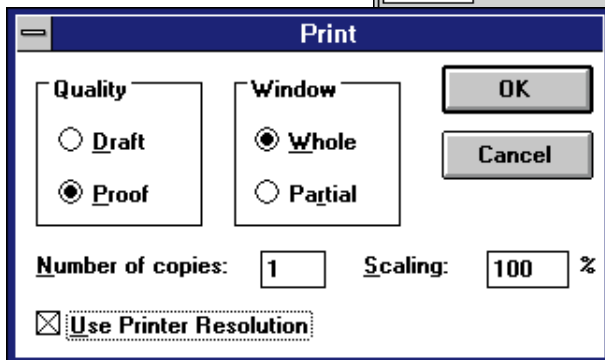
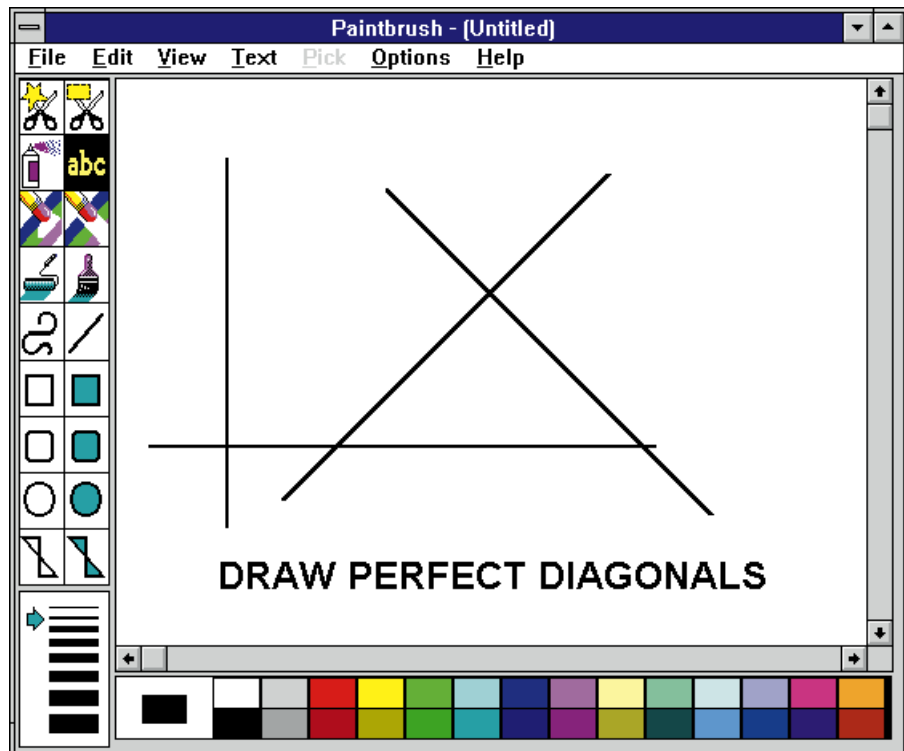


Paintbrush tips

Let's face it, there are more powerful Paint programs than Paintbrush, but it's there, free, and many people use it. Here are two useful tips.

1. To draw lines in Paintbrush that snap to 45-degree increments, select the line tool (not the brush), then hold down the Shift key and draw. You'll only be able to draw vertical, horizontal and diagonal lines, but it's a useful thing to know (it saves you struggling to keep the mouse still!). The technique also works with other drawing tools. To restrict yourself to vertical and horizontal lines, select the brush tool instead of the line tool.

2. If printouts from full-screen Paintbrush images turn out to be miniature versions of the actual image (just a couple of inches or so), you have the Printer Resolution checkbox selected in the File Print dialog box. This makes Paintbrush translate pixels on the screen to dpi (dots per inch) on your printer. In other words, if your image is 640 x 480 and you're using an HP DeskJet that prints at 360dpi, your image will be printed at $640/360 \times 480/360 = 1.77 \times 1.33$ in. Although this



Above To draw perfect diagonal lines in Paintbrush, use the Shift-Key with the line tool

Left Uncheck the Use Printer Resolution box if you are getting minute printouts

setting will give you printouts with the highest resolution (no jagged edges), you will need to work with very large image sizes to print reasonable size images (1,800 x 1,800 pixels for a 5in x 5in print on a printer with a 360dpi resolution). Images at this size or above may be unmanageable if you don't have lots of RAM; in these cases, you need to work with the Printer Resolution checkbox turned off.

the REG.DAT file displayed in File Manager. When it is, execute the next step.

5. In File Manager, select the REG.DAT file found in the Windows program directory, then choose Associate from the File menu. Associate files with extensions DAT and REG with REGEDIT.EXE. When you removed the old REG.DAT file, you also removed your file associations list, therefore you have to choose REGEDIT.EXE using the Browse button.

6. Exit and restart Windows. After you have created a new REG.DAT file or restored the defaults, use the following steps to renew the list of applications in the Associate dialog box:

(a) In File Manager, choose Run from the File menu.

(b) In the dialog box, type the following line:
`regedit /u c:\windows\system\setup.reg`

■ Rebuilding the REG.DAT file for other applications:

For applications other than the Windows-based programs included with Windows 3.1, the technique varies for rebuilding REG.DAT. Some applications rebuild their entries each time the application is started. Others may register themselves only during their setup processes.

If the application includes a REG file, you can add that information to the registration database in one of three ways.

1. Choose Merge Registration File from the File menu in the Registration Information Editor, then select the .REG file for the application to be added to the database and choose OK.

2. Use the same steps described above, substituting the name of the .REG file.

Otherwise, consult the application's

documentation, or contact the vendor of the software for more information about rebuilding the REG.DAT file.

3. Run Windows File Manager and double-click the application's .REG file.

If you need to rebuild the registration database for all your applications, use the following steps:

1. From the File menu in File Manager, choose Search.

2. Search for *.REG from C:\. Ensure that the Search All Sub-directories checkbox is selected before you choose OK.

3. Run SETUP.REG by double-clicking the file icon, or highlight it and press ENTER.

4. Run every other .REG file brought up by the File Manager search.

So, a Happy New Year to all our readers, and no (or at least, very few) General Protection Faults!

Questions & Answers

Q My Windows 3.11 system seems to be falling apart! It started a week or two ago when I found it impossible to launch applications by clicking on an associated file in File Manager. Since then, I have encountered the following:

1. CorelDraw 3: Each time I create/edit an object I get the message "Error while performing an OLE request", although when I acknowledge this message, it allows me to continue.
2. PhotoFinish: I cannot launch this. I get the error message "OLE Instance Init failed — please re-install program".
3. Picture Publisher: Will not launch and there is no error message.
4. WordStar version 2/Quattro Pro version 6: When I update spreadsheet data which has a link to a WordStar document, I get the error message "Internal WSWin Error" followed by "Fatal Error 600e".

I am beginning to see a pattern emerge — OLE problems — but have no idea how to correct them. Would it be best to re-install Windows? And if so, will it re-install over what is already there, or do I have to uninstall it first?

Paul Cunliffe

Paul@sischem.telme.com

A In terms of clearing whatever is "bad" in your installation, yes, your best bet is to make a fresh start and re-install Windows and all your applications, having first deleted what is there. This takes time, but if you are only using the applications mentioned above, it should not take you more than a couple of hours.

There may be other ways to fix the problem but you could spend a lot longer trying — and possibly failing. But remember, before you begin, make sure that you have backed up your data.

However, there is one seemingly major problem which can be fixed with a repair job as opposed to a full re-installation of Windows: in the main body of our column we have covered what you can do when you encounter corrupted registration files.

Q I have a 386/33SX with 8Mb RAM and a 1Mb SVGA Trident card running in full-resolution 256-colour without problems under DOS 6.2.

I have recently attempted to run

SVGA via the Windows Setup, only to find corrupted displays above 16-colour VGA.

I had Trident drivers T800C and T1024C installed and have recently downloaded the latest drivers from Trident for my T8900CL board, but the problem remains.

I have decompressed my drive, re-installed Windows and it is still the same. Is this a memory conflict or a missing SYSTEM.INI instruction?

Carolinelt@aol.com

A A problem of this kind is documented for the Windows 3.11 SVGA driver and Trident 1 MG cards, but it refers to when switching from an MSDOS full-screen mode to window mode using the Alt-Return keys. The solution is to update to newer drivers — the specific Trident driver that corrects this has a date of February 1994.

You can also try the general SVGA drivers supplied by Microsoft in the Windows Driver List (WDL) available from the Microsoft web site. The relevant file is SVGA.EXE. This supports most non-accelerated SVGA display types at 640 x 480 in 256 colours, and 800 x 600 and 1024 x 768 in 256 colours using either Small or Large fonts (five settings in total).

Your card — the Trident 8900C series — is included in the supported list. However, it is more than likely that your problem may stem from a memory conflict. Some graphics cards use additional memory to enhance performance. Windows detects most of these cards and automatically excludes the additional memory. But if it does not, you can add the line below to the [386enh] section of SYSTEM.INI:

```
emmexclude=C400-C7FF
```

This prevents Windows from scanning the addresses C800:0000 through CFFF:000F — the block that some VGA cards use to enhance performance. If you don't want to exclude the *whole* memory block, your card's manual should show what does need to be excluded.

PCW Contacts

If you have any queries or Win3.1-related topics to discuss, contact **Panicos Georgiades** and **Gabriel Jacobs** at Win3@pcw.co.uk



Trouble comes in **threes**

The three setup disks Andrew Ward has created are causing him trouble with NT installation, but help is at hand for this as well as problems you may have with the WinNT/95 registry.

It seems that whenever I try to install Windows NT, I get problems. One of the most persistent troubles I encounter is the error message: "Setup is unable to locate the hard drive partition prepared by the MS-DOS portion of Setup". Like most of my problems, this one is of my own making. Specifically, it's the three setup disks that I've created from the CD-ROM by using the `winnt32 /o` command.

The reason I have to make the disks is because I am often given the CD-ROM for Windows NT only, rather than the complete kit including floppies. Fortunately, once you know what is the reason for the error message it's straightforward to fix.

When you run `winnt32 /o` to create the three setup disks, a file called `WINNT.SIF` is made that tells setup the location of the temporary files on your hard disk. Of course, if you then use these floppies on another system (which is what I do), those temporary files won't be there.

The answer is to delete the file `WINNT.SIF` from disk 2 of the three-disk set. Alternatively, if you create the floppies using `winn32 /ox`, you shouldn't have the problem in the first place.

Setup is the cause of problems to many people, not just myself. Microsoft has recognised this and has provided a troubleshooting guide for setup problems on its web site at www.eu.microsoft.com/support/tshoot/ntsetup.HTM.

This troubleshooting guide is fairly tedious to work through — it's a step-by-step questionnaire. Consequently it takes up a lot of online time, but it is nevertheless very thorough and it has worked for me. For any setup problems that you encounter, I would advise you to take a look.

And while on the subject of setup, I have here a newly-assembled server happily running Windows NT 4.0. The other day I received the beta of Windows NT 5 and naturally wanted to have a go at installing it. Setup hardly gets anywhere before it reports that it cannot find the CD-ROM drive. Well, excuse me, but it's right there inside the machine and if NT 4 can find it, I don't see why NT 5 can't.

If I ever do get this sorted out, I'll let you know. For the time being, I've just copied the files to the hard drive and am trying to install from there: setup still fails halfway through, though.

Playing the game

Now for a bit of light relief. More and more people are moving to Windows NT 4, and one of the topics that readers bring up with increasing frequency is games. The most recent message was from Darren Long who has sensibly written off his trashed Windows 95 installation and moved to NT 4 instead, but now wants to know what games will run.

I am pleased to report that the answer is, plenty. An increasing number of modern games will run happily under NT 4 — those that will not are becoming the exception. For myself, I have used Quake for some time under NT and it runs absolutely fine.

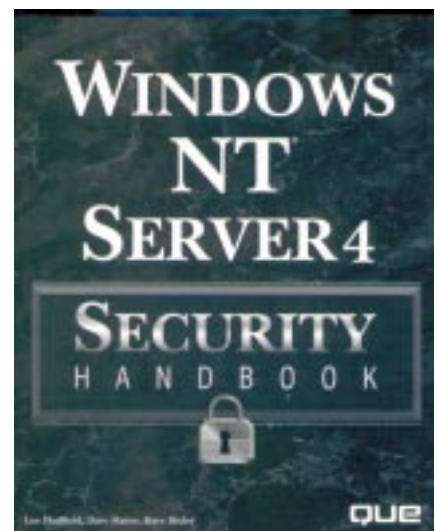
Other new games that will run without special treatment are Doom II for Windows 95, Ultimate Doom for Windows 95, and Obsidian. Many other games will run too, although some might need the odd tweak.

Really, the best thing I can do is to refer you to the web page, Dave's "Games under NT4", where you will find a list of which games do and do not run and links to many of the games themselves, as well as details

of any special instructions you need to follow to get them to work. Dave deserves a great deal of praise for his unstinting work on behalf of Windows NT games enthusiasts. www.cris.com/~Dstaines/nt40games/.

Security

Although it contains much useful information, I'm not sure that I'm entirely happy with the *Windows NT Server 4 Security Handbook*. There is plenty of detail on the security features of Windows NT 4



Security is a must. What does Windows NT 4 offer, and does this book cover the issues?

and how to use them, but not much about the more important issue of the security policies and procedures for which the technical knowledge is necessary.

Today, corporate data needs to be treated as importantly as any other asset — for some organisations, it is *the* most important asset — and you need someone

at board level to take responsibility for it. The next step is to carry out a risk assessment and then devise a security policy commensurate with that risk. There will always be security breaches, but you design your security policy to minimise the impact. It is not appropriate for the total responsibility of designing a security policy to rest with the intended audience of this book.

Having had my moan, I'll return to the book. It is comprehensive and points out a number of undocumented or frequently overlooked security holes. For someone who is implementing a security policy, or providing technical advice on what is and isn't possible, this is a useful aid.

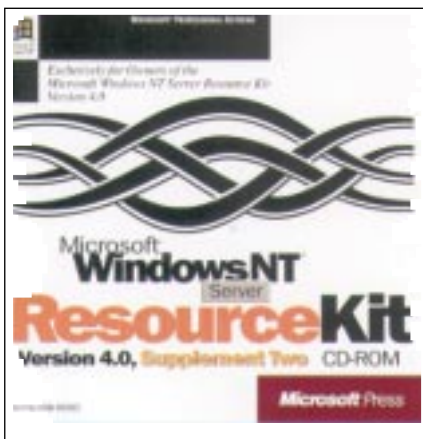
Particularly useful are the sections which explain how things actually work, such as the challenge/response network authentication sequence. There are also clear flowcharts showing the way authentication is carried out for remote resources, and how share permissions combine with NTFS permissions to control access to directories. In fact, the diagrams are one of the nice features of this book.

Returning briefly to the (still-unsolved) problem of automatically creating individual directories with the appropriate permissions, this book does address the issue but glibly states that: "User Manager for Domains automatically... assigns the appropriate permissions". I wish.

Finally, it's worth pointing out that Service Pack 3 and subsequent patches tightened up many security areas of Windows NT 4, so some of the information in this book will now be out of date.

Resource Kit Supplement 2

The Windows NT Server Resource Kit Version 4.0 Supplement 2, to give it its full title, is a two CD-ROM kit — there are no books included. Although you can use this



supplement on its own, it is intended as an upgrade for those who already have the original Resource Kit and you will get more value from it by first buying the full kit. The Resource Kit is pretty much essential reading, as it is to all intents and purposes the full manual for Windows NT.

One CD-ROM contains an updated version of the Resource Kit standard suite of software. It includes 14 new tools, one of these being reg.exe, a command-line registry manipulation utility that actually replaces eight previous utilities. The Service Monitor monitors services on both local and remote machines, and can even send Exchange an email or paging signal when a service starts or stops.

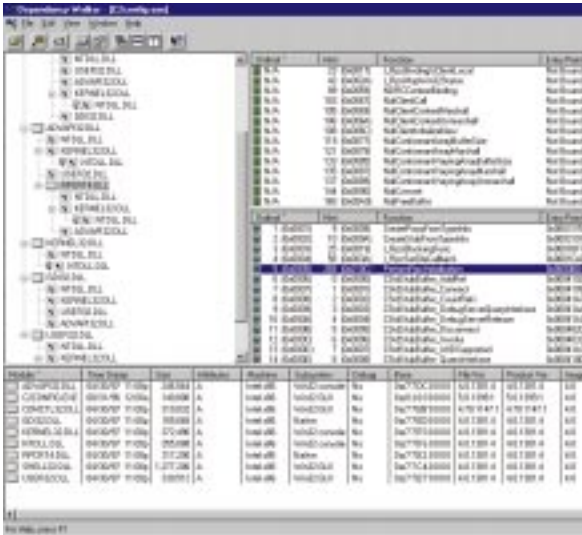
The other CD-ROM contains a February 1997 copy of TechNet which includes quite a lot of useful material including, oddly enough, the full text of the Windows NT 4.0 Resource Kit (both Server and Workstation). Additionally, there is the Windows 95 Resource Kit text and lots of technical information on BackOffice, MS Office and desktop applications.

Dependency viewer

One of the more interesting new utilities is the dependency viewer. Any NT user will find this helpful and it will also be useful to developers and those working in support departments. Using recursive scanning, the viewer shows a complete module-dependency tree diagram of the modules needed by an application.

It also shows two other types of information. For each module, it displays a list of all functions exported by that module (whether by name, ordinal or forwarding). Conversely, it shows all functions within a module that are actually called by other modules. Hence, it can be used to identify the minimum set of files you need for an application to run, to help understand why a particular module is loaded with a particular DLL and to resolve "dynamic link library could not be found" errors.

The scanning procedure will detect files that are missing, corrupt, or non Win32 compliant. It will also check that all functions imported to one module are actually exported from the dependent modules, thereby highlighting those problems that give rise to "the procedure entry point could not be located in the dynamic link library" errors. The time saved on chasing one DLL problem alone would justify the £46.99 price of this upgrade.

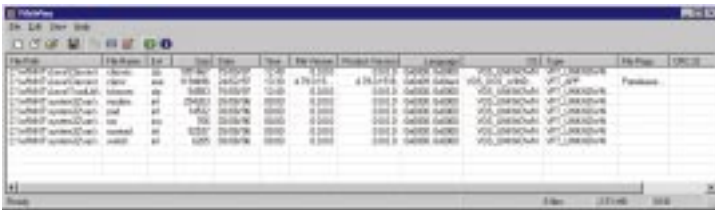


Left If you have ever had a DLL problem, this dependency viewer in the resource update is a must

themselves, and there is a valuable section on how to protect the NT registry and recover from a registry failure. A clear chart shows the differences between the capabilities of REGEDT32.EXE and REGEDIT.EXE. Additionally, there is a comprehensive section on using the system policy editor. The book

Filewise

Filewise shows file version information, for an individual file or for all files within a folder. You can get at this information in other ways, but it's particularly convenient to be able to display it in tabular form for several files. You get pretty much the information you'd expect, like time and date, version, product version, language, operating system and hints on ISO 9660 compliance.



The Filewise viewer shows version information for files

And don't forget that one of the most useful features of any Resource Kit Supplement is the updated regentry.hlp file which gives up-to-date information on NT registry keys.

Windows NT/95 Registry troubleshooting

As we're on the subject of the registry, the new SAMS book *Troubleshooting and Configuring the Windows NT/95 Registry* is worth a brief mention. A great many problems can be solved by fiddling around in the registry, but unless you know what to look for it's difficult to know where to start.

The file regentry.hlp, referred to above, is great but it's fairly unstructured information. On the other hand, this book gives practical advice such as how to tweak the registry to get a Windows NT 3.51 modem driver working with Windows NT 4.

Registry security and auditing gets plenty of treatment, as well as the registry keys

includes a CD which contains a variety of utilities, including a registry search tool.

Zip it up

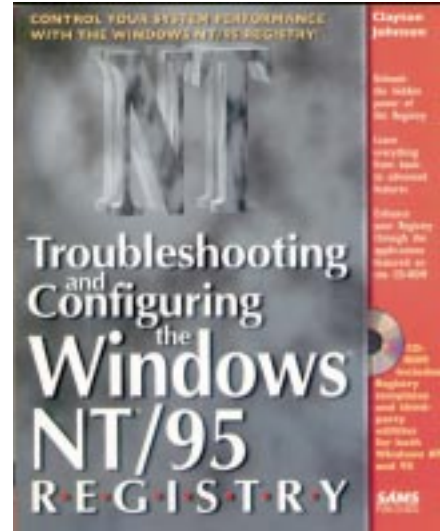
Here is a flashback to Zip drives, and some helpful comments from reader, Peter Edgley, who has found a much better way of adding a Zip drive to an NT system without having to go through all that palaver of fiddling around with drive letters and the rebooting that's involved.

In his particular case, the system has two hard drives, an EIDE

drive (C:) and a SCSI drive (which is assigned letters D:, E: and F:). The SCSI drive is connected to that old favourite, the Adaptec AH1742A. (I'm still using one of those, for various peripherals like CD-ROM drive, tape drive and scanner.)

One of the features of this and many other SCSI controllers is that there's an external connector provided (in my case, this is where I plug in the scanner). Peter says that by far the easiest way to implement a Zip drive under NT is to obtain the SCSI version and plug it into this port. Just as any other SCSI device would be, the Zip drive is assigned the next available drive letter (G:, in Peter's case). What's more, the drive then works straight from Windows NT — Peter hasn't even touched the utility disk that came with it.

OK, this solution does mean you have to pay a bit more for the SCSI version of the Zip, but it's just so much easier and I can see why Peter is keen on it. He has



discovered just two minor drawbacks. The first is a costly adapter to connect the Zip drive to the connector on the Adaptec controller, and the second is that the CD-ROM drive letter (but fortunately not the hard drive letters) can move depending on the SCSI addresses you use.

Peter recommends always fixing the CD-ROM drive letter at R: (wouldn't this make life so much easier if everyone did it?) so it will never have to move again. I would go further and suggest a scheme for fixing tape, hard drive and CD-ROM drives at specific SCSI addresses, such as 6, 0-3 and 4 respectively. That leaves 5 clear for the Zip drive if you have one and should not upset the CD-ROM.

Accent Composer

Accent Composer, the accented characters utility I mentioned last month, is on our cover-mounted CD this month. The evaluation version is valid for 30 days, after which you need to register. Contact: Dr Warren Kovach, Kovach Computing Services, 85 Nant-y-Felin, Pentraeth, Isle of Anglesey LL75 8UY.

PCW Contacts

Andrew Ward can be contacted at NT@pcw.co.uk or write to him at the usual PCW address (see page 12).

- All books are available from **Computer Manuals** 0121 706 6000 www.compman.co.uk/
- **Microsoft Windows NT4 Server Resource Kit Supplement (two CDs)** Microsoft Press, £46.99; reference 285570
- **Troubleshooting & Configuring the Windows NT/95 Registry Book/CD Package** SAMS, £46.95; reference 274951
- **Windows NT Server 4 Security Handbook** Que, £36.99.



Running hot and cold

After a disappointing initial experience with ISDN, Chris Bidmead has now found an affordable router to speed up connections. Plus, the wise giants of Linux have their say.

Round about this time last year I was boasting to you about having had an ISDN line installed, and the increase in speed it brought to my internet access... Well, mostly just about having the line installed, because if the truth be told, the speed increase over ordinary phone dialup wasn't that great.

There was *some* reduction in the time it took to connect, but I wasn't seeing anything like the theoretical two seconds connection time. My ISDN terminal adapter (TA) was connected via a serial line into one

of my workstations, on which I'd have to run a dialup app which would trigger my ppp daemon, which would then tickle the TA into action, and I'd get a connection in about 20 seconds.

During connection, all the packets would have to go through the somewhat sluggish ppp daemon on my NeXT machine, and along the serial wire, which can be a bottleneck at these kind of speeds. Yes, it was still faster than a 33Kbps modem, but frankly not much and nowhere near the theoretical rate of 64Kbps for my ISDN line.

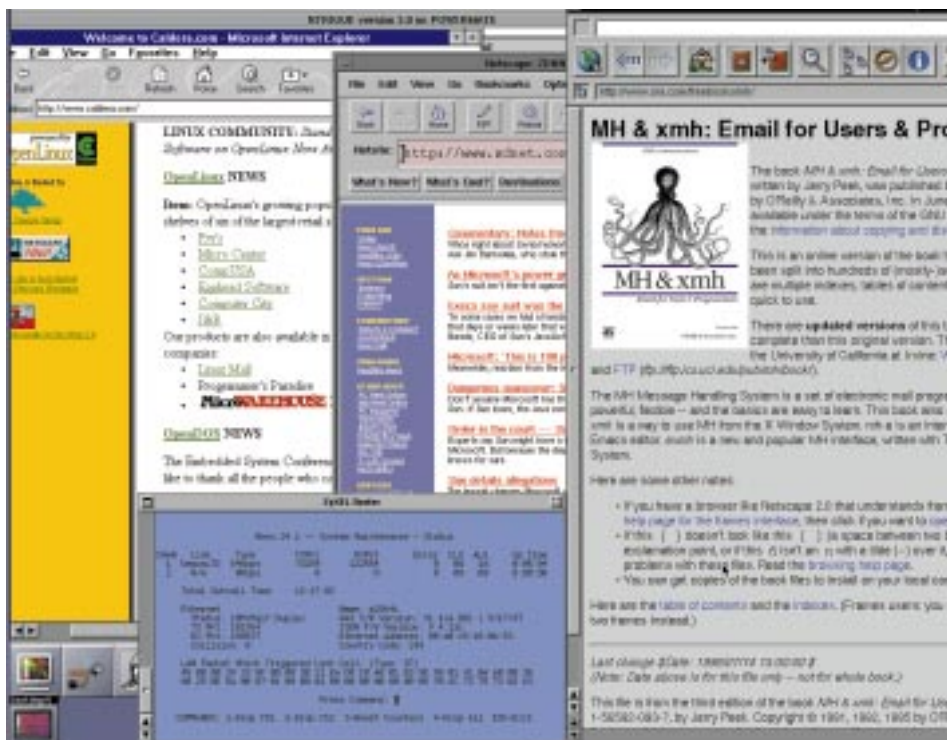
The reason I'm putting all this in the past tense is that I've just installed a new gizmo which changes everything. It makes me feel like someone who's been boasting about having a mains water supply installed and has been taking friends down to the end of the garden to see the tap sticking out of the ground. It's called an ISDN router. It's a class of product that has been around for several years, but what's new is the price, which brings it within reach of the ordinary user. This one comes from the Taiwanese company ZyXEL, and is distributed in the UK by P&L Systems.

I'll tell you more about the router next month. In the meantime I'll just round off the rather crude "mains water" analogy by saying that I now have hot and cold running water throughout the house. (See the screenshot, left, for further clues.)

Up and running

I can't say I always enjoy helping readers through their installation problems (read all the relevant HOWTOs at www.caldera.com/LDP/HOWTO/HOWTO.index), but there's a lot of satisfaction when, after a series of letters, I receive correspondence saying: "I'm up and running." To add to the fun, this can be a multi-stage process: "Great, I'm up and running... but now I need to install X." And then: "Thanks, Chris, I have a complete Unix system... Now help me set up my ppp connection to my provider."

Microsoft and Mac users who read this column to find out what's happening on the other side of the fence are welcome, and I'm keen



I couldn't resist showing off. Here are three different browsers running on three different machines (Netscape and Microsoft Explorer are X Windows, on the Apricot LS550 and the NEC PowerMate respectively, and my NeXT machine which is running its own OmniWeb browser). The browsers are all live, each with their own set of TCP/IP connections to the ZyXEL router which in turn connects them to the 64Kbps ISDN line to my service provider

Chris's question time: Finding your way

Q Chris, I'm lost. I have a working Linux system, but I've no idea what programs are available on it, or where to find important files.

A That's OK. We all start out feeling like that when coming to Unix from, say, the DOS world. It reminds me of the tribe of pygmies who had a habit of getting lost in the long grass. Here in the Unix world, the long grass is certainly very tall, but we don't just jump up and down in it; we sit on the shoulders of giants. And where do you find these giants? Where else, but right inside your Unix system. If you've been following my column, you'll have heard of the daemons in there; those

tireless slaves who take care of the grunt-work. But the wise giants are all in there, too, ready to give you a lift any time you want to wake them up.

If you find this personification of Unix rather twee, try to get used to it. As with the ancients, personification turns out to be a useful way of making sense of a complex world. Let's start with the command "man man": it evokes the manual page about the manual system. Read that, and you'll know how to find out about the whole Unix system and all the installed utilities — and the programming stuff, too. It will tell you how to use "man -k" or "apropos" (which means the same thing) to find

manual entries on everything relevant to a particular subject: booting, managing the keyboard, or whatever.

If finding files is your problem, "man find" will tell you all about the find command. This will find files, although it's most important use is for delivering a qualified list of files names for you to do something else with, like feed into another command. But "man find" will also point you in the direction of the locate command, which uses a database for fast look-up of file locations. "Man locate" will tell you more about this, particularly how you maintain the file database, and will direct you to the Info chapter on Finding Files.

Bidmead's books: UNIX Power Tools (2nd edition)

Authors: Tim O'Reilly, Mike Loukides & Jerry Peek
Price: \$59.95
ISBN: 1-5659-2260-3
Publisher: O'Reilly

This second edition of the classic tome, first published in 1993, is a substantial revision of the original work, incorporating hundreds of readers' suggestions and corrections, and is now slanted more heavily towards the ubiquitous GNU flavours of Unix, including Linux. This toolkit of tips and tricks is a shapeless collection of short articles by a variety of authors. You'll search in vain for a narrative line or a personal philosophy.

It's big, too. Including the bundled CD-ROM of freeware source and binaries for the most common Unices, it weighs three and a half pounds and runs to over 1,000 pages! It's an unglamorous book which deals in the lowdown on the sometimes unlovely entrails of Unix, with tips on taming vi, backing up files with tar, and the messy nitty-gritty of file ownership flags. It tells you how and when to kill processes (and when not to). It contains valuable hints on improving your shell programming (avoiding the C Shell like the plague). It's also a sampler for other O'Reilly books, with extensive borrowings from O'Reilly's *Nutshell* range of handbooks.

If you don't care much about the real Unix that lurks under the veneer of X, this book is probably not for you. Neither will this be the right book if you're looking for a general overview of Unix. However, if you work regularly with the operating system and are ready for a fundamental seminar on, say, how files are connected to filenames, then this dumpty tome is the bible to turn to. As co-author Mike Loukides jokes: "The ability to mumble about inodes is the key to social success at a Unix gurus' cocktail party." This book is just such a cocktail party.



message is probably the easiest way to discover the device name of your CD-ROM drive, which varies from system to system and from drive to drive.

If you're using Linux, Shift-PageUp will scroll the boot screen back to find it, as long as you do this as soon as the boot has completed. (The Caldera OpenLinux implementation offers a pause point in the install that suggests you do this.) But if you're like me, you won't notice that the CD-ROM drive is missing until you try to access it, and by then you've probably lost those initial screens out of the console buffer.

So how do you read these messages again? Simple — that's what the "dmesg" command is for. Read the dmesg manual pages. It was clear from the dmesg output that Jonathan's system wasn't finding the CD-ROM device, so I directed him to Jeff Tranter's CD-ROM HOWTO and suggested he take a look at the Modules HOWTO as well. Armed with those two documents he was able to install the CD-ROM with no further help from me.

Yes, it's all working fine, he wrote in his next email... except the most important thing: how do I connect to the internet?

I sent Jonathan back to the good old HOW-TOs, particularly the PPP-Client-HOWTO and Winfried Trumper's excellent PPP-over-minicom mini-HOWTO.

that as many readers as would like to should bring up their own live Unix systems. So if you're struggling with an intractable install, drop me an email and we'll fix it. For instance, there are some elementary installation queries which repeatedly crop up. The geometry of large hard drives is one of them (take a look at the BootPrompt HOWTO and the Large Disk mini-HOWTO).

Another old favourite is exemplified by reader Jonathan Murphy's query: "When accessing my drives, I can't get my CD-ROM to mount. Under Slackware it was

'mount /dev/hdd (dir to mount to)' but when I try this under Linux Pro it reads 'mount: /dev/hdd is not a block device /dev/hdd:No such device'.

I told Jonathan about "dmesg", a great installation diagnostic tool. It took me ages to discover it, but when you know about it life is a lot simpler. "Remember those initialisation messages that scroll up your screen too fast to read when you're booting up?" I wrote back. "Among them will be a line announcing that a probe has found (or perhaps not) your CD-ROM drive." That

PCW Contacts

Email Chris Bidmead at unix@pcw.co.uk

ZyXEL ISDN router from P&L Systems
info@plsyst.co.uk



Losing your bottle

Fed up with your server? Is it a bottleneck which slows up your system? Terence Green uncorks some options to alleviate matters. Plus, is it better to buy or build your own PC?

Having viewed Warp rumours at www.jmast.se/warpx/warpx.htm, reader Richard Avery wonders whether there is any other news of Warp 5. See the OS/2 columns in the March and April 97 issues of *PCW* for more details, but in summary, everything to do with Warp 5 seems to be going according to plan. The promised Java 1.1 update has arrived, new TCP/IP software for Warp Server is available, Netscape 4 is close to beta, and we're still waiting for SmartSuite for OS/2!

Having previously hedged my bets in consecutive columns with an each-way prediction on SMP support for the Warp client, I'd hazard a guess that Warp 5, client and server, will have a single SMP-enabled kernel. As for the rest, it will be improvements all round, much of it coming out as fixes, or Fix Packs. Recent Fix-Pack enhancements include improved drive support, a 32-bit CHKDSK, performance tuning, and a fix for a Warp 4 problem with DOS boxes hogging the system.

Rumours, news and any available information regarding Warp 5 can be found on the net

The SmartSuite for OS/2 Warp beta program is now under way. Perhaps we may see shipping product in 1998? Netscape Communicator for OS/2 will probably be in beta or shipping by the time this issue has been printed. You can check progress at <http://people.netscape.com/danda/index.html> which is home to one of the developers. Another source of information and comment on OS/2 Warp issues can be found in "Timur Tabi's Guide for New and Potential OS/2 Users" at www.os2ss.com/Information/NewUsers/.



In October, IBM announced TCP/IP 4.1 for Warp Server featuring enhanced Dynamic DNS support for faster, more secure intranets and OS/2 Warp, Windows 3.11, Windows 95, Mac and Windows NT clients. TCP/IP 4.1 for Warp Server includes a Java user interface. Administrators can log on to the network from any system. The Warp web page at www.software.ibm.com/os/warp will keep you up to date on these and other advances.

TCP/IP updates appear on IBM's software FTP site at [ftp://service.software.ibm.com/ps/products/tcpip/](http://service.software.ibm.com/ps/products/tcpip/) in the [/beta](#) sub-directory.

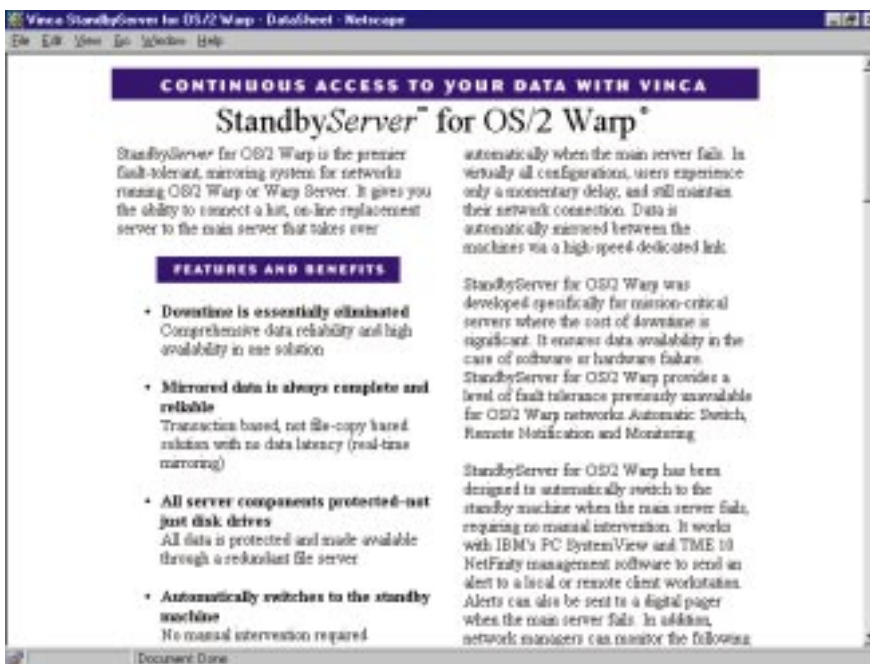
Message on a bottle

What to do when the server becomes the bottleneck? Intranets and web servers suck up CPU cycles and the Pentium Pro only supports four-way symmetric multi-processing. Current Pentium II systems are limited to dual processors.

Compaq solved the problem by buying Tandem's mid-range business, and then in

Tel's tips

- **Fix Packs for Warp 3 (31) and Warp 4 (3)** are at [ftp://ftp.software.ibm.com/ps/products/os2/fixes/warpv4/](http://ftp.software.ibm.com/ps/products/os2/fixes/warpv4/) while the Team OS/2 site at www.cincyteamos2.org/warpservice.html remains the best source of update and Fix Pack status.
- **If you're getting into Java programming** and using OS/2 you might want to have a look at InstallShield Java Edition from www.installshield.com. InstallShield Java Edition is a visual tool for developing single installation programs that run on all Java-enabled platforms.
- **Looking for a secure web server?** Get Lotus Domino Go Version 4.6 for OS/2 Warp from www.ics.raleigh.ibm.com/dominogowebserver/getos2.htm and tuning advice from www.software.ibm.com/os/warp/performance/os2gotip.html.
- **IBM has a new OS/2 Warp driver** for CD-ROMs which supports the Microsoft Joliet file system, mixed case and long filenames at http://service.software.ibm.com/os2ddpak/html/miscellb/os_2warp/updatedc/.



Standby your LAN. Vinca's high-availability system for Warp Server (see below)

September Intel bought Corollary and its eight-processor SMP design skills. If you're committed to server applications which only run on Windows NT, you're in a waiting game. But there are alternative options.

The new Warp Server for AS/400 can move an existing Warp Server file and print service on to an AS/400 application server. Huge overkill if you only need a faster PC, in which case the less expensive alternative would be the SMP upgrade for Warp Server Advanced and a four-way or eight-way SMP box. IBM, Intel and several others have used Corollary's eight-way systems.

Multiplatform software (Lotus Domino, Netscape servers and IBM software servers) runs on Windows NT, Warp Server and Unix platforms and reduces scalability constraints. Scalability and high-availability are often assumed to be the same thing; in fact, the former is about maintaining response times as the number of clients increases, while the latter is about ensuring continuous availability of the server for all clients.

Vinca Corporation's new StandbyServer for OS/2 is a high-availability solution for Warp Server. It adds an on-line secondary server which mirrors the primary server and takes over the load if the primary should fail.

Warp builder

Upgrading an ageing 486 system is a perennial concern. Is it better to buy from a major name, or to build your own? Several UK suppliers, such as Adams Technology and Elonex, offer OS/2 support, as do many

of the larger international PC manufacturers.

When it comes to single PCs it's really up to the individual whether to buy or build. Building your own can save money if you already have a number of basic components — but you need to feel comfortable about wielding a screwdriver inside your PC. Some prior research pays dividends, especially if it's carried out on the net since that's where you'll find the best ongoing OS/2 support.

Stick to mainstream components such as ATI, Matrox and Adaptec, and be prepared to reconfigure and re-install a few times until you get it right. If you have to mix plug-and-play and ISA components in the system it can get tricky, regardless of the operating system.

I have seen no evidence of incompatibility in current non-Intel CPUs, but I would use Intel simply because the price/performance difference doesn't favour AMD or Cyrix. Be wary of older CPUs. Mark Davies says his IBM Valuepoint with IBM Blue Lightning DX2 66 chip "does not let Warp shut down or reboot". Swapping the chip for an Intel 486/33 fixed the problem, which was then reproduced on the system into which the Blue Lightning was transferred.

PCW Contact

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Cyber-shop till you drop

Tim Nott gets on the net to download a basket of the latest add-ons and updates for Office and Word. Then it's time for some background bliss and controlling overactive scrolling.

We live in exciting times. There seems recently to have been a rash of add-ons and updates for Microsoft Office in general and Word in particular. Being in the unusual position of having an internet connection that was running at a decent speed the other day, I went shopping.

First on the list was the MS Office Service Release 1. This consists of a 7Mb self-extracting, self-installing patch, Sr1off97.exe, from www.microsoft.com/msoffice/. Do read all the information there before downloading, as different patches apply to different versions.

Although it's big, it's rather difficult to ascertain what exactly Sr1off97.exe contains. There are some improvements to Outlook and a snapshot add-on to Access, neither of which need detain us further, fortunately. The big news is the converter that saves DOC files in real Word 6/7 format, instead of RTF. But as I reported in my September column, this is already available for a mere 600Kb download. And despite having created a new Word executable for the various DLLs, it all seems much the same.

There were several things for which I had been hoping, but taking one at random (an update to the Windows QuickView utility to be able to cope with Word 97 files) resulted in the first of several disappointments.

Quick on the Draw

The next download was rather better. You may remember the MS Draw applet, a minimalist vector drawing applet that originally came with Word 2. If you don't, you haven't missed much. It only works as an OLE server, so you cannot run it on its own, and the facilities are very basic.

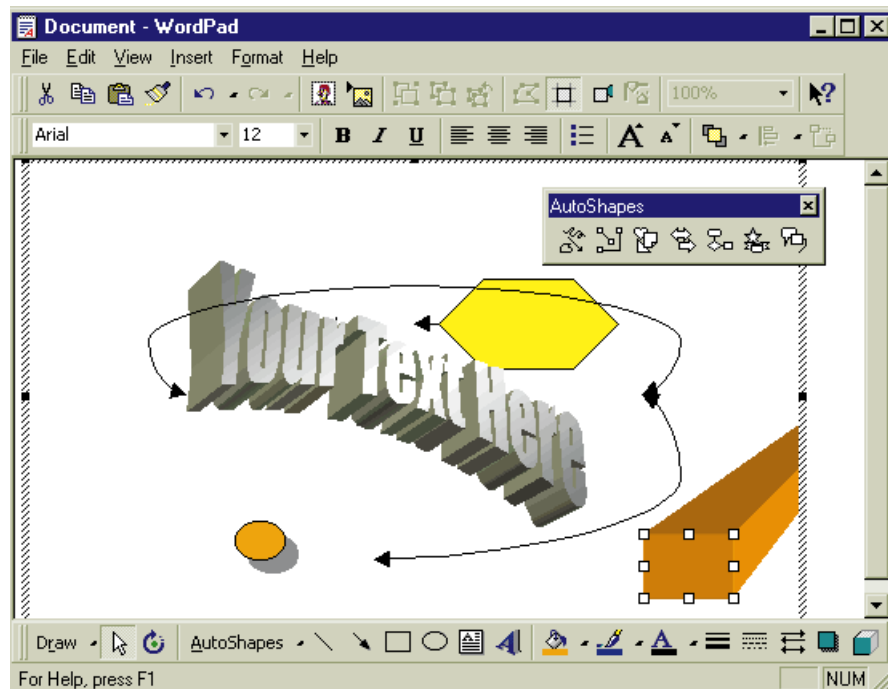


Fig 1 Drawing in Wordpad: At last it can be done, but only if you have Office

Nevertheless, it continues to ship with products such as MS Publisher 97, which I found rather a disappointment after having played with the wonderful drawing tools in Office 97.

The good news is that the Draw applet has been updated: it now provides all the Office drawing tools as well as some new ones of its own to any OLE-aware application. The new tools are connector lines — lines that stay attached to shapes as the latter are moved around, as seen in flowcharting or circuit-drawing applications — and there are a variety of rectilinear and curved ones with or without arrows.

The catch is that it's only available to Office 97 users — you have to fill in an electronic form giving your Office CD-ROM

key number before you are allowed to download Draw97.exe.

Toys and us

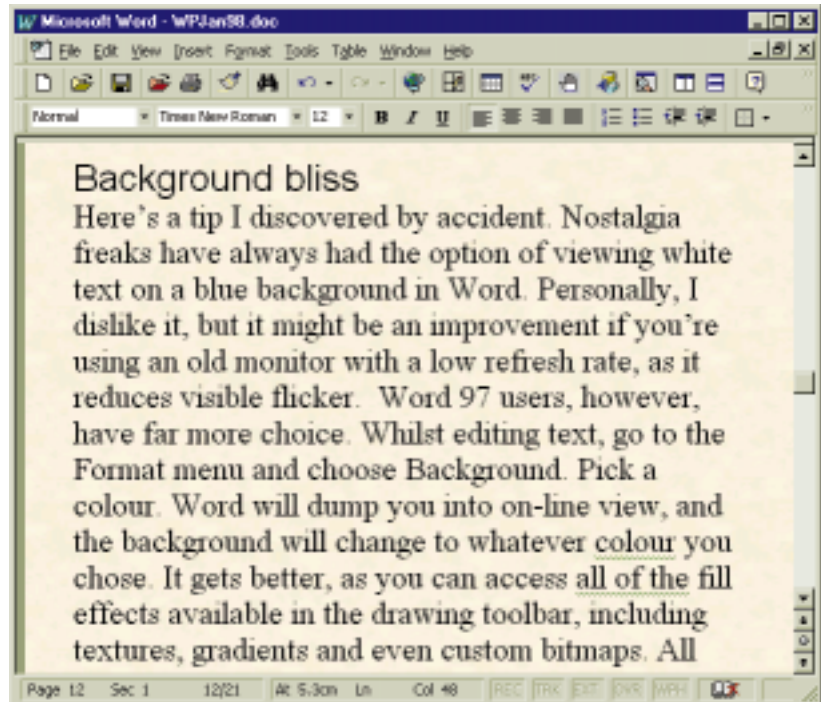
Third in the line isn't from Microsoft, or even the US, which is a refreshing change. Office Toys 97 comes from my adopted country, France, although it's all in English. You may remember a set of macros for Word 6 called Megaword. This added a raft of enhancements ranging from the supremely sensible, such as project and view managers, to the delightfully frivolous, such as a CD-player and bio-rhythm generator. Office Toys (which despite the title is all Word-related) comes from the same stable — Merlot International. This time, sad to relate, there is less frivolity, but the impact

Background bliss

■ Here is a tip I discovered by accident. Nostalgia freaks have always had the option of viewing white text on a blue background in Word. Personally, I dislike it, but it might be an improvement if you're using an old monitor with a low refresh rate, as it reduces visible flicker. But Word 97 users have far more choice.

While editing text, go to the Format menu and choose Background. Pick a colour. Word will dump you into online view and the background will change to whatever colour you chose. It gets better, because you can access all of the fill effects available in the drawing toolbar, including textures, gradients and even custom bitmaps.

All great fun, but there is a serious point to this. On one hand, I find it far more restful on the eye to have a non-white background when typing. On the other, I prefer a white background for other applications, especially graphics, so changing the global window colour from Control Panel isn't the answer. At the moment I'm using the parchment-like texture, and very restful it is too. It seems also to alleviate the scrolling problem (see below) because the overhead of displaying the bitmapped background slows down the scrolling speed.



Typing with a background — easier on the eye

on the Word environment is just as exuberant, with two new toolbars, two new menus and lots of additions to the existing menus. One thing that immediately endeared me to it was that the installation routine (Fig 2) stated exactly what files it was going to stick where.

Taking a lightning tour through the features, there are Managers for almost everything, including: viewing options, printing envelopes, setting up different users on the same Word installation, and tweaking a variety of Word options. The Navigator menu lets you group documents into projects, run Wizards and define a subset of your templates as "Favourites". It lets you create shortcuts to the current document elsewhere on your system and set a different location for backup copies. There's a new Style toolbar, which complements Word's "by example" drop-list with a cascading menu listing all the style parameters.

Then there's a tabbed palette of favourite symbols. There's Autopilot (Fig 3, p278) which can carry out 21 different commands as a batch process on a file, and there's a lot more, but you're going to have to wade through the 43-page user guide to find it, as I don't have room here.

Office Toys costs 240 francs, and there's an evaluation version you can try free for six weeks. Be warned that the registration reminder you get on startup changes to hourly after the first 15 days.

Office Toys didn't last that long for me because wonderful though it all is, there's little I actually need. But some might find just what they're looking for.

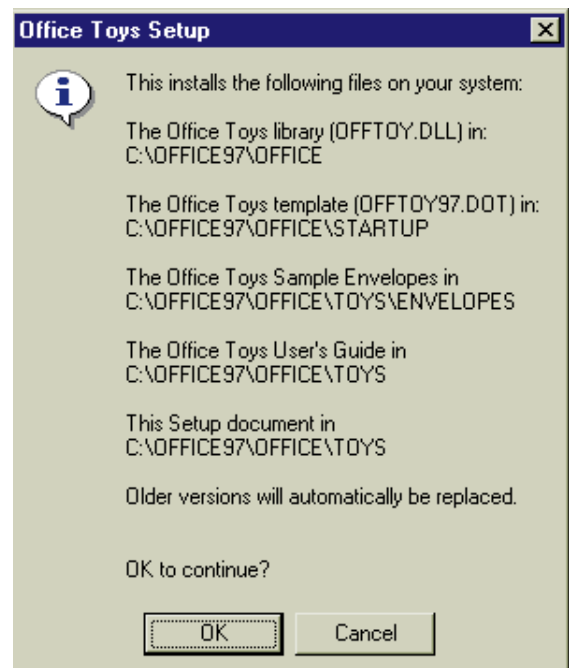
Out of control on the scroll

David Hills writes: "I find it impossible to use mouse dragging to select a large amount of text in Word because as soon as the cursor reaches the bottom of the screen, the auto-scrolling is far too quick to control. I have on many occasions watched the desired end-of-selection point rush past me first one way and then the other — reminiscent of a Buster Keaton slapstick routine. I can resort to keyboard methods to extend the selection but I would be very interested to learn of any 'rev-limiter' which could be implemented."

So would I. I've been moaning about this for some time — well, ever since I upgraded my graphics card to a Matrox Millennium. I'd hoped they'd fix it in Word 97 but they didn't. I further hoped it would be sorted in the Office 97 service release.

Fig 2 Now that's what I call well behaved

It isn't. I've had a good look around the MS Knowledgebase using various Boolean combinations of Scroll, Speed, Selection and Too Damned Fast, but all I could find was advice on the converse problem — how to increase scrolling speed. So, by a simple process of reversal, my advice would be to rip out that flashy display card and downgrade to something less ostentatious. If that doesn't do the trick, try removing some RAM or switching to a slower processor. As a temporary



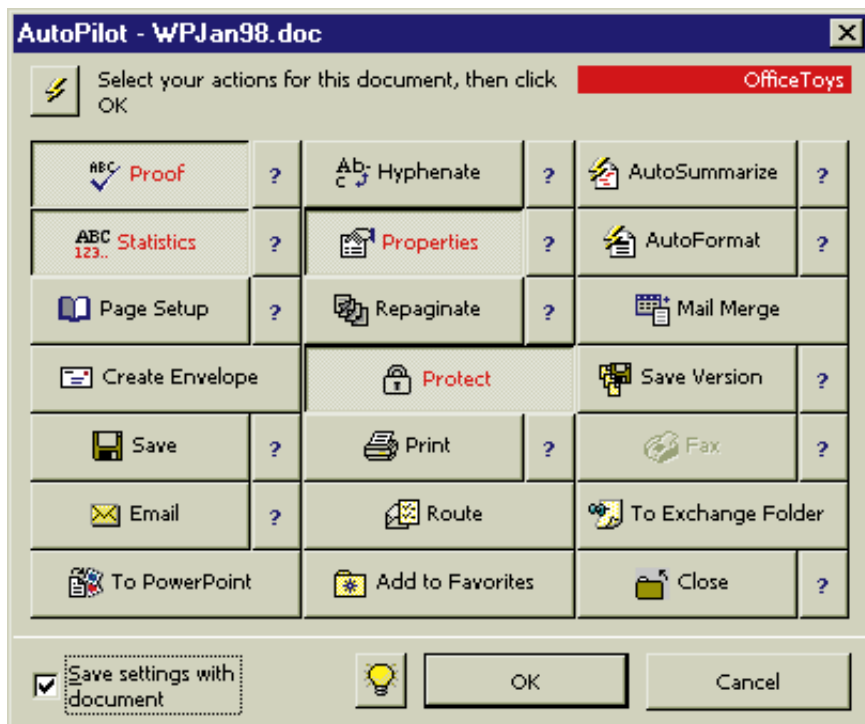


Fig 3 Office Toys AutoPilot — fasten your seat belts

to throw the right amount of money in the right direction.

Enter ClickBook, a \$49.95 utility from ForeFront which claims to cope with all kinds of booklet production, with 30 predefined templates. It's available for Win3.1, Win95 and Mac, with a Windows NT version on the way. The best thing about it is that it's application independent. You install it as a printer driver where it intercepts output from any application, giving you a vast range of options before sending the job off to any physical printer you have installed and hand-holding you through the tricky business of getting the paper in the right way round.

You can't edit text at this point, so you have to get page numbers (say) sorted out in the application. There's an evaluation version available as a free download and I was impressed by the range of possibilities.

I wasn't so impressed by ForeFront's definition of "evaluation" which means it sticks a message in the centre of each page, rendering the latter unreadable. I call that wasting paper rather than evaluating, and it's a pity ForeFront couldn't find some other way of limiting the test version.

workaround, try sticking a large bitmap between each paragraph.

Getting serious, the Microsoft wheel mouse does overcome this problem as you can spin the wheel to precisely control scrolling. I'm not suggesting for a moment that there is any conspiracy here between the developers of Microsoft Word (and also Excel, where it's even worse) and the marketers of the Microsoft mouse. Remember, this is the lot who couldn't conspire to get the wheel to work in the Open and Save dialogs of Office 97. Which is yet another thing that isn't fixed in the Office 97 service release.

What an imposition

One old favourite that never goes away is the problem of printing booklets — or imposition, to use the posh name.

For those who missed out on last April's exciting episode, the challenge is to take an existing document and format it so that it prints two A5 pages side by side on a sheet of A4 paper, which you then fold down the middle to make a booklet. The difficult bit is getting the page order right: with one sheet you want pages 2 and 3 on one side, and pages 4 and 1 on the other. With two sheets it is pages 2 and 7, 8 and 1, then 4 and 5, 6 and 3... I think.

After that you need a computer or something to work it out, which is about where we came in. At the time, we had a free Word macro from Microsoft that didn't

work properly and a manual method, of my own devising, that did work but needed four runs through the printer and was diabolically easy to cock up.

The June issue column brought the good news that it is all a lot easier in WordPerfect or with a Panasonic laser printer. Since then I have had various other Word macro solutions drifting in from readers, which have lain peacefully in my "Must do something with this one day" folder. But recently a query from John Higson prompted me to do that something.

There were a variety of macros: some just automated the process of getting the page-numbering right, others set up the whole business. After disqualifying all those that set the printer whirring into action without a chance to preview the document, I was left with one. This was a reworking of the original Microsoft macro, from David French in Portugal. It still won't cope with tables (as it works by using them) but it seems reasonably robust and does give you the chance to preview before you print. I hope David's ingenuity extends to figuring out how to spend a British book token in Alqueidão da Serra.

The macro is on our cover disc in the BOOKLET.DOC file, with some explanatory text. To use the macro, copy and paste it into the WordBasic macro editing window. (Sorry, 97 users, this one's for Word 6/7.)

One tried and tested solution to any problem is to throw money at it. The trick is

Odds and ends

■ Thanks to David Dickson, John Savard and others who pointed out my error in October's bit about the Forsyth-Edwards Notation for chess positions. I wrote that it was not case-sensitive but I had given my brain the afternoon off. Of course it is; that's how it distinguishes white pieces from black!

■ A quick question from Oliver Fuller: "Word 97 appears to open with a default view of 'Page layout'. How can I change this default to 'Normal'?"

Here's a quick answer: as far as I can make out, Word remembers the last view setting and the zoom for each document. To change the default for new, blank documents, what seems to work is to create one and change to the settings you want, then save the document, and exit.

PCW Contacts

You can contact **Tim Nott** by post via the usual PCW address (page 12) or at wp@pcw.co.uk

ClipBook trial and full versions www.ffg.com
Office Toys www.officetoy.com



Data dump

Stephen Wells explains how to download from the internet in a form that enables you to easily get rid of unwanted data. And, go on... make progress with a simple Gantt chart.

Reader Mike Liversedge emailed me recently, asking: "I am attaching an Excel 5 file that contains share data copied from the internet. How can I automate my sheet so that it gets rid of unwanted data (i.e. all text except today's 'bid price') so that I can construct charts?"

I sent Mike a new version of the file, still in Excel 5 format but separated into columns and with a little added formatting. What I did was to save his file as a .txt file, then open it again in Excel. This starts the Text Import Wizard. I chose the option for

Fig 1 A web page of oil stock prices as downloaded into Excel. Now it needs sorting into columns

Fig 2 If you save Fig 1 as a text file and then open that file with Excel, it starts the Text Import Wizard which does the job

data separated by spaces (rather than commas).

To make the other changes, start the recorder, hold down the Ctrl key and click on the columns you do not want. Then press delete, stop the recorder and name your new macro. As long as they always publish the page in the same way, and you save it as a .txt file and then open again in Excel, your macro will work.

Mike replied: "Thanks for your rapid response.

Guess what — it works OK! The only limitation, however, is (as you pointed out) making sure that data is aligned as before. I did not even know about the importing wizard until now. At least doing it this way is free. Thanks."

Of course, Mike does not have to eliminate the other columns in order to make a chart. He only has to hold down Ctrl and click the heading letter of the two columns he needs, and press F11. The result is an instant chart.

Another solution to Mike's problem is that many web sites, which intend for you to download their data into Excel, provide a web query form tailored for their pages. You can always email the site to ask if they have one. These forms download the data into columns.

In the Software section of this month's CD-ROM, under Hands On Spreadsheets, there is a file named queries.exe. If you have Excel 97, you can double-click on this and it will install web query forms on your hard disk for you to use. You could

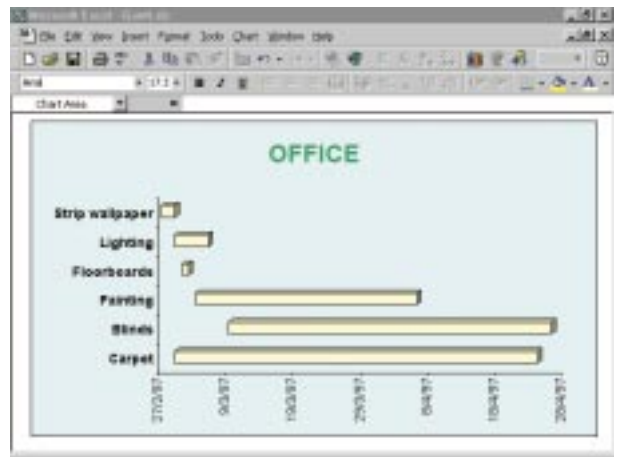


Fig 3 It is easy to make a simple Gantt chart for small project management jobs. Excel 97 has a built-in type which suits

also consider Microsoft Investor 2, which includes tools for downloading stock data.

Making a Gantt chart

If you were going in for project management in a big way, you would use a package like Microsoft Project, but you can quickly make a simple Gantt chart with Excel 97. The planning and progress chart devised by the American, Henry L Gantt, can be simulated with one of Excel's built-in charts.

Start by listing in a column on a worksheet, the jobs to be done. In the example (Fig 3) I've used half-a-dozen activities that might be required to redecorate a room. In the adjacent column, list the start dates for each job. In the next column, enter the number of days the job is expected to take. This could be calculated if you enter the anticipated end dates in a column away from this three-column range.

Now select this range, including headings. Here, it is A1 to C7. Click the Chart Wizard tool. Select Custom Types, Floating Bars and choose the Built-in

XLS How-To

■ Neat names

How can I quickly rename a sheet tab?
Double-click the tab, type the new name. Press Enter.

What's the quickest way to create a Name?

Select the cell or range. Type the Name in the Name Box, which is on the left-hand end of the formula bar and normally displays the address of the active cell. Press Enter. (If you do not press Enter, the Name is not created.)

■ Hot dates

How can I quickly make a column of dates that show the 15th of each month?
Enter 15/1/97 in the first cell. Drag the fill handle down the column using the right mouse button. On the shortcut menu which appears, click Fill Months.

How can I show the current year in Roman numerals?

Nest three functions like this:

```
=ROMAN(YEAR(NOW()))
```

This year, it will read as MCMXCVII = 1997. (Cover date is 1998.)

What's the fastest way to add a series of dates to a worksheet?

If there is an existing column of data to the left or the right, you can enter the date (Ctrl+; gives you today), select the cell, then double-click the AutoFill handle at the bottom right of the cell. The dates will run down consecutively as far as there is data in the adjacent column. Or a label can be repeated instantly the same way.

■ Smart moves

How can I quickly move between sheets?

1. To switch to the sheet on the left, press Ctrl+PageUp. To switch to the sheet on the right, press Ctrl+PageDown.
2. To rifle through the worksheets, hold the mouse down on the arrows to the left of the tabs.
3. To see a menu of the sheets, right-click

one of the arrows.

How can I move through my workbook, going to the same cell on each workbook?

In the first sheet, select the cell you want to land on each time. Then right-click on the sheet tab and choose Select All Sheets on the Shortcut menu. Then press Ctrl+ PageDown (or PageUp to go through the sheets the other way), then Ctrl+Backspace.

How can I move to the last cell with data in a column when there are numerous blanks in the column?

Click the column letter. Press Shift+Enter. Press Ctrl+Up arrow.

■ Nice views

How can I view two worksheets, side by side?...

Choose Window, New Window. Then Window, Arrange, Vertical.

... and how can I reverse those two Windows?

Click the sheet on the left, then the one on the right, then Window, Arrange. That is, select the worksheets in the reverse order to which you want them to appear.

■ Tool tips

How can I make space on the Standard toolbar for another tool?

Because you can print either by pressing Shift when you click the Preview tool, or see a preview when you press Shift and click the Print tool, you do not need both.

To remove one of them, choose View, Toolbars, Customise. Then, on the actual Toolbar on your worksheet, drag the redundant tool off the top of the screen. Click Close in the dialog box.

How could I add another tool to a toolbar?

Choose View, Toolbars, Customise. Choose the Commands tab, then drag the tool you want out of the Commands box and onto the actual toolbar on your

worksheet. Click Close.

Is there a tool for adding Comments to cells?

Yes, and it's versatile. If the cursor is on a cell without a Comment, clicking this tool opens a box for entering a new Comment. If the cursor is on a cell containing a Comment, clicking this tool opens a box for editing it. I frequently add Comments to my own worksheets to remind myself why I made certain entries.

■ Display-away

In cell L2, I enter a number from 1 to 7. I'd like it to display as the day of the week, and in cell A2 as an abbreviation of that.

Format cell L2 by choosing Format, Cells, Number, Custom and in the Type box enter dddd. In cell A2 enter =TEXT(L2,"ddd"). If you now enter 2 in L2 that cell will display Monday, and cell A2 will display Mon.

How can I display my formulas so I can print them?

Choose Tools, Options, View and check the Formulas box. In Excel 97 the column widths will automatically expand to show the formulas. When you uncheck the box, the widths will retract to their original position.

■ Bits and pieces

How can I count the number of negative values in a range named TEST?

Use the COUNTIF function like this:

```
=COUNTIF(TEST,"<0")
```

What's the fastest way to copy data from the cell above?

Select the new cell and press Ctrl+Shift+, (comma).

How can I create a column of labels that read Product 1, Product 2, and so on?

Just type Product 1 in the first cell and drag down the fill handle. You can use any word and Excel will increment the number. The number can also be in the middle of a phrase, like: Product 1, Northern Region.

option. The Wizard will tell you that this type uses two series: the first to specify the beginning of the bars (in our case, the start date), and the second, the length of the bars (the number of days for the job). You

can add a title (here, Office) in Step 3 of the Wizard and you can choose where to display the chart in Step 4. Now it is just a matter of reformatting until you have the design which suits you. You can right-click

on the chart area and choose Format Plot Area to change the colour and pattern of the background. Right-click on each axis to reset the alignment of the labels and their font size, weight and colour. On the Scale

tab for the vertical axis you can check the Categories In Reverse Order box so that the jobs are listed from top to bottom, like your worksheet. On the Scale tab for the horizontal axis you can change the start date of the scale, although it is shown as Excel's underlying number (for example, 35488 is 27/2/97).

That's all there is to it. This simple chart and its worksheet are on this month's PCW cover disc in the file, Gantt.xls.

A picture is worth 1,000Kb

Bill Watson writes: *"I have built a spreadsheet in Excel 97 which constructs tables based on input variables. In the original file format it saves as a 442Kb file. However, when I use the suggested 'Save As Excel 97 & 5.0/95 Workbook *.xls' format to transport the file to another PC running version 5.0, the file size increases to a whopping great 9,855Kb. Can you tell me whether this is only to be expected? If not, what is happening?"*

I asked Bill if there were any VBA macros in the original workbook and suggested he make a spare copy of the original file in Excel 97 format, delete half of it, save that in the Excel 97 & 5.0/95 Workbook *.xls format and then tell me the size.

He replied: *"No, there are no macros. I removed two of the four worksheets from the model, then, saving in the Excel 97 & 5.0/95 Workbook *.xls format, the new file size is 9,755Kb, although I noted that the Excel 97 file size had reduced to 382Kb before I saved it in the new format."*

Having looked up file sizes in the Excel Knowledge Base, I suggested he delete any blank worksheets, then choose Properties, Summary, and uncheck the Save Preview Picture box and click Save. Also, to make sure the Zoom setting is 100 percent or more before saving.

Finally the penny dropped. Bill responded: *"I tried the solution suggested in your last note and still saw no difference, but the solution to the problem at last dawned on me. I had embedded two scanned company logos in the sheet and when these were removed, the file size shrank back to normal. Sorry, I didn't think of this before. Thanks for the trouble you took to assist me."*

Well, we both learned something. Apparently, whether an embedded bitmap is a preview picture or one's own illustration, it is saved in a compressed form in Excel 97 but not in the dual-format type of file.

Quick looks at new books

■ Step by Step — Microsoft Excel 97 Advanced Topics by Reed Jacobson

Personally, I think that if Microsoft actually listened to its customers as carefully as it claims to, it would go back to providing proper documentation of its products' features as it did with Excel 4: for instance, imagine owning a car for a few months and then stumbling across a valuable "undocumented feature".

Microsoft Press obviously agrees that there are many users who like to sit down with a good manual, or else they wouldn't feel the need to publish excellent books like this one.

Excel 97 beginners will want to start with the companion *Step by Step Microsoft Excel 97*. This more detailed version is accurately sub-headed the *Advanced Self-Study Kit* and each chapter is one of a course of lessons. There are sample files with which to work on the accompanying floppy disk and virtually every page has an illustration.

If you've ever wanted to know more about using names in formulas, nesting functions, sorting and sub-totalling lists, or publishing Excel worksheets with pictures, creating complex charts and maps, sharing workbooks with remote users, or creating and editing Visual Basic macros, then this is the book to turn to.

I've certainly learnt a lot I didn't know before about Excel. For instance, when you start the PivotTable Wizard it looks for a range named Database, so if you select the range you want and enter that name in the Name Box first, you save time. And I like the organisation of this book: at the end of each chapter or lesson there is an itemised summary with a "To" column and an adjacent "Do This" column.

This fact-packed 336-page book, with the 3.5in floppy disk of sample files, is good value these days at £27.99. It is available from Computer Manuals (see "PCW Contacts").



Column conundrum

Sture Olsson asked about a formula I included in my September column for finding the address of the cell containing the highest value in a range. He says he can only make it work in a one-column range and would like to make it work in a two- or three-column range. Microsoft in Stockholm couldn't help him.

This was my fault. I got this formula from the Microsoft people and they said it would work in any range. However, I only checked it in a one-column range. I have now found that it only works within that parameter.

If any reader has a solution for Sture, please let me know and I'll pass it on.

Links and high values

Andrew Johnson writes: *"I have a large Excel 7.0 workbook with many sheets. Many of these sheets have been copied from other workbooks. When I load the workbook, the message appears: 'This document contains links. Re-establish links?' The links in question point to*

external files which are no longer available. There should be no external links in this workbook, anyway. There seems to be no way in Excel to find where these links appear in my workbook."

I pointed Andrew to the file, LinkMacro.txt, on our November cover-mounted CD-ROM or, if this were not to hand, suggested that he download the file himself from the Microsoft Knowledge Base. He replied: *"Thank you. I was able to download the macro from the Knowledge Base and run it successfully. Although for some reason it could not delete them all, it did point me to the cells which contained the links it couldn't delete and this allowed me to delete them manually."*

PCW Contacts

Stephen Wells welcomes problems, solutions or suggestions relating to spreadsheets. Write to him at the usual PCW address (see p12) or email spreadsheets@pcw.co.uk.

Computer Manuals 0121 706 6000
www.compman.co.uk



Tricks and **treats**

Mark Whitehorn lets you in on some secrets for writing Visual Basic code in Access and unravels the mysteries of string manipulation. He tackles your knotty problems as well.

In my November column, reader James Talbut proposed a way of formatting dates using ordinal numbers ("Monday 2nd June 1997") but wondered if there was a faster or more elegant solution. Anyone care to speed-test these two suggestions and report back?

1. Wilf Davies sends in one possible solution, shown in Fig 1.

2. The other, shown in Fig 2, from Ray Hall is certainly more elegant but I don't know if it's quicker. There are fewer comparisons but I don't know how much overhead is carried by the Case statement. Declarations as printed, except sRetVal.

Writing code in Access

This month, by popular request, we're going to have a look at some tips and tricks for writing Visual Basic code in Access. This is going to be based on Access 97. I am aware that lots of readers are still using Access 2.0, but the coding languages of the two versions are somewhat different and I had to choose one or the other, so I went for the later version.

■ How to start programming in Access

There are many ways to get started but this is probably the easiest. Start in a database that has a few tables of data (if the data has any value to you, make sure you are working with a copy. There is a sample database on our cover-mounted CD-ROM this month which provides some samples that you can use in safety).

Create a blank form and open the toolbox. Make sure that the control Wizards are turned off and then place a button on the form (Fig 3). Right-click on the button, select Build Event, choose Code Builder and you are ready to code (Fig 4). Whatever

code you write will be carried out (executed) whenever the button is clicked.

■ String manipulation

Strings are long sets of characters. For example, the characters in this sentence make up a string. Indeed, all of the characters in this paragraph make up a larger string. Programming languages in general, and Visual Basic in particular, have functions which are designed to manipulate

strings. We'll have a look at three.

1. How to find the length of a string

Len(string) will tell you the number of characters in a string. For example:

```
Length = Len("Penguin
and his friend.")
```

will set the value in the variable Length to be equal to 23. Of course, there is nothing to stop you setting the value of, say, a text box on a form to be equal to the length of a

Fig 1: Wilf Davies' solution

```
Public Function OrdinalDate(DateIn) As String
    Dim DayNo As String, Ordinal As String
    If IsNull(DateIn) Then Exit Function
    DayNo = Right$(Str$(Day(DateIn)), 1)
    Select Case DayNo
        Case "1"
            Ordinal = "st"
        Case "2"
            Ordinal = "nd"
        Case "3"
            Ordinal = "rd"
        Case Else
            Ordinal = "th"
    End Select
    OrdinalDate = Format$(DateIn, "dddd d") & Ordinal & " " &
    Format$(DateIn, "mmm yyyy")
End Function
```

Fig 2: Ray Hall's solution

```
Dim Suffix As String
Select Case iDay
    Case 1 To 3      Suffix = vOrdinals(iDay)
    Case 21 To 23   Suffix = vOrdinals(iDay Mod 10)
    Case Else       Suffix = "th"
End Select
FormatDate = Format(dArg,"dddd, d") & Suffix & Format(dArg, "mmm,yyyy")
```

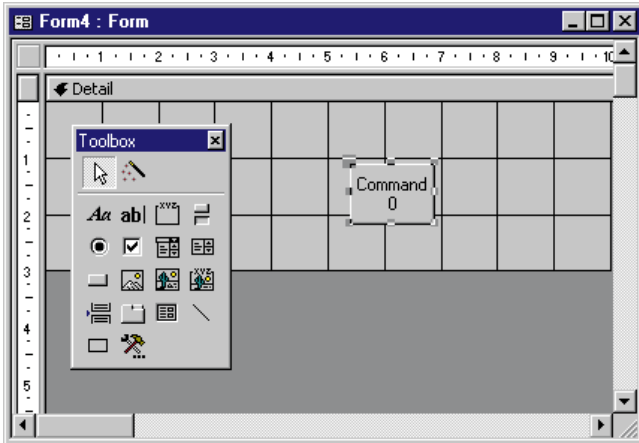


Fig 3 (left) Putting a new button on to a form

string held in a field. Assume that we have a table in the database called Sample and that we have set up rstSample to reference that table. Sample contains a field called Information that in turn holds a string "Penguin and his friend." In that case, the code

```
Text3 = Len(rstSample![Information])
```

will set the value of a text box called Text3 to be 23.

● There are many other tips in this area so I have included them on this month's CD-ROM: see the form called "Remove string from table and manipulate it".

■ How to find the position of a character in a string

InStr is a function that will find the location of a particular character in a string. Thus, Fig 5 will set the value of the text box called Text7 to a value of 2. The 1 tells InStr to start searching at the beginning of the string. Thus, Fig 6 will set Text9 to be 20 because it starts the search at the 3rd character into the string.

■ How to extract a copy of part of a string
Mid is the function we need here. You need to give Mid the string with which you want it

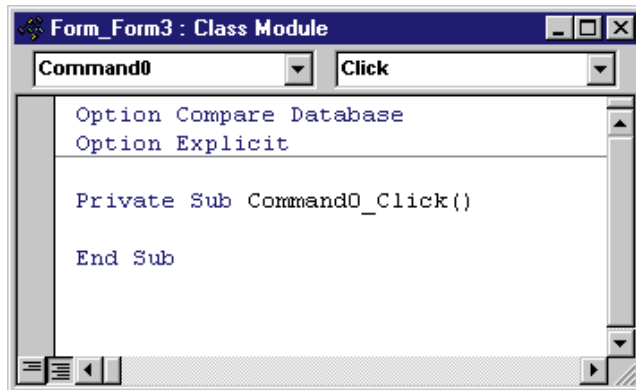


Fig 4 (below) Code written in this window will be executed whenever the button is clicked

to work, the number of the character at which it should start copying, and the number of characters it should remove after that start character. So Fig 7 removes seven characters from the string, starting at the third. So it will set Text5 to be equal to "nguina".

Even though all these functions may

Fig 7

```
Text5 = Mid(rstSample![Information], 3, 7)
```

seem a little abstract at first, the reason I have chosen them is that they all help to answer particular queries I have received from readers.

A couple of more general tips

1. Modifying your start up

Access typically starts up with the words "Microsoft Access" in the top left of the screen (in the title bar). You can configure this to read anything you want: boringly, the name of your application; more excitingly, a

short description of your boss (don't blame me if you get fired). Simply right-click the title bar of the database container (not the title bar of Access itself) and select Startup. In the dialog

Fig 5

```
Text7 = InStr(1, rstSample![Information], "e", 1)
```

Fig 6

```
Text9 = InStr(3, rstSample![Information], "e", 1)
```

Questions & Answers

Q My friend has a DOS database which stores its data in three text files. I've managed to import these into Access 97 (though I did get some field truncations) and now have three tables arranged [as shown in Fig 8]. In practice, the Cross Ref field can contain many more values than are shown here and Access truncated some of the data. Advice on how I can reduce the truncation of the text field would be appreciated: Access would not import this as numeric, presumably because of the commas between items. Also, my friend wants to look up anyone listed under, say, Anteater Supplies and extract the data for Anteater Bedding Inc., Ants R Us, and Everything Anteater Inc., (i.e. items 2, 3 and 4093). Is there a way to link these tables?

Nigel Mercier

A The truncation is easy, but make sure you import the data into a memo field. Memo fields can hold a minimum of 65,656 characters, so that should be enough.

The problem with the data in the "Cross Ref" field is that it is not atomic. That is, a single field in a single record is actually holding multiple individual bits of information. We need to turn the data into the sort of table shown in Fig 9. This can be done by opening up the table called Cross Ref, dissecting the string in the Cross Ref field and building new records in a new table called NewCrossRef. This is a good example of where the ability to manipulate tables with code is really useful. I can't think of a way to do this manipulation using, say, SQL.

A solution using code is available attached to the form called "Solution to problem". Note that this code actually uses a table called CrossRef (no space). This is just like Cross Ref (with a space) but contains a long string so you can see it working on more realistic data. There are three sample text files included on our

cover-mounted CD-ROM so that you can play around with importing if you so desire.

Q What code do I need to manipulate databases?

A Access code uses variables to hold the names of the databases that you are going to manipulate with the code. You declare variables at the start of the code by using the word DIM (DIMension) which implies that you are "dimensioning" or setting up a space to hold information. (If this all sounds like Venesian, don't worry. When you are starting out you can follow the examples and do it by rote.)

So, to gain code-type access to a database you would use:

```
Dim DBCurrent As Database
Set DBCurrent = CurrentDB()
```

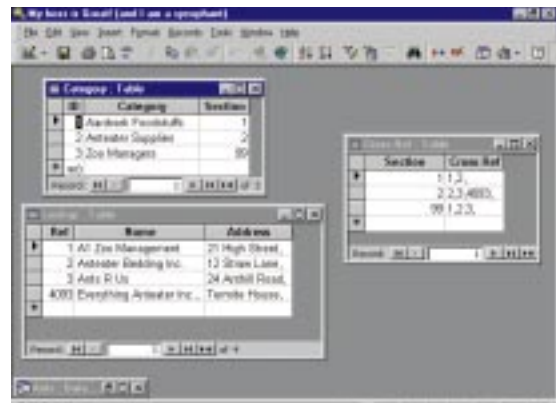
The first line says "set up a variable called DBCurrent and make that variable capable of referring to any database". The next line says "tie that variable name to a particular database, in this case the one which is currently open". Any reference in the code to DBCurrent now automatically refers to the current database.

You can substitute almost any word for DBCurrent since it is a variable name. However, the rest of the words are fixed. This code is demonstrated in the sample database on the form called "Open a database".

Q How do I reference a particular table in a database?

A First of all, you have to set up the database (as shown, above). Once that has been done, you can use a variable to refer to a table.

The variable in this case is often referred to as a record set. Thus:



Section	Cross Ref
1	1
1	2
2	2
2	3
2	4093
99	1
99	2
99	3

Fig 8 (top) and Fig 9 (above) The crossRef field needs to be in atomic format

```
Dim rstCrossRef As Recordset
```

```
Set rstCrossRef = DBCurrent.Open  
Recordset("CrossRef", dbOpenTable)
```

is a long-winded way of saying that from now on, in this block of code, any reference to rstCrossRef is actually a reference to a table called CrossRef in the current database.

This does, of course, assume that the current database contains a table called CrossRef. See the form called "Open a database and a table" on this month's cover-mounted CD-ROM.

that appears you can type the heading of your choice into the Application Title box.

1. Loads a free toys

For those with access to the web, there is a raft of fun free stuff available for Access at www.microsoft.com/officefreestuff/access/. This includes the long overdue Wizard that

lets you print out your relationships without using multiple screendumps and other messy workarounds.

Those with experience of www.microsoft.com will know that you are well advised to download material while America is in the land of nod (approximately 8am to 1pm, our time).

PCW Contact

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. Write to him at the usual PCW address (see page 12) or email him at database@pcw.co.uk



Port of call

Roger Gann takes a look at Intel's Accelerated Graphics Port (AGP) multimedia graphics development. Plus, how overclocking could speed up your CPU — but don't go overboard!

Over the next few months I'll be looking at USB and IEEE 1394, or FireWire, peripheral interfaces. But for now, I'll give you the low-down on Intel's new graphics technology, the Accelerated Graphics Port (AGP). AGP is the third out of four multimedia graphics developments from Intel. It kicked off with MMX, then the Pentium II, and now AGP, and will culminate with Intel's own proprietary graphics accelerator chip, the i740.

Intel's purpose in developing AGP was to improve 3D graphics throughput. Those graphics require far more memory than 2D versions because of the need to store data such as display lists and texture maps, which are particularly memory intensive.

Today's PC applications seldom use a texture map, for the simple reason that's it not practically possible. However, the desire for improved realism, particularly in games, is pushing in this direction. Typical texture maps range from 2Kb to 128Kb. Today's applications average from 12 to 24 different textures of varying sizes in each scene. Thus, each scene generally requires several megabytes of texture-map storage.

To render the many scenes in a 3D application, like a game, at realistic speeds, many texture maps must be readily available in memory. This requirement is incompatible with the current model for 2D graphics on the PC, in which the graphics accelerator stores data in a dedicated frame buffer. Applications may require 5Mb to 10Mb of texture memory, beyond today's typical frame buffer size of 2Mb.

If all the necessary 3D data were kept in a frame buffer based on high-speed RAM, the cost of the additional memory would be prohibitive for mass-market PCs. Dedicating huge amounts of memory solely to the

graphics accelerator is impractical. One solution is to store some of the 3D data in system memory instead. This doesn't decrease memory requirements of 3D but allows other applications to use the memory when 3D applications are not running. The challenge is to enable the graphics accelerator to access system memory fast enough to feed the 30fps rendering that users want.

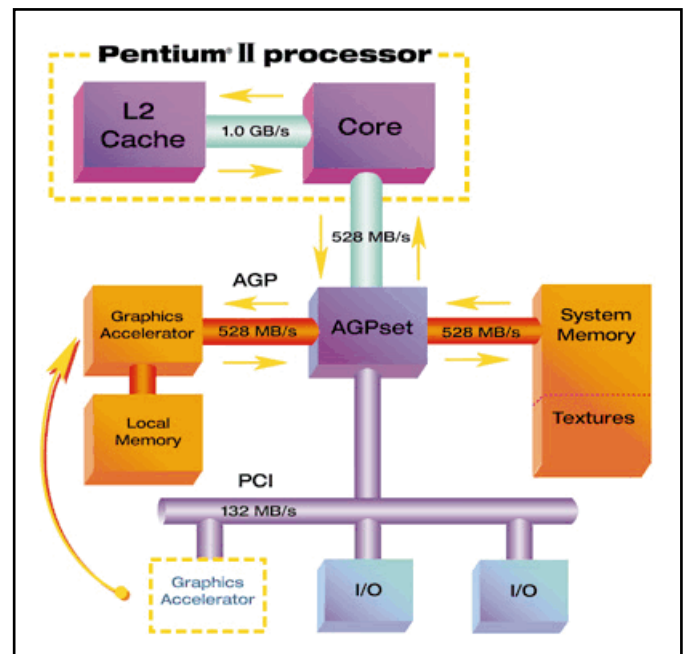
AGP in detail

The AGP specification is based on that of the 66MHz PCI 2.1 which doesn't have much support at present since all current PCI cards can only run at 33MHz. AGP adds three special extensions via so-called "sideband" signals, provided by some special lines added to the PCI connector:

- pipelined memory read/write operations;
- de-multiplexing of address and data; and
- timing for data transfer rate as if clocked at 133MHz.

All this is designed to improve throughput compared with the PCI bus which, at 33MHz, can deliver 132Mbps at peak rates over its 32-bit data bus.

This bandwidth has to be shared with



Diagrammatic representation of how AGP works

other peripherals and it relies on a slow software-based method for moving large blocks of data to the frame buffer. Because the typical texture map is stored in small, non-contiguous memory blocks in system memory, many CPU accesses are needed

Intel's 440LX AGPset

- Pentium II systems only.
- Supports AGP.
- Supports ACPI for remote management, quick boot-ups.
- Ultra DMA for better access to IDE hard drives and CD-ROMs.
- SDRAM for faster communication between CPU, graphics accelerator and PCI devices.
- Supports AGP OS and apps software. Drivers and controllers due 1998.

to retrieve the entire texture map.

The AGP bus runs twice as fast, at 66MHz, and so is capable of a peak rate of 264Mbps. This is in the so-called classic "x1" mode. However, if the "x2" mode is used, which transports data on both the rising and falling edges of the 66MHz clock, the data transfer rate can be redoubled to a theoretical peak rate of 528Mbps. As a result, the AGP peak transfer rate matches that of main memory which, in Pentium or better systems, operates with a 64-bit wide bus at a 66MHz-bus clock.

Thanks to the high data transfer rate between the graphics accelerator and main memory, AGP enables 3D graphics accelerators to use main memory instead of local memory to store texture data. These textures, previously loaded into the local graphics accelerator memory, can now be processed in main memory without a performance impact. Intel calls this technique DIME (Direct Memory Execute).

Most applications could use 2-16Mb for texture storage — by using AGP and DIME, they can get it. The main beneficiary of AGP will be high-end 3D graphics applications and games. Normal business applications will not benefit at all.

AGP hardware

AGP consists of a proprietary expansion slot and the Intel 440LX AGPset, although an "any-processor" Socket 7 solution is imminent from motherboard manufacturer, VIA. The AGP slot is very similar to the existing PCI slot but located further back from the rear of the motherboard to prevent inadvertent insertion of non-AGP cards.

The 440LX features Intel's Quad Port Acceleration (QPA) which increases overall system concurrency, bandwidth and performance. The QPA includes the direct connect AGP, dynamic distributed arbitration and multi-stream memory access. The AGPset also offers Advanced Configuration Power management Interface (ACPI) for enhanced power management and plug-and-play capability, Ultra DMA for faster storage throughput and SDRAM for increased RAM performance.

At present, AGP support is lacking in Windows 95 and Windows NT 4.0, so all you get with AGP is a faster data transfer rate and no DIME support. This support will arrive via DirectDraw in Windows 98 and Windows NT 5.0 next year. Parts like the direct pipeline from the graphics accelerator to system main memory would be

unaffected by the absence of OS support, but a major portion of AGP functionality, like the dynamic memory allocation required to allow video to peacefully co-exist with Windows in the same RAM space, would be missing without this support. So, Intel has designed a DirectX 5.0 software driver that will enable its AGP silicon to work with the current version of Windows 95, rather

Advantages of AGP

- Up to four times the bandwidth of PCI.
- Exclusive graphics bus.
- DIME; Direct Memory Execution of textures.
- CPU accesses to system RAM can proceed concurrently with the graphics chip's AGP RAM reads.

than waiting for Windows 98. Rumour has it that Intel postponed the launch of the 440LX chipset when it became apparent that the increasingly later release of Windows 98 would largely render the 440LX's launch meaningless.

Overclocking

I've had a couple of letters asking about processor overclocking and whether it is a good idea. Overclocking refers to the process of running your CPU at a clock or bus speed for which the CPU has not been specified; typically a higher speed. In most cases this is achieved by changing a few settings on your motherboard.

Sounds great; but is it safe? The surprising answer, in most cases, is yes. Provided you don't go wild with your overclocking, it will probably run just fine.

The big problem is one of heat: the faster a processor runs, the hotter it runs. Unless the CPU is cooled properly, this can cause the chip to overheat and be damaged by so-called "electro-migration", which is a kind of slow rotting of the silicon. Most chips can safely run at 80° C, which is too hot to touch, but a cooling fan can drop this to 50° or less, so the degradation needn't be a major threat.

This is true of Intel CPUs, which seem conservatively rated. CPUs from AMD and Cyrix are less conservatively rated and run much hotter as a result, so these are less suitable candidates for overclocking. There's far more scope with Intel silicon.

Another problem is that random system hangs can occur after overclocking. Windows 95 is very sensitive for some reason: I installed a faster Pentium in an old

PC and Windows 95 wouldn't load, telling me it couldn't find KRNL386.EXE. Hence, thorough testing of an overclocked system is an important precaution.

Finally, you should not forget the warranty implications: if you overclock, you will probably void your warranty.

There are two motherboard settings which need to be changed to overclock: the bus speed, and the processor multiplier. The Pentium supports three bus speeds (50, 60 and 66MHz) but some recent motherboards additionally offer 75 and 83MHz. To change the bus speed, look in your motherboard manual for something like "CPU External (BUS) Frequency Selection": these are the jumpers which need moving. Go easy here and just move the bus speed up a notch. If you do try the 75 or 83MHz settings, remember that this increases the PCI bus, from 30 or 33MHz to 37.5 or even 41.6MHz. This can lead to several problems with PCI devices like SCSI host adapters, some video cards and network cards. Each CPU uses a multiple of the bus speed — the so-called bus multiplier. A P120 uses an X2 multiplier on a 60MHz bus and a P166 uses an X2.5 multiplier on a 66MHz bus. Intel Pentium CPUs support the following multipliers:

Overclocking ingredients

- Intel Pentium processor.
- Good-quality motherboard, capable of 75MHz or 83MHz bus speed, supporting a wide range of CPU supply voltages (overclocked CPUs need more juice).
- Good-quality RAM; fast EDO SDRAM.
- Decent CPU fan plus good heatsink.

X1.5, X2, X2.5 and X3. Intel Pentium Pro CPUs support X2.5, X3, X3.5, and X4.

To change this setting, find something like "CPU to BUS Frequency Ratio Selection" in your motherboard manual. For example, a P200MMX in the right motherboard can be made to run at 233 or even 250MHz. On the power supply front, merely switching from STD to VRE is often sufficient, but try increasing the voltage if the original settings do not work.

PCW Contacts

Roger Gann can be contacted by post c/o PCW at the usual address (p12) or via email at hardware@pcw.co.uk.



No strings attached

Steven Helstrip and Rob Young continue their teach-in on realistic MIDI recordings by showing you how, with patience, you can create an authentic-sounding rhythm guitar part.

However hot your keyboard-playing skills, the rhythm guitar is one of those instruments that cannot merely be recorded in real time from a keyboard and considered as finished. Editing will always be needed to create an authentic sound, almost to the point of dumping the keyboard and step-recording the parts from scratch. But there's no great mystery or complication to creating realistic rhythm guitar parts: all it takes is patience, persistence and some knowledge of how the instrument is played.

With any rhythm guitar part it helps to have a few bars of drums and bass already recorded (when we start editing the timing of the notes, it's hard to tell how well it's going against a plain metronome beat).

We're concentrating on creating a simple rhythm that will sound best using an acoustic or a clean electric guitar patch (try patch 26 if you have a General MIDI sound source). All we're aiming for is a straight eight-beat rhythm (eight quavers on a chord of E major).

This is where some knowledge of string tunings comes in handy: guitar strings are tuned to E1, A1, D2, G2, B2, E3 from lowest to highest, assuming that your sequencer refers to Middle C as C3. Each of these strings can be raised in pitch by placing fingers on frets, so our E chord would consist of the notes E1, B1, E2, G#2, B2, E3.

How to do it

1. Set up your guitar patch and cue up to record a single bar. Don't worry about note velocities, feel, or trying to "sound like a guitar" as you play, but try to play all six notes on each quaver chord. You probably won't keep all these notes but it's quicker to delete the ones you don't want later on,



Start-Pos.	Length	Val.1	Val.2	Val.3	Status
0002.04.364	428	A1	127	127	Note
0002.04.376	84	D3	127	127	Note
0003.01.004	372	C3	109	109	Note
0003.01.016	360	G3	109	109	Note
0003.01.064	308	E3	91	91	Note
0003.01.372	24	E3	118	118	Note
0003.01.376	24	C3	115	115	Note
0003.01.380	24	G3	123	123	Note
0003.02.164	428	A1	115	115	Note
0003.02.172	396	C3	115	44	Note
0003.02.184	288	E3	105	105	Note
0003.02.204	264	G3	109	109	Note
0003.03.088	104	G3	102	102	Note
0003.03.092	96	E3	92	92	Note
0003.03.184	24	C3	107	107	Note
0003.03.188	24	E3	92	92	Note
0003.03.192	24	G3	114	114	Note
0003.03.368	196	C3	112	112	Note
0003.03.380	280	E3	107	107	Note
0003.04.000	184	G3	109	109	Note
0003.04.184	180	C3	76	76	Note
0003.04.188	92	G3	95	95	Note
0003.04.280	84	E3	75	75	Note
0003.04.284	80	G3	82	82	Note

Above A typical single-bar rhythm guitar part in Cubase's list editor

Left Chained single-bar guitar parts on channels 1 and 3, each starting on tick 364

rather than insert the missing ones.

2. Move the single-bar part you've just created so that it starts on about tick 364 of the previous bar (assuming a sequencer timebase of 382). This is very much a rule of thumb, and you'll want to vary it according to the style and tempo of the song, but a guitar part will rarely sound good starting on the first tick of the bar.

3. Next, we need to create the alternate upward and downward strums. Accented strums are downward, which means that the first, third, fifth and seventh chords we recorded will play the notes in order from E1 up to E3, and those in between from E3 down to E1.

Another two rules of thumb: remove the three lowest notes from the upward strums and the two lowest from the downward strums that occur on the second and fourth beats of the bar. Place the notes of each chord in the right order, four ticks apart with the downward strums beginning on tick 364 and the upward strums beginning a little later, so that the final note of each strum

occurs somewhere between tick 380 and tick 4.

4. The next operation requires patience and persistence. Starting from the beginning of the bar, stretch the length of each note so that it ends a tick or so before the next note of that pitch occurs.

If two notes of the same pitch overlap, one or both of the notes will fail to sound; but if the gap between them is too great, the realism will suffer. This is a job for the list editor (Ctrl+G in Cubase) and a mathematical mind. When you come to the

Tip of the month

How many times do you begin a new MIDI arrangement with a four-on-the-floor kick pattern and then lay down a snare on beats two and four? Why not create a default template with the patterns already in place? And there's no need to stop there: label your tracks (bass, hi-hats) and set up your outputs for the most frequently-used instruments.

Cue for a question

Q I'm sure I'm not the first to gripe about this and will probably not be the last, but it is nevertheless galling. Having put together a shiny new system based on AMD's K6-233 processor, I thought I would treat it to a half-decent sound card rather than the cheap no-name FM cards I have used in the past. So in goes an AWE-64 Value, load the attendant software... oh dear, what's this? Wavesynth/WG apparently requires a minimum of Pentium 90 and 8Mb of RAM and will not install.

Forgive me, but I thought a K6-233 and 32Mb of SDRAM were somewhat more capable than a Pentium 90 with 8Mb RAM? Apparently not. Yes, the small print on the box does state the minimum requirements as "genuine INTEL Pentium 90 or higher", but when buying the sensibly-priced way

(i.e. direct) one doesn't have the luxury of perusing the packaging beforehand.

Perhaps I have been lucky in the past, but in using a multitude of different programs over the years on a variety of Intel and non-Intel based machines, I have never come across anything that refused to run because the label on the processor didn't start with an "I". Is Creative Labs now so dominant that it can afford to risk alienating the growing number of owners of non-Intel PCs? Do you know of a workaround to this problem? Or failing that, can you suggest any cheap alternative software offering similar functionality?

brucep@lapwingcom.demon.co.uk

A You are right to state that you are not the first to come across this problem, but with any luck you may be one of the

last since Creative Labs has finally come up with a fix. The file you require, wswg95up.exe, can be obtained from Creative's home page at www.creaf.com.

There are also a number of so-called soft-synths you may want to check out to provide a further range of instruments. The best site I have come across is www.interlog.com/~willwong/softsynths/. Here you can find Yamaha's excellent S-YXG50 which provides up to 128 voices of editable XG sounds and is available on a 60-day trial basis.

Look out for Audio Compositor on our next issue's cover-mounted CD (sorry, we couldn't include it on this one because of space constraints). This is another popular soft-synth that behaves much like a sampler and supports E-MU's SoundFont file format to provide you with up to six more voices, or 32 when you register with \$40.

Micro Wave It

If you're sick and tired of the dull presets on your AWE-32/64 and want to inject some life into your mixes, you'll probably want to get your hands on this new CD crammed with ready-to-play SoundFonts. Dubbed as the essential SoundBlaster companion, Micro Wave It brings you more than 100 up-to-the-minute sound banks, providing a wide range of fresh synth pads, basses, drum kits and classical instruments.

Where appropriate, banks have been set up to provide a range of dry and effected patches, which are selectable via a simple program change. This is a nice idea, as a heavily-chorused electric piano can sound quite different to the source sample. Given the low cost of this CD, I was surprised to find that many of the patches have been multi-sampled to offer greater realism. Solo instruments, such as woodwind, come across really well because of this. There are six drum kits in the package, including banks for pop, garage, and one that is intriguingly entitled "Great". To ensure the patches will load into 512Kb, percussion samples have been set up into their own banks. Every sample has been provided in sbk, sf2 and wav format, so even if you don't own an AWE card you can still use the sounds with a soft synth, like Audio Compositor.

By the time you read this, an enhanced Wave It CD-ROM will be available which includes 25 drum kits and improved versions of all sounds, enabling greater dynamics and expression for users with 2Mb RAM or more. A new SoundFont editor featuring global editing and automatic pitch recognition will be included.

Watch this space.

■ Price Micro Wave It £19.95

(Wave It Gold £59.95)

Contact Time + Space

0800 614822

Rating ★★★★★



Personal
Computer
World
Recommended

last strum of the bar, think about the chord and voicing of the next bar: if this is going to be another chord of E you will simply copy the same bar, so stretch those final notes accordingly. If there is to be a change of chord, you would commonly silence all strings except the open ones (in this case, silence the G#) for 20-40 ticks at the end of the bar while the guitarist moves his hand.

5. Finally, set the velocities of the notes. This is a matter of experimentation, but yet another rule of thumb dictates that upward strums will be quieter than downward strums and each successive note of a strum will be a little quieter than the last. It can be effective to increase the velocity of the highest note of a downward strum.

6. The final job, using this bar as a template, is to chain bars together to build a complete guitar track, editing the chords and voicings as necessary. The changes of chord will help to disguise the fact that you have chained identical parts, but always try to alter velocities here and there, and add or remove strums and single notes to create a more realistic "live" effect.

PCW Contacts

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Photo finish

A good-looking photomontage is dependent on the choice of suitable images. Ken McMahon's guide to CDs and web-site resources will help you find those perfect pictures.

Montage, as you know, is French for cut out lots of pictures and stick them together to make an exciting new composition from what, looked at individually, was a fairly mediocre bunch of snaps. If only the English language were as elegantly economical.

Photomontage is one of those things which benefits hugely from the digital treatment, being not only very much easier, but also offering a multitude of opportunities for creativity. Despite my earlier comment, to produce a good photomontage you need to have a smattering of interesting images to begin with. In contrast to photography which is used for illustrative purposes, clients often want a montage to convey something less concrete, like a concept or a mood, so it's often a case of finding the right kind of shot as much as the right subject matter.

My approach used to be to scour old books, magazines, cereal packets, videos, wallpaper sample books and friends' holiday snaps for appropriate material. While it can be quite good fun, this approach is often time consuming and not always successful. And thankfully, with the growth of digital royalty-free photolibraries, it is increasingly becoming less necessary.

Treated like royalty

Until recently, paying for commercial photography to add visual "oomph" to your page was an expensive business. Stock photo libraries typically charge from £100 to thousands of pounds for a single picture and you only get to use it once.

The idea behind royalty-free distribution is that you pay once and then use the picture as often as you like within the terms of the licence. Royalty-free pictures



The Photodisc site holds over 50,000 images

are usually sold as CD-ROM collections. The charges typically range from about 25p to £3 per image, making it a more attractive alternative to the arrangement previously mentioned.

Of course, you'll probably use only a few of the 100 or so images on a CD costing between £100 and £200, but this is still excellent value compared to commercial stock photo libraries, or to hiring a professional photographer to get the exact shot you need. In fact, buying a CD collection is usually even cheaper than taking the pictures yourself, once you've added up the cost of film, processing and your own time. Of course, only someone with more money than sense would pay £100 or more for a collection of pictures they hadn't seen.

How do you know that a certain CD will have something you can use? Where do you start to look for a picture of the pyramids at Giza, taken at sunset, with camels in the background and a fez-seller in the foreground? The answer is on the web.

Instant images

These days, most vendors of CD-ROM collections sell their products via the web and some allow you to download individual images. This way, you really can have your cake and eat it. If you do a lot of foody design, say (cookbooks, menus and so on), you can buy entire CDs; but if you want a picture of Mount Everest, rather than spend a hundred quid on a "Mountains of the World" CD, you can pay a smaller fee for the particular picture you want.

Many of the royalty-free picture libraries on the web allow you to download low-resolution images for nothing (you'll probably have to register to do this). You can use these in your visuals and if your client likes them, just download the individual image or order the CD on which it appears.

CD collections

What follows is a small selection of CD-ROM collections and web sites that offer royalty-free images. Next month, we'll use some of it to create a montage in Photoshop.



There are llamas galore at the Corel web site

■ Photodisc

www.photodisc.com

Photodisc has over 50,000 high-resolution images, all available for immediate download from its US web site. It also has one of the best search engines of any of the online photolibraries. Seventeen thousand images are available on CD. Series include animation, backgrounds and fine art. On the US web site each of these 100-image CDs costs \$249.

There's a UK section at www.photodisc.com/uk with special offers like the vol.43 Business Occupations 2 which has 336 images and costs £229 (ex VAT). The drawback with the English bit is that there's no searching and no online ordering: you have to call an 0800 number.

The sheer quantity of images means you can usually find something that matches your search. I tried "Egypt And Nile" and got 25 pictures of Feluccas. "Communication AND Computer AND Network" scored four pictures of the same SCSI cable taken from different angles with different backgrounds! You can get a Starter pack for £29 which has 20 high-res pics and 10,000 low-res images: when you find what you're looking for, you download the high-res version or order the CD.

■ Corel Professional Photos

www.cmml.com

www.corel.com

This web site is just a shopfront for the Corel CD photo collection, among other products distributed by Channel Market Makers.

You cannot search for images or download them individually. However, the CDs are very cheap, which makes them ideal for home or commercial use where budget is the watchword. At £19.95 each,

the CDs contain 100 images in Kodak's Photo CD format.

Photo CD stores images in five resolutions, the highest of which is adequate for quality print reproduction at 10in x 8in. There are over 700 titles which you can buy as bundled Super Ten Packs: these really are exceptional value for money at £39.95, the cost of two individual titles. The Super Ten Pack titles include Aircraft, Animals, Architecture, Business and Industry, Cars, England, Food, Gardens, Sport & Leisure, Textures, Travel and Underwater.

Corel's Photo CD images are not of the same excellent quality as the drum-scanned images used by Photodisc and Digital Vision, but for most purposes they will be good enough.

The Corel web site has a searchable database of more than 71,000 images, also in Photo CD format. These can be purchased individually, although if the picture you want is on one of the CDs it obviously makes sense to buy that. You can download at any of the Photo CD resolutions up to the maximum 3,072 x 2,048 (roughly 10in x 8in at 300dpi) which costs \$24.99 — the lower resolutions are cheaper and the thumbnails are free. To give you an idea of the scope of the Corel library, it has over 100 images of African antelopes, for instance.

■ Adobe Image Club Graphics

www.adobe.com

This is part of Adobe's online shop and sells a range of typefaces as well as Digital Vision's royalty-free CD collection.

Each disc contains 100 drum-scanned images at three resolutions, the highest of which produces a 30Mb file — big enough for 10in x 8in quality print reproduction.

Ken's question corner

Q I found your November column highly illuminating but one question puzzles me: is it possible to bypass the output bureau when preparing photos for printing?

I produce a monthly newsletter, for a local charity, which is printed (offset litho, 750 copies/month) from 600dpi laser copy (i.e. not from film). We would sometimes like to use photos. Is it possible to produce acceptable halftones directly by scanning monochrome and/or colour prints, incorporating them directly into the camera-ready copy?

I realise that print quality would be reduced, relative to film, but we cannot afford to have them professionally

scanned-in each month or individually screened, all ready for pasting up onto the copy.

I suppose what I'm asking is whether I can get away with the same process, resolution and so on, as when printing photos on a laser printer. Your advice would be very welcome.

Graham Lewis

A Yes, it is perfectly possible to print acceptable black-and-white halftones on a 600dpi laser printer. If your layout package allows you to set a halftone screen resolution, experiment with settings between 75 and 90 lpi, which will give you a good compromise between resolution and greyscales. (If it doesn't, don't worry — the printer's default

halftone screen will work fine). Most newspapers use a 66- or 75-line screen.

The limitation is not the resolution of your laser printer but the capability of the process used by your printer. Some printers, particularly those at the cheaper end of the market, use plastic or paper plates which can't "hold" the halftone dots so well: the ink spreads and images become heavy and blotchy. The paper you use will also affect this "spread". Coated art papers will minimise this.

Your printer will be able to give you advice about the best halftone screen resolution to use. He should be able to provide you with some paper samples and, if he's nice, may proof a spread from your next issue (for a small charge).

Titles cost \$249.99 and include Amazing Creatures, Business in Action, Children Now, Globes and Maps, and Industry and Technology. Digital Vision also has a Design Elements Library including Floral Design Elements and — one for all you fork fetishists — Culinary photo objects. There's a starter kit which costs \$12.99 and has 3,000 low-res previews. Like the Corel collection there's no online search option, and you can't purchase images individually.

Alternatively, you can visit Digital Vision's own site at www.discography.com where you can search categories. In Business and Industry, an eight-CD category containing some of the titles mentioned above, searches for "telephone" and "computer" yielded 29 and 84 hits respectively.

The CDs are all priced at £199 and Digital Vision will also give you the starter pack free of charge.

■ **Other sources of royalty-free pics are:** www.cd-enterprises.co.uk — reseller of CD collections.

www.picture-gallery.com — Flat Earth Picture Gallery.

www.handbook.co.uk — UK multimedia handbook, contains directory of London-based stock photo libraries with links. www.icemail.com/shop/item1999.html — seven 100-image CDs for \$16.95 each or \$99 the lot (0800 order line).

www.digital-directory.com/stock.html — directory of stock agencies including royalty-free CD collections.

www.lifestyle.co.uk/ebab.htm — directory of UK photography sites.

Feedback

■ Dave Renton sent me an email about the lack of PC-based output bureaux and the problems he's encountered finding places

which will run files from the less well-known PC layout packages. If anybody out there offers an output service from something other than XPress and PageMaker, please let me know and I will compile a nationwide PC bureau guide. Also, Dave asks: "Are you

Digital Vision's site has an excellent search facility

going to be writing about duotones in a future article? This is a great way to add an extra dimension to a two-colour document but can be costly if you don't get it right. I have recently been working on a newsletter, supplied by a designer, that used two colours throughout, but I had to spend two hours' worth of studio time correcting all the duotone pictures."

The big mistake I once made with duotones was to forget to set the screen angle of the second colour, with the result that the coloured halftone dots printed over the black ones and I got a weak-looking mono halftone. It's true, though, that duotones are an excellent way to add a touch of class to a two-colour document, and I'll work on producing a quick guide for publication in a future issue.

■ Following on from our top ten plug-ins feature a couple of months ago, Andrew Buckle would like to spotlight some of the less well-known plug-in sources like www.netins.net/showcase/wolf359/adobe_pc.htm which contains a bucket-load of Filter Factory-produced plug-ins, including... well I never, a whole load produced by Mr Buckle himself. You'll find lots of other freeware and shareware graphics resources here, too.



PCW Contacts

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Physical jerks

Stretch it, warp it, wobble it or bounce it. Benjamin Woolley explains how to add solid physical characteristics to objects by using HyperMatter, a simple plug-in to 3DStudio MAX.

Physicists like to boast that the laws of nature apply across the entire universe. If we could fly to the furthest galaxy, we would find gravity exercising the same pull as it does on earth.

But such laws do not extend to the virtual universe. In the realm of 3D graphics there is no gravity, no mass, no momentum and no friction. Scenes comprise nothing but geometry, the models that inhabit them being nothing more substantial than surfaces which are knitted together in such a way as to describe a recognisable shape.

That shape may be given the appearance of solidity by being clothed in a texture. It may even be a texture (a "procedural" one) that in some way mimics a physical material. For example, most 3D graphics packages now come with procedural textures for mimicking wood and marble, which reproduce the sort of grain or veins that would be seen in an object sculpted out of those materials.

Zero gravity

But even the most realistically-rendered marble column or wooden table has only the visual features of the object it is supposed to represent: it will have none of the physical qualities. If your column and table stood on a sloping surface, the column would not topple nor the table slide. The force of gravity means nothing.

Usually, if you are rendering still images, you can either simulate or ignore such forces. However, if you are animating objects, the lack of physics can create real difficulties. Even the most simple of behaviours are difficult to reproduce. Objects unexpectedly float, pass through other objects, drift off to infinity and so on.

The scene quickly transforms itself into a maelstrom of mad flying objects.

Furthermore, trying to mimic even the simplest dynamics such as an appropriate bounce for a ball textured to look like it is made of rubber, can verge on the impossible. You not only have to get the bounce right in terms of changes of velocity and trajectory, but you also have to deform the ball as it hits the ground.

Tweaking, squashing and morphing

You can tweak the velocity and the trajectory by editing the path and moving the position of key frames. You can deform the ball by creating two identical versions, squashing one up and then morphing between the two. But with each change you must re-render the animation to see if you are getting closer to the desired result, which makes the process very laborious. And unless you are prepared to create a key for every frame of the animation, the dynamics will inevitably look artificial.

Things are about to change. Physics has entered the 3D graphics world. The leading mid-market packages, Truespace and Ray Dream Studio, now come equipped with tools for adding physical properties to objects. I have also been trying out a plug-in for 3D Studio MAX called HyperMatter, which offers one of the most sophisticated so-called "physics engines" for reproducing physical phenomena.

You can get a form of physics in cheaper software. VRML 2.0, the standard modelling language of the internet, includes facilities for reproducing that most fundamental physical property of solid objects, impenetrability. By using the collision detection parameters, you can at

least prevent objects and avatars from walking through walls and dropping through floors — a common occurrence in VRML 1.0 worlds.

Truespace and Ray Dream Studio offer a lot more than collision detection. They boast the ability to simulate gravity, elasticity, density and, in Truespace's case, "torque" for any selected object in any given scene. I haven't yet managed to spend enough time with either of these packages to be able to assess how well the physics work, but I have spent some time with HyperMatter, an intriguing plug-in for 3D Studio MAX from Second Nature Industries.

Both DOS and Windows versions of 3D Studio have been disappointingly lacking on the physics front, so HyperMatter is a welcome enhancement, if rather expensive at £485 (which you have to pay over and above the cost of 3D Studio MAX). What you get is a set of tools which plug straight into MAX's rather cluttered interface. The basic principle to using HyperMatter is simple: you select an object and press a button which "solidifies" it. This creates a new object, identical in size and shape, but with physical attributes.

Falling over

Physics, as it turns out from using tools like HyperMatter, is not all that simple, as you soon discover when you begin to play with solidified objects. To start with, they do not do what you instruct them to do. But then, this is inevitable, because forces like gravity will have an influence over how the object moves. So when you solidify an object which you are animating, the first thing you find when you come to play the animation is that it falls — and unless you have created

Benjamin's book review — 3D Graphics & Animation

I cut my 3D teeth on a book called *Inside 3D Studio*, and I approached its UK distributor, Prentice Hall, for review copies of some of its other titles. A few phone calls later, what seemed like a skipload of breezeblocks tipped into my office: an extensive library of hefty volumes about various aspects of 2D and 3D graphics. The image alongside resulted from working through the only book not to focus on one particular graphics package: *3D Graphics & Animation* by Mark Giambruno.

It is a useful, intelligent, introduction to general principles, and includes tips (unfortunately, US-orientated but nevertheless useful) on building a portfolio and getting a job. It's expensive at £42, but that includes a CD-ROM and some detailed tutorials. It would be particularly useful to a novice with ambitions to become a pro, especially one who has managed to blag an old copy of 3D Studio.



another object to act as the ground, it keeps on falling. This is because the default "substance" from which a solidified object is made, is one with weight.

The second confusion is that physical forces are features of the object, not the environment. You do not switch gravity "on" and watch everything start to sink.

Unsolidified objects remain as gravity-free as before. They also remain as penetrable, with even solidified objects passing through them as if they were not there.

The reason for allowing you to create a world in which physics is both present and absent is twofold. Firstly, you may want to break the laws of physics once in a while (that, after all, is one of the freedoms computers allow). Secondly, the "physics engine", which has the job of calculating the interactions and dynamics of each solidified object, is a guzzler: it takes up huge quantities of processor cycles. You can easily double the time it takes to create even a preview of your animation, so you need to add only the physics you need.

Mind you, once you start adding physics to a scene, it is hard to stop — this tool is enormous fun. Dead objects come to life as you start to make them wobble, warp, sag,

ripple and flop. HyperMatter includes a library of preset substances (with wonderful names like "Water Bomb") but all the parameters are editable, so you can create just about any substance you can imagine. These parameters include:

- elasticity;
- damping, the degree to which a solid object resists changes to its shape;
- compressibility, the degree to which an object loses volume as it is compressed; and
- friction and density, which determines the object's effect when it hits another: the denser the object, the greater its influence over the collision's outcome.

You can also set constraints on objects, the most important being the collision restraint (for collision detection).

Size matters

There are subtleties involved in adding physics to a scene, which you come to appreciate only when you begin to grapple with the technology. One such subtlety is the importance of size, and what it really means. In the real world, two objects of identical shape but different sizes will behave differently. For instance, while a small ball made of soft rubber will keep its shape, a

large one will tend to sag under its own weight. HyperMatter simulates such differences by allowing you to adjust the degree and speed at which certain forces are applied.

It soon becomes apparent that adding physics does not necessarily add realism to a scene; sometimes it has the opposite effect, allowing you to make teapots of rubber and mice of jelly and see what happens when, using a cannon, you shoot them at a wall. However, even if an animation becomes less realistic, it also becomes less artificial. The dynamics are no longer so rigid and uniform, the shapes so static and flat. For these reasons alone, the introduction of solidity to 3D graphics is welcome, and I hope it will not be long before physics is as ubiquitous in the virtual universe as it is in the physical.

PCW Contacts

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HyperMatter from Second Nature Industries
www.2n.com
 Prentice Hall 01442 881900



Strands of **DNA**

What's in store for the future of programming? Java is of course a hot development topic, and Microsoft, not to be outdone, is busy developing the intriguingly-named Windows DNA.

There is only one hot topic in the development world just now, and it begins with J. All the big questions (how to internet development, distributed objects, which language to use, which operating system to run) are affected by Java and its future.

At the time of writing, two interesting events have occurred. One is Microsoft's PDC (Professional Developer's Conference) held in San Diego, from which I have just returned. The PDC is where Microsoft unveils its software development strategy for the coming year. The other event is that Sun Microsystems initiated legal action against Microsoft for alleged breach of contract in respect of Java's implementation in Internet Explorer 4.0.

This column is not about industry politics, though, but about practical issues facing developers, and Java is just such an issue. You have a software project: should it be implemented in Java, Visual Basic or C++? A decision in favour of Java is particularly fundamental. In effect, you are no longer creating a Windows application but a Java one. Java has become your platform. You will very likely continue to run it on Windows. But consider what difference it makes when you next replace your computer. The priority may be not how well it runs Windows, but how well it runs Java.

Sun owns Java, and Java is developed on Sun computers running Solaris. In other words, the best platform for Java may not be a Windows system at all. It is not

surprising that Microsoft and Sun don't see eye to eye on the subject.

There is an uneasy alliance of software and hardware companies, including Sun, Netscape and Oracle, which is sometimes described as "Anything but Microsoft". The theme of the PDC could equally be called "Anything but Java".

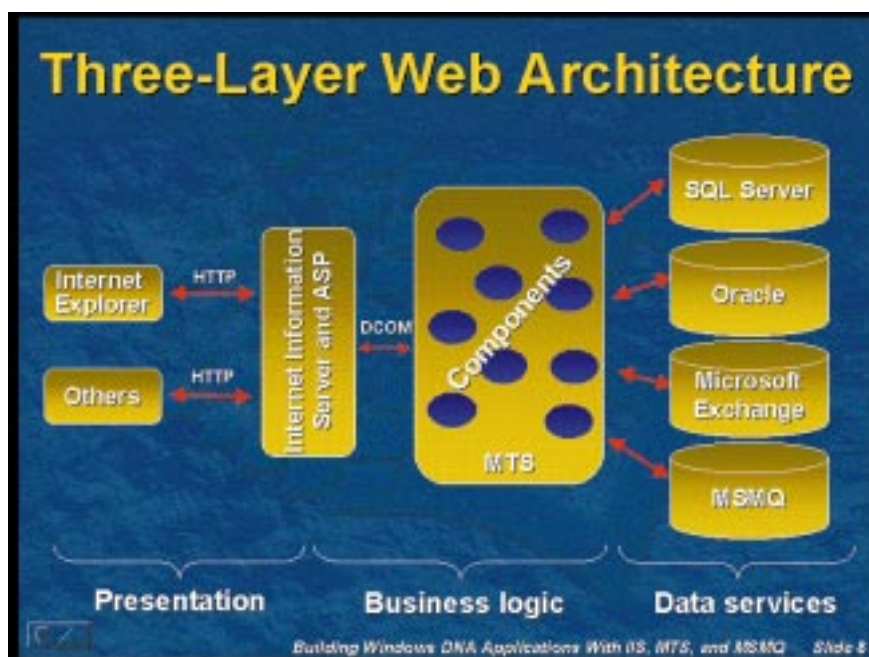
Windows DNA

Microsoft has a Java development tool and a Java virtual machine, but it is a company with nothing to gain and everything to lose from Java's success. The focus of the PDC was a new framework called Windows DNA (Distributed Internet Applications Architecture). It is hard to summarise what Microsoft means by "Windows DNA" but the gist of it is: applications using Internet Explorer, clients with Windows NT and Internet Information Server at the server end. The client application uses HTML beefed up by scripting and the new features of Dynamic HTML.

The real work of the application is handled by application components running on the server or elsewhere on the network. Communication between components, including dynamic database access, is through COM, the ActiveX component model. In this scenario Java still has a place, but as another way to write a client-side control or a server-side component.

Much of the infrastructure for writing Windows DNA applications is already in place. A key part of it is Microsoft Transaction Server, which provides intelligent management of COM objects. Another important element is the Active Directory, coming in Windows NT 5.0, which makes sense of user management.

As an aside: from what we saw at the



Three-tier web applications the Microsoft way involve Internet Explorer and COM components. No sign of the J word

How to get started with Java

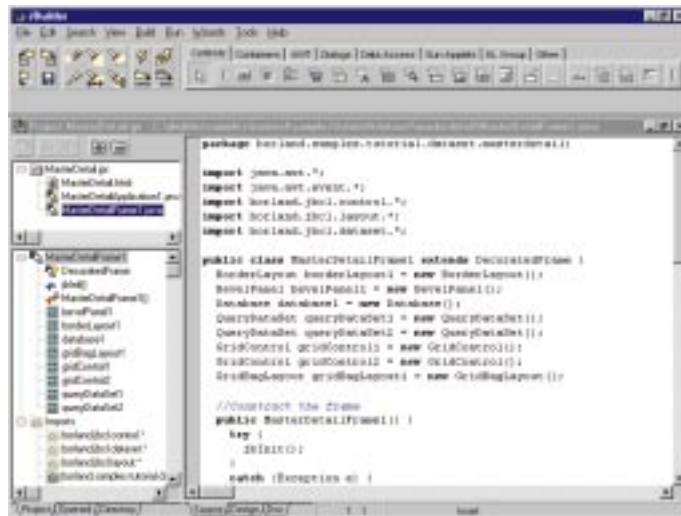
You will love coding with Java. It is clean, object-orientated, productive, powerful and many other things (as fans of Java are keen to point out). Java is not all plain sailing, though. Here are some tips for getting started.

- Visit www.java.sun.com and download the latest Java Development kit (JDK) and the online Java tutorial. Both are free. The advantages of starting with the JDK are that you have the most up-to-date implementation, you achieve a good understanding of Java basics uncluttered by the characteristics of a particular IDE, and the command-line tools are less system-hungry than other Java tools.
- Understand the two kinds of Java project. Applications run standalone (using the Java runtime library) like a Visual Basic program. Applets run in a browser, or in Sun's AppletViewer.

Applications have unrestricted access to files and other system resources, whereas applets are limited, for security reasons, in what they can do. For instance, applets cannot use the JDBC-ODBC bridge to access databases, since ODBC drivers run in native code on the client machine.

- Expect a culture shock if you are a Windows developer. For instance, Java tutorials are full of stuff about layout managers of which a Windows developer has never heard. This is the price you pay for Java's cross-platform approach. Positioning of controls needs to be relative, not absolute.

- There is a new generation of Java development tools which use JavaBean components for fast visual development. Examples are Borland JBuilder, IBM VisualAge Java, PowerSoft PowerJ and Symantec Visual Café 2.0. Despite many excellent features, all these products are system hungry and not always stable. I would recommend Windows NT with 64Mb RAM or more as a minimum.



Left A package like JBuilder is slicker than using command-line tools, but beware instability and system requirements

Below Want to learn Java? This online tutorial is both up-to-date and free to download

- Be clear about why you are using Java. It is outstanding for cross-platform work, for learning object-orientated programming, for distributed applications and for riding what is probably the wave of the future. It is currently poor for those applications where performance is critical, or those which need a rich graphical interface or multimedia capabilities.

- Java deployment can be as easy as putting an applet on a web server. On the other hand,



be warned that browsers vary in how they implement Java. If you want to distribute a Java application, use Sun's Java Runtime Environment (JRE) to set up a Java Virtual Machine along with your application.

PDC, NT 5.0 looks excellent: easier to manage, more scalable, and plugs the gap between NT and Windows 95/98 by including plug-and-play, better games and multimedia support.

Will DNA do it?

Windows DNA is packed with clever ideas, but will it work? Undoubtedly it can be *made* to work, and it does have advantages. One is that performance may be better than a Java-based system, because most processing is carried out by compiled components that either run on the server or are only downloaded once. Another is that migration of existing code may be smoother because all you need to do is expose its interface through COM. Tools like Visual Basic, Visual C++ and Delphi make this easy.

There are several problems, one of which is the complexity of building applications which incorporate so many diverse elements — at a minimum, HTML, scripting, and COM components. Anyone who has worked with moderately complicated web applications will know that using HTML as an application interface is a maintenance nightmare. Also, COM has messy aspects, in particular the need to register client-side components.

The Windows registry is hard to manage. COM components run natively, which is good for performance but makes integration with Mac or Unix systems hard. The solution is to use COM only on the server, putting all the client-side logic into HTML, scripting, or indeed Java. It is not ideal though.

Another factor is that Netscape Navigator and Internet Explorer have many differences. These include how Dynamic HTML is handled and Navigator's lack of support for ActiveX. If users run Navigator, it is difficult to create full-featured Windows DNA applications. Overall, my suspicion is that building good, manageable Windows DNA applications will be possible, but hard.

What about Java?

Some of these considerations, like the need to incorporate HTML and scripting into your application, also apply to Java. But Java still has performance problems.

Where Java shines is for distributed or web applications. The language itself is elegant, productive and likely to result in applications that are easier to maintain than

Anderson answers...

Q I am using Delphi and have designed a database form with several DBEdit fields on it. When the user selects one of these fields I want its background to change colour. The problem arises when I try to create common event handlers for all the DBEdit components on the form. I have tried to change the background colour of the component using either Sender or ActiveControl [as the code in Listing 1 illustrates].

Unfortunately, the only thing these routines succeed in doing is to alter the colour of the form and not the DBEdit.

Kevin Parsons

A This question illustrates several of Delphi's features. Event procedures have a Sender parameter, making available the object which called the event. So why can't you change its Color

Listing 1

```
procedure TForm1.DBEdit1Enter (Sender :TObject);
begin
  with Sender do Color := clRed;
end;
```

Listing 2

```
procedure TForm1.DBEdit1Enter(Sender: TObject);
var
  thisEdit: TDBEdit;
begin
  if sender is TDBEdit then
  begin
    thisEdit := TDBEdit(Sender);
    thisEdit.Color := clRed;
  end;
end;
```

Listing 3

```
Declare Function PlaySound Lib "winmm.dll" Alias "PlaySoundA" (ByVal lpszName As >
String, ByVal hModule As Long, ByVal dwFlags As Long) As Long
```

[Key: > listing continued on next line]

Listing 4

```
Dim lRetVal As Long
lRetVal = PlaySound("C:\WINDOWS\MEDIA\CHIMES.WAV", 0, 0)
```

property? The answer is that Sender has a type of TObject, which doesn't have a Color property. Neither does ActiveControl, which is of type TWinControl. In this example, the event procedure is a method of TForm1, so Delphi correctly changes the Color property of TForm1 instead.

The solution is to use a typecast. This tells Delphi that Sender is actually a TEdit control, which does have a Color

property. The amended code is like that shown in Listing 2. The line "if sender is TDBEdit" is not essential in this case, because you can ensure that the event is only attached to DBEdit controls. It is useful if you have code which you want to attach to more than one type of object.

Q I am still learning Visual Basic and use the v5.0 learning edition. I am trying to write

a program that will make heavy use of playing WAV files, but when I use the OLE function the WAV file plays, although there is an error message in hex format.

Could you please tell me how to play a WAV or MIDI file when an event happens? I can only play one, by double-clicking on the icon.

Nathan W.

A The easiest way to play WAV files in VB is by using the Multimedia control. Set the filename to point to the WAV file, and set the command property to Play in your code. I suspect from your question that the Multimedia control is not supplied with the Learning Edition. In that case, you can use the OLE control.

First, link or embed the WAV file and then play it using the DoVerb method. Playing is the default action of a sound, so you can use

```
OLE1.DoVerb (vbOLEPrimary)
```

You may feel all this is over-the-top just to play a sound file, and I would not quibble with that. The solution yet again is an API function. This is the declare shown in Listing 3, so now you can write code like that shown in Listing 4. This also has the advantage that no applet window opens, the sound just plays. You should look up the function in an API help file to explore the parameter options available.

scripts, Dynamic HTML or even Visual Basic. You can use Java on the client, on the server and across diverse platforms. Remote Method Invocation (RMI) makes it possible for Java objects to communicate across the network. Microsoft's competitors love Java because they are no longer forced to support Windows. Like Windows, Java is a proprietary technology owned by a single

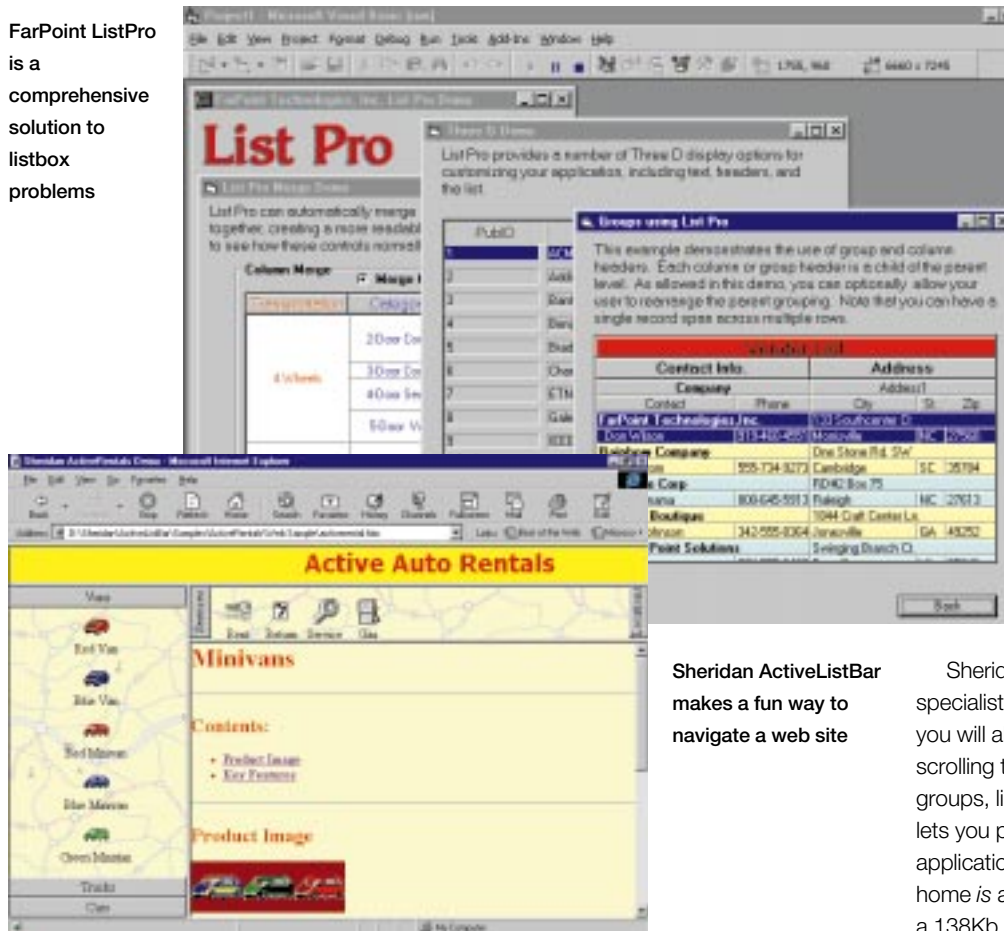
company (in this case, Sun) so it is possible that at some later date this ownership may, too, be resented. But at present, Sun's open approach to managing Java is winning industry-wide support, which gives developers confidence that investment in Java will not be wasted. Time to learn Java, then: see "How to get started with Java", page 313, for some tips and problems.

Get listed

Java is exciting stuff, but for many, Windows is where the real work gets done. Two recently released ActiveX components will help. FarPoint's List Pro is a model of how an add-on should be done. It is an update of an earlier product, called Aware/VBX, and comes in four forms, all in one box: 16- and 32-bit DLLs, VBX and ActiveX.

p316 >

FarPoint ListPro is a comprehensive solution to listbox problems



Sheridan ActiveListBar makes a fun way to navigate a web site

I can recommend List Pro. There is a list control and a combo box, with many advantages over the standard Visual Basic or Delphi equivalents. Both claim to handle up to two billion list items. Another key feature is the ability to merge cells in the list, to avoid the continuance of repeating values. There are hundreds of properties, enabling you to customise the appearance of the list. You can organise items into groups. You can also set font and colour properties for individual cells and include both text and graphics. Also in the box is a detailed printed manual.

Sheridan's ActiveListBar is more specialist than List Pro. If you have Office 97 you will already know the Outlook Bar (a scrolling toolbar which is also divided into groups, like a tabbed dialog). ActiveListBar lets you put one of these in your own application or web site. In fact, its natural home is a web page and Sheridan supplies a 138Kb signed CAB file for easy deployment, the main snag being that users need 32-bit Windows and Internet Explorer, or an ActiveX plug-in.

You can have sound and 3D effects as the user selects icons. It makes a nice navigation tool, but I'm less happy about Sheridan's presentation. The box is smart, but there is nothing inside except a few leaflets and a CD. Apparently, Sheridan no longer produces printed documentation for its products. Another gripe is that many of the example files do not work unless you have Active ThreeD (another Sheridan product) installed. But it is worth considering if you like the effect of the Outlook Bar.

Books in brief

■ *Java 1.1 Unleashed* by Michael Morrison and others

Continuing the Java theme, here is a 1,300-page handbook which explains all, from the basics to remote objects and the CORBA industry standard for distributed objects. Thirty-one contributing authors are listed. This is a good way to get an up-to-date book published quickly, with chapters written by specialists, but the downside is uneven style and repetition. For instance: the chapter on Remote Method Invocation overlaps with a one by a different author, about remote objects; and layout managers are introduced twice, in chapters on Applets and AWT. By way of compensation, there is detailed explanation with examples on most Java topics. The book is a fine reference tool but too disjointed to give the overall picture of how to design and build a Java application.

■ *Delphi 3 Client/Server Developer's Guide* by Ken Henderson

I suspect there are too many books attempting to give comprehensive coverage of complex developer tools and too few which focus on a particular area. That means many shallow and repetitive titles. This one, by contrast, is focused on client/server database development with Delphi. It is a topical subject now that PCs capable of running server databases are commonplace.

The book is in four sections. The first provides an overview of both Delphi and client/server database design. Next is a detailed tutorial covering entity modelling, form design and reporting. The third section has chapters specific to popular databases, Microsoft and Sybase SQL Server, Oracle and Interbase. Finally, the fourth part tackles advanced topics including multi-tier applications, advanced SQL and ActiveX internet applications. An appendix has useful tips for migrants from Visual Basic and Delphi. This is a useful, common-sense book suitable for Delphi developers with no previous knowledge of client/server issues.

• See PCW Contacts box for prices and availability.

PCW Contacts

Tim Anderson welcomes your Visual Programming tips and queries. He can be contacted at the usual PCW address (p12) or at visual@pcw.vnu.co.uk

Computer Manuals 0121 706 6000 for books reviewed here: *Java 1.1 Unleashed* (£54.95 book and CD); *Delphi 3 Client/Server Developer's Guide* (£54.95 book and CD).

Contemporary Software 01344 873434 for FarPoint ListPro (£175 ex VAT) and Sheridan ActiveListBar (£99 ex VAT).

Java information or to download the JDK visit www.java.sun.com or www.javasoft.com



Following protocol

Bob Walder unravels the complexities of TCP/IP to help you create your own network or get connected to the internet. He covers the basics, routing, and configuring Windows 95.

TCP/IP is the protocol which underlies the entire internet and is likely to become the standard protocol in all corporate networks (whether or not they could be classed as intranets) as well as our SME (Small to Medium Enterprise) networks.

TCP/IP has the reputation of being something of a “black art”, particularly in relation to subnetting, and although it is daunting at first sight, with a little perseverance you will soon be at ease with all things IP-related.

There is a lot of material to get through here, but I have resisted the urge to cover this topic in two episodes. There is nothing more annoying than having to wait for the second half of something before you can begin a project: rather like opening your brand-new toy on Christmas morning to find that the batteries are not included!

There is plenty of background information which I would like to include here but space simply does not permit. Instead, I will concentrate on the stuff you really need to know in order to create your own TCP/IP network or connect your PC to the internet. If you want to know a bit more about the whys and wherefores behind what I am about to tell you, the best thing would be to purchase one of the many books on the subject, one of which I have reviewed here.

The basics

Starting at the beginning, then, every PC which is attached to a TCP/IP network requires a unique four-byte number which is usually written as four decimal numbers separated by dots. Thus, the smallest IP address is 0.0.0.0 while the largest is 255.255.255.255 and it can be allocated in

Bob's book review

Title TCP/IP (Running a Successful Network)
Authors K Washburn and JT Evans
Publisher Addison-Wesley
Price £29.95

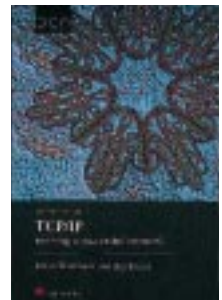
In keeping with the subject matter of this month's column, I have taken a quick look at a book which should help to provide a much deeper understanding of TCP/IP and all its inner mysteries than I could ever hope to do in a few pages, here. The book is divided into three parts. Part 1 is about “what and how”, and provides a useful grounding in TCP/IP without going into masses of technical detail about the guts and innards. It covers TCP/IP basics, bridging and routing, managing addresses, subnetting, system configuration and performance optimisation.

Part 2 is for the “bits and bytes” brigade, delving into the murky depths of the protocol to describe the detailed technical standards behind TCP/IP systems. It allows the technically biased reader to determine the underlying limits of TCP/IP systems and take action to ensure that systems, particularly large ones, remain stable. It is concerned with tuning performance, achieving reliability, stability and cost-effectiveness through a detailed understanding of the foundations laid in Part 1.

Part 3 is a collection of reference material and tables extracted from TCP/IP and LAN standards which can simplify the configuration and management of TCP/IP systems. Parts 1 and 2 can be read in isolation, or in either order according to interest and immediate need. Part 1 can also stand alone as a planning and implementation guide, while Part 3 can be used as general reference material.

The writing style is a little dry, perhaps, but Washburn and Evans' *TCP/IP* offers something for everyone. It is an ideal introduction to the protocol and its use in today's networks, in addition to offering a more detailed reference tome for those who require it.

■ *My thanks to Computer Manuals (0121 706 6000) for keeping me supplied with review copies.*



one of two ways. The simplest and most common method for single-user internet access is to have your ISP allocate it dynamically each time you attach to the network. In this scenario, your machine does not have a permanent IP address associated with it but one is allocated temporarily each time you connect to the network.

If, however, you want to do something a little more ambitious — say, attach a small network of a dozen PCs to the internet — then you will require a range of permanent IP addresses: one for each PC and one for the router or gateway which routes your

network traffic to the internet. It is this scenario on which I want to concentrate, given that this is a Networking (implying multiple nodes) rather than a Windows 95 Hands On column.

The not-so-basics

Each IP address is actually made up of two parts: a network portion and a host portion. A network in this context can be anything from an entire corporate LAN down to a single piece of wire with just one or two PCs on it. The host portion identifies each of the nodes on the network individually. But when

Example 1: Logical AND operation

IP address	11000010.11000000.00101100.00010001	(194.192.44.17)
AND subnet mask	11111111.11111111.11111111.11110000	(255.255.255.240)
= network address	11000010.11000000.00101100.00010000	(194.192.44.16)

you see an address like 194.192.44.17, how do you know which is the network portion and which is the host?

The trick is to examine the subnet mask, which will look something like

255.255.255.0

If you convert these figures to binary, the subnet mask indicates which part of the IP address is the network portion.

The example I have just used is fairly straightforward, since it translates into **11111111.11111111.11111111.00000000** which indicates that the first three bytes are used to identify the network and the remaining byte is used to identify the nodes.

A quirk of the rules means we cannot use all noughts or all ones in the host or subnet address (the first indicates "the entire network" and the second is the "broadcast" address), which leaves us the numbers 1 to 254 to represent our hosts. This is known as a Class C address, where the first three bytes are fixed.

It takes a small leap of the imagination to conclude that a Class B address has the first two bytes fixed to represent the network and can have up to 65,534 hosts, while the

incredibly rare Class A address has only the first byte fixed (hence there can only be 254 Class A networks in total) with the final three bytes providing us with 16,777,214 hosts.

Even a Class C network is beyond the requirements (and the means) of most of us, so ISPs will divide each Class C network allocated to it into a number of smaller subnets by further use of the subnet mask.

For instance, if you have a network of between seven and 14 PCs, a subnet mask of 255.255.255.240 will be allocated to you. To understand how this works, we need to convert our IP address and subnet mask into binary and, reaching back into our distant past and the terrors of binary arithmetic at school, we need to perform a logical AND operation on the two to provide us with our network address (Example 1).

For those of you requiring a quick refresher course, a logical AND means that wherever there is a 1 in both the IP address

AND the subnet mask, then there will be a 1 in the corresponding position in the network address, otherwise it will be a zero.

Converting the resulting network address back to decimal gives us 194.192.44.16 which effectively means a Class C address of 194.192.44.0 and a subnet address of 16. Allowing for the rule that we cannot use all noughts or all ones in our network addresses, the above subnet mask thus provides us with 14 possible networks each with 14 nodes (see box, p324). Our example node which has a final byte of 17, therefore, is actually node 1 in network number 1 using the above mask.

Let's look at one more example: 194.192.44.55 (Example 2). Concentrating on that final byte of the IP address again, we can see that the left half (which corresponds to the four ones in the subnet mask) is 0011, which gives us a subnet number of 3, indicating the third subnet in the range available using the mask of 240 (again, see box, p324). The right half is 0111, which means it is the seventh node in that particular subnet. Given that the

Example 2: 194.192.44.55

IP address	11000010.11000000.00101100.00110111	(194.192.44.55)
AND subnet mask	11111111.11111111.11111111.11110000	(255.255.255.240)
= network address	11000010.11000000.00101100.00110000	(194.192.44.48)

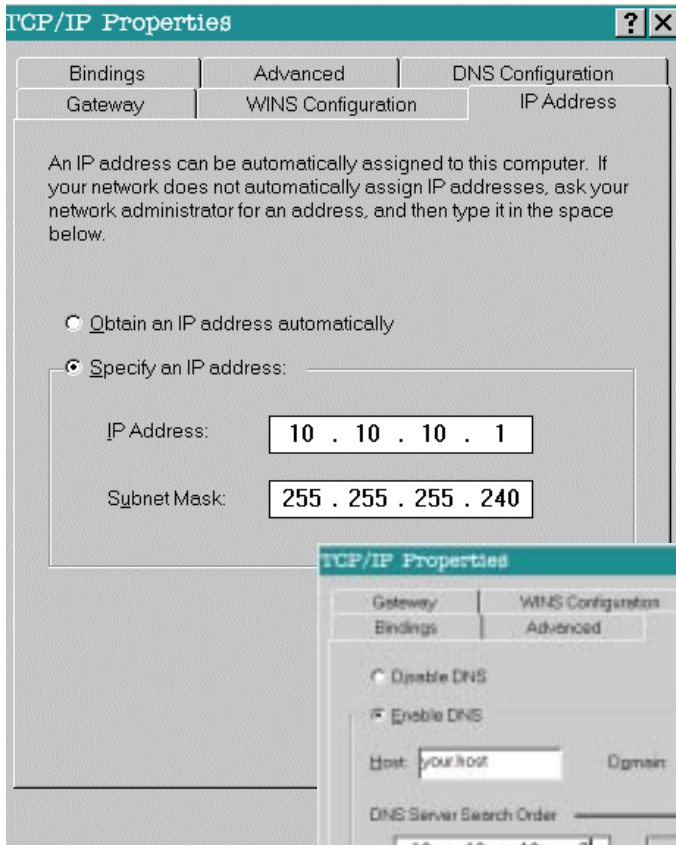
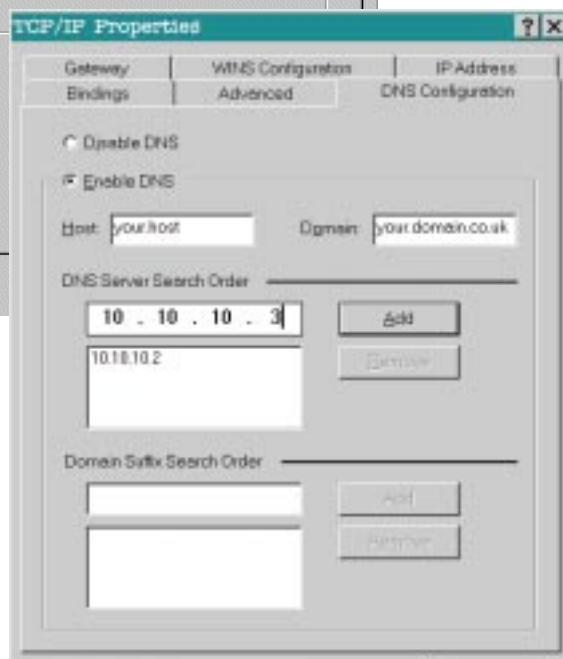


Fig 1 (left)
Specifying your IP
address and
subnet mask in
Windows 95
Control Panel

Fig 2 (below)
Configuring DNS
parameters



network address ends in a 48, it falls into place that the seventh node of that particular network will be 55 ($48 + 7$), which is our IP address.

Routing

Phew! It may take some time to get your head around the above, but it is worth re-reading a few times and working through a few examples of your own in order to get it down pat. But why is it so important to figure out which is the network and which is the host portion? Routing is the answer.

Routing is the means by which packets travel around the internet from one machine to another, and it is a router that we use to attach our network to the internet (this becomes the "default gateway"). The router will have at least two interfaces: the LAN interface (a network card) to attach it to the local network, and a WAN interface (a serial port or ISDN connection) to connect it to the internet. Each of these must be on a different subnet in order for the router to function correctly: the LAN interface will be on the same subnet as all your other networked PCs, while the communications interface will be on a subnet which has been allocated by your ISP.

When any IP device gets ready to send out a packet of information, it looks at the destination address. Using the subnet mask, it then determines whether or not the destination node is on the same network as itself. If it is on the same network, the machine simply uses the appropriate link-level protocol to send the packet directly to the destination machine. If it is on a different network, however, the packet is sent to the default gateway.

Since the router holds an internal table of what networks are connected to which LAN or WAN interface, all it has to do in order to speed things in the right direction is to logical-AND the destination host address or each packet with the subnet mask (giving the destination network address) and then look up the result in the routing table before passing the packet out of the right interface. Once the packet has been transferred from

Establishing BaseCamp

Microsoft is testing a new product designed to expand the networking services of Windows NT. The product, codenamed BaseCamp, is a client-server platform designed to allow secure network connections through un-trusted networks such as the internet.

BaseCamp uses a client Connection Manager and a server-based Internet Authentication Server. This combination allows companies to build virtual private networks (VPNs) where all data is transmitted in an encrypted form over the internet. The software, in limited beta-testing at the time of writing and hopefully available by the end of 1997, will support the Point-to-Point Tunneling Protocol (PPTP) as well as RADIUS, and CHAP authentication mechanisms.

Possible subnets using a mask of 240

In the examples in the main body of the column I used a subnet mask of 255.255.255.240 and explained how it provided 14 networks of 14 nodes. To help you work through a few examples of your own, the appropriate address ranges are:

Network 1	17 – 30
Network 2	33 – 46
Network 3	49 – 62
Network 4	65 – 78
Network 5	81 – 94
Network 6	97 – 110
Network 7	113 – 126
Network 8	129 – 142
Network 9	145 – 158
Network 10	161 – 174
Network 11	177 – 190
Network 12	193 – 206
Network 13	209 – 222
Network 14	225 – 238

the local interface to the WAN interface, it travels to the router at your ISP and onwards across the internet.

It is important that you do not try to make up your own set of IP addresses and hope to attach your network to the internet; it won't work. Addresses are allocated in large chunks to ISPs by a central authority and the ISPs dish them out in smaller chunks, as required. This is the only way to ensure that all addresses on the internet are unique.

If, however, you want to use IP in-house and have no interest in connecting to the internet, there are several "safe" ranges of

non-routable addresses with which you can work. These are:

- Class A network

10.0.0.0 to 10.255.255.255

- 16 Class B networks

172.16.0.0 to 172.31.255.255

- Class B network

192.168.0.0 to 192.168.255.255

Configuring Windows 95

Although the general principle described above applies to all routers, configuring them to perform even the most basic routing functions can be quite daunting.

User interfaces and documentation often leave a lot to be desired, so a detailed description of router configuration is beyond the scope of this article. But configuring Windows 95 could not be simpler. Once you have your router installed and your network addresses allocated by your ISP, you should go to each client in turn and install the TCP/IP protocol (if that has not already been done).

In the Control Panel, click on Network, Add, Protocol, Microsoft, TCP/IP and you will eventually be presented with the configuration window which looks something like Fig 1.

There is actually not that much to configure, so you can start by entering the IP address of this machine and the subnet mask, both of which you will get from your ISP. The other information which your ISP should supply is the name of your domain and DNS server, and these should be entered in the DNS tab, as shown in Fig 2. The host name can be anything and most ISPs will not specify these for you.

Finally, in the Gateway tab, enter the IP address of the LAN interface of your default gateway, or router. When applying these changes ignore any warning messages you may get about WINS servers, and reboot your machine for the changes to take effect.

Once this operation has been performed on all clients (ensuring that a unique IP address is used on each one) your TCP/IP network should be up and running.

■ *In a future column, I will take you through setting up a DHCP or WINS server to simplify the management of IP addresses on your network.*

PCW Contact

Bob Walder can be contacted via the PCW office (see page 12) or email networks@pcw.vnu.co.uk

Screen gems

When your refresh rates have been refined and your brightness levels are at their best, and your monitor is still not looking good, it might be time to buy. Lynley Oram offers some advice.

Christmas is almost upon us, and if you're not going to treat yourself to a new PC, you may want to treat your eyes to a new monitor. While quite expensive, a good monitor will long outlive your PC and give years of satisfaction.

Before you dig deep into your pockets, make sure you really need to. Last month we looked at some of the ways you can make sure you're operating a healthy monitor. But if you've adjusted your refresh rates and altered your brightness levels, and are still not happy, then it may be time to go shopping.

When you are purchasing a new system, it's worth bearing in mind that the monitor outlives the PC. If the monitor is the single most expensive component of your computer, spinning its life out over the span of two or even three PCs may save you money in the long term.

But where should you start, and what should you look for? If I could choose any type of monitor at all, I would without a doubt go for a flat-panel monitor. These use the same LCD technology you'll find in notebooks and take up only the barest amount of deskspace. Unfortunately, flat-panel monitors tend to cost three or four times as much as their large, bulky CRT cousins, so remain out of reach for all but the wealthiest users.

You will need to decide what size monitor you want. A Cathode Ray Tube (CRT) monitor (Fig 1) is like a huge glass bottle with electron guns in its neck which fire at the screen.

What a difference an inch makes

CRT monitors are usually categorised according to the size of the glass tube. As a rule of thumb, the actual image size on a CRT monitor is usually about an inch smaller than the quoted size, so a 17in monitor usually has a viewable area of 16in. This can vary hugely from manufacturer to manufacturer, so do ask, or take a tape measure with you.

If your PC is used mainly for word processing and other general applications, the most suitable size will be between 15in

Fig 1 A CRT tube is like a glass bottle with electron guns in its neck which fire at the screen in the bottom. The screen is covered with a matrix of dots, each consisting of three blobs of coloured phosphor: one red, one green, one blue

and 17in. There are 14in monitors, and these are commonly shipped with PCs at the budget end of the market, but we don't recommend buying one.

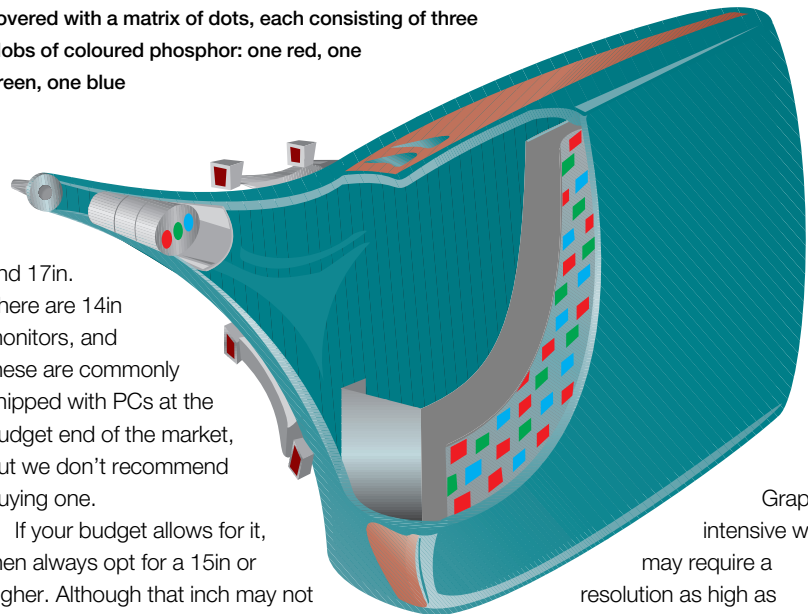
If your budget allows for it, then always opt for a 15in or higher. Although that inch may not sound like a lot, it does make a difference in terms of picture quality. Some manufacturers tend to use 14in and 15in respectively as code for poor or good-quality monitors.

Having said that, not all 14in monitors are bad, and it is possible to find models that will outperform their bigger siblings. This will require a lot of shopping around, though. For graphics-intensive work such as DTP and CAD, don't consider anything less than a 17in monitor, or go even further and invest in a 19in or 21in model.

Resolutions

Monitor resolutions vary from 640 x 480 to 1280 x 1024 and more. These figures refer to the number of pixels shown on the screen. If you can, try running the software you will be using the most often to see what it looks like. The higher the resolution, the finer the detail that can be reproduced on-screen. But as this makes the images smaller, high resolutions are best viewed on physically larger monitors.

Anyone who spends a lot of time running word processors and large spreadsheets, with lots of windows open, should go for a 17in monitor capable of handling a resolution of up to 1280 x 1024.



Graphics-intensive work may require a resolution as high as 1920 x 1200.

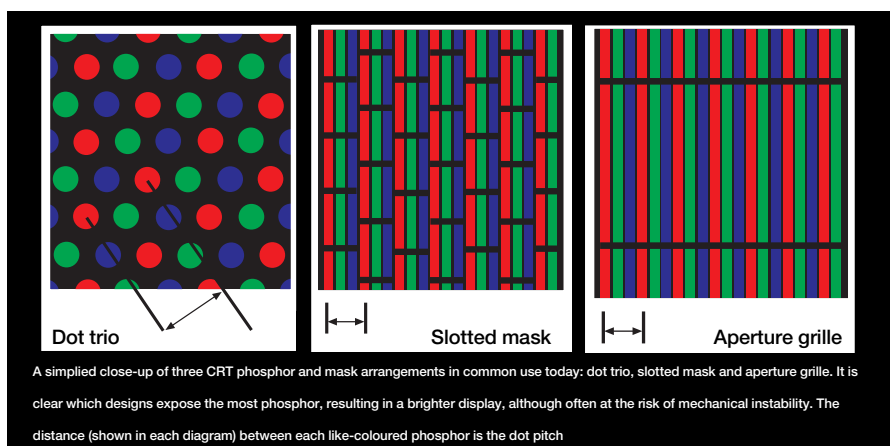
Bear in mind that you will need a graphics card in your PC that is capable of supporting high resolutions at non-interlaced refresh rates higher than 72Hz. It won't matter how high a resolution your monitor can cope with, if it doesn't get the necessary support from the graphics card. However, it's usually the graphics card that outperforms the monitor by far.

CRT technology

Decide what CRT technology will most suit you. All visible colours can be made from mixing the three primary colours of red, blue and green (RGB). Electron guns are busy firing a stream of electrons at the front of your CRT. The electrons impact with the red, green and blue coatings of phosphor which cover the screen, causing them to emit coloured light.

The image you see on your screen is made up of thousands of pixels (the word is derived from "picture element"). Each pixel is made up of blobs of red, green and blue phosphor grouped so closely together that the human eye perceives the combination as a single-coloured computer pixel.

Any overspill of the electron beam could illuminate more than one dot, which would



result in a very fuzzy and multicoloured picture. To stop this from happening, a metal mask separates each dot and, needless to say, light cannot penetrate the mask. This mask also gives the screen a certain amount of stability.

Blobs, masks and triads

There are three ways of arranging these phosphor blobs, each with a different type of mask. The vast majority of computer monitors use circular blobs of phosphor and arrange them in triangular formation. These groups are known as triads, and the arrangement is known as a dot-trio design using a shadow mask (Fig 2, above). An arrangement like this means that the mask takes up a fair portion of the screen area.

There are alternatives to the dot trio design, however. In the sixties, Sony developed a tube technology known as Trinitron, where the coloured phosphors are laid down in uninterrupted vertical stripes. The mask separates entire stripes instead of each dot, and is known as an aperture grille. Since less of the screen area is occupied by the mask, more of the phosphor can glow, resulting in a brighter, more vibrant display.

For design-intensive work, such as that undertaken by people using the Mac, this type of screen is the most suitable. Designers may want to consider investing in a monitor with more technical controls: a colour temperature control would be handy, for instance. For true colour matching, they would be able to make adjustments to the monitor's colour temperature throughout the day.

When Sony's copyright expired, Mitsubishi developed its own aperture grille technology, called Diamondtron. Although the mask used is very similar to Sony's, Mitsubishi uses three electron guns instead of Sony's one.

Monitors based on this type of technology usually cost a bit more than those based on dot-trio designs. And because there's less mask, the screen is less stable. To counter this, Trinitron-type monitors have either one or two very fine wires running horizontally across the display. These wires are only just visible to the naked eye, and you'd have to look pretty hard to find them. Even so, this still bothers some people.

There is a third option, however. NEC has taken slotted mask technology, widely used in TV manufacture, and developed it for higher-resolution computer displays. Called ChromaClear, this design falls in-between aperture grille and dot-trio shadow masks in terms of brightness and mechanical stability.

Browsing is best

Time permitting, do a lot of browsing before buying. Visit a showroom and try out as many different types of monitors as possible. Do this even if you are going to buy your monitor by mail order. If the monitor you want isn't available retail, have a look around anyway so you've got something to compare it to. When buying, always make sure you can return it and get your money back, if you don't like it.

This isn't because monitors vary widely in quality. They used to, but today, many of the main brands are becoming indistinguishable. The difference lies in your individuality. No one person will see exactly what another person is seeing, and monitor buying is a very subjective experience.

As I suggested in last month's column, you may want to look for monitors with on-screen controls, anti-glare technology such as Anti-Reflective Coating, and low-emission standards such as MPR II, TCO92 or TCO95.

If you don't fancy trudging round the

shops, then check out our monitor reviews. PCW ran a 17in monitor group test in its May issue, and there are monitor reviews appearing regularly in "First Impressions". And if that's not enough, all the monitors received for our PC group tests are evaluated separately.

Some monitors may offer a choice of connections, such as for speakers. There are advantages and disadvantages to plugging your speakers into and onto your monitor. A lot of sound cards and speakers support 3D effects, and these are most effective when directed as accurately as possible at the listener. However, bear in mind that monitors are susceptible to magnetism, and badly shielded speakers will interfere with the image on your screen. This applies to all electronic devices, so if your picture is distorting, try moving your speakers, printer or telephone a little further away, to see if the image improves.

By the nature of their design, aperture grille monitors are susceptible to vibrations, so if you're into bass, move the subwoofer and speakers onto a separate surface. Microphone and camera connections (these can be housed in the monitor) can come in handy for video-conferencing or for chatting to long-distance relatives on the other side of the world.

Danger USB!

The monitor has been seen as a natural place for a USB hub, as it is closer to the user. USB is a great new interface for PCs that will allow you to connect up to 127 peripherals to your PC, and to plug and unplug those peripherals without switching your PC off. This sounds great, but few manufacturers have developed USB products so the take-up has been slow. A number of USB devices are due to be launched, however, such as keyboards, mice and digital cameras.

Whether or not the USB revolution happens is debatable, but some monitors are being manufactured with USB connections in the rear, which will allow a user to upgrade to USB at a later date should they want to.

PCW Contact

Lynley Oram welcomes feedback and suggestions from readers. Email beginners@pcw.co.uk

The Computer Suppliers Federation offers good advice on buying monitors. Tel 01905 613 236; www.csf.org.uk

PCW Reader Offers



CD-ROM Holder

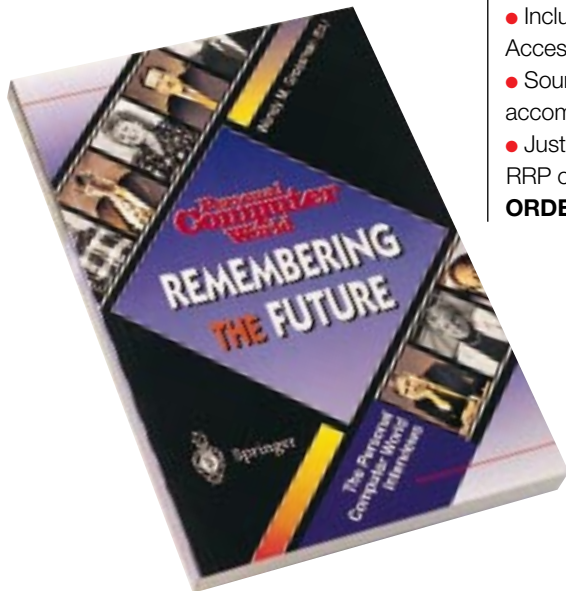
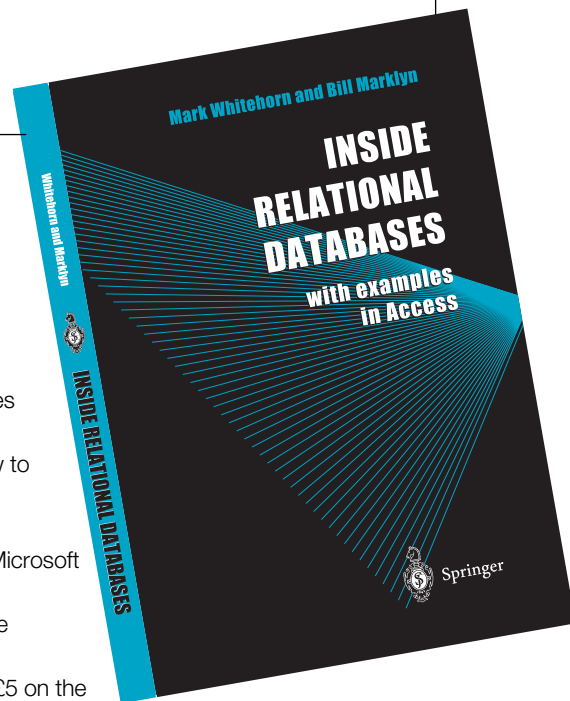
- Black softgrain leather with 12 CD sleeves.
 - Embossed in gold block with the *Personal Computer World* logo. (CDs not supplied.)
 - Price £6.95 (inc P&P).
- ORDER REF. PCW02**

Inside Relational Databases

(reviewed in *PCW* November, p329)

- Written by Mark Whitehorn, who writes *PCW*'s Hands On Databases column.
- Explains everything you need to know to create efficient relational databases.
- Avoids the usual database jargon.
- Includes masses of examples using Microsoft Access.
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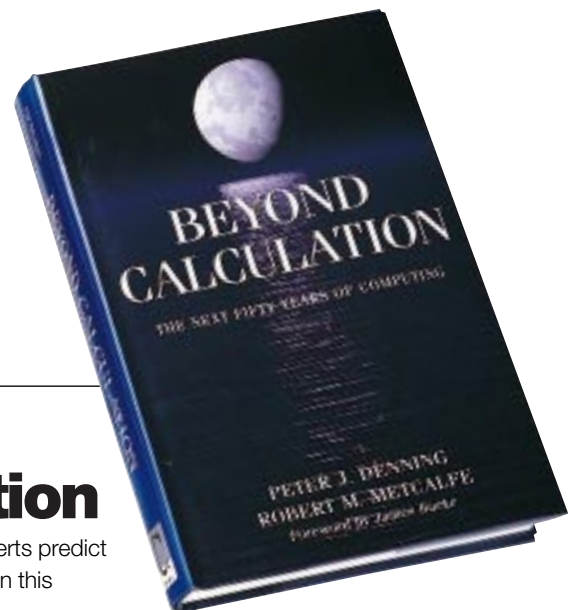
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Beyond Calculation

- World-recognised experts predict the future of computing in this ground-breaking book.
- £9.95 (inc P&P) — over 30 percent off the RRP of £14.95.

ORDER REF. PCW05

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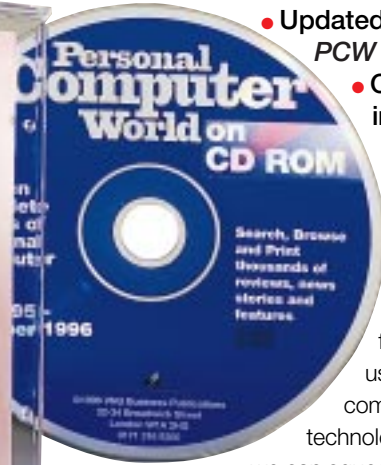
includes
DEC '97

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- CD No. 5 includes 24 months of PCW up to and including the December 97 issue.
- Each CD costs just £9.95 (including P&P. Please allow 28 days for delivery).
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we can squeeze nearly 5,000 editorial pages onto a single CD-ROM. All articles appear on-

screen exactly as they originally appeared in the magazine. You can print out articles, browse through past issues, or search by subject or keyword in seconds. In Browse mode you can choose which year you want to search through. Look through the contents page of the issue you want to browse and click on any article to go straight to that page. In Search mode, you just enter the words you want to search for.

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Brainteasers

Quickie

George and Albert can decorate a room in 12 hours between them, even though Albert only works at 75 percent of George's speed. How long would it take each man individually to decorate the same room?

Winner of the October 1997 Prize Puzzle

I think the prime sequencing problem proved a little too much for many of your PCs. It wasn't really that difficult, but it did require a hefty bit of number crunching to ensure the correct answer, although at least one entrant came up with the answer using logic and an educated guess.

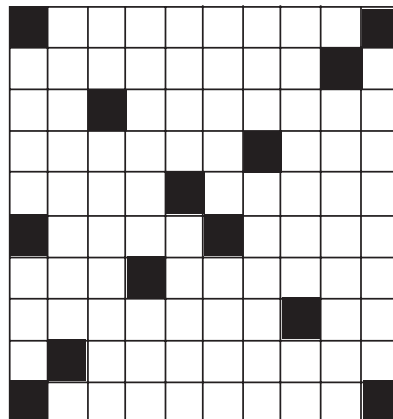
The correct result, which almost all of the 60 or so entrants managed to get, is **1379245680**.

The winning card, selected from the pile, came from Mr RW Ford of Yateley in Hampshire, who we congratulate and who

will receive his prize shortly. Meanwhile, to all the others — keep trying, you could be the next winner.

Prize Puzzle

The usual Christmas number crossword for this month. Arrange the numbers on the right into the grid — some across and



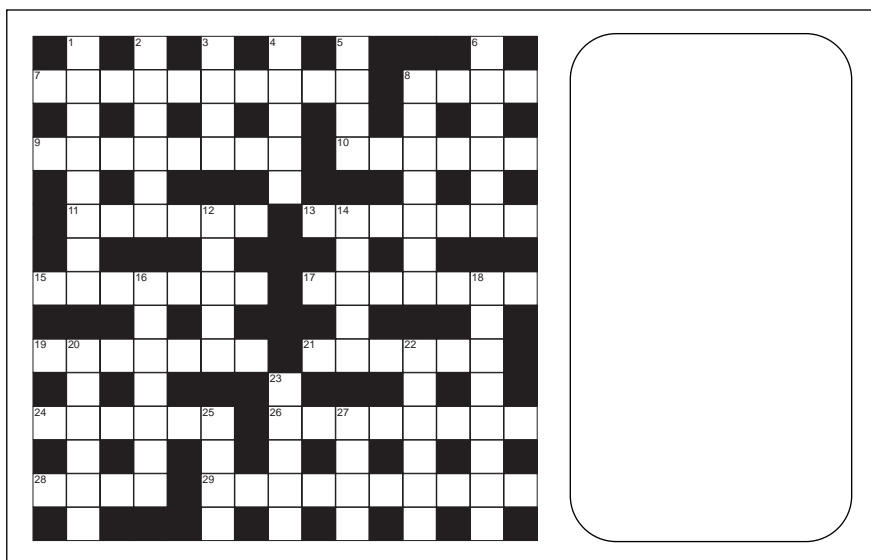
some down — in the manner of a crossword. When you've done it, cut out (or photocopy) the completed grid and stick it on the back of a sealed envelope or onto a postcard.

44	6479	3808091
62	6949	4372055
63	9022	7004611
84	9631	8287015
237	53656	11542654
252	58875	50648652
416	93065	65450870
677	341188	85486358
802	361124	88995671
3779	784627	95259834
4148	958617	95668422

Send to PCW Prize Puzzle — January 1998, P. O. Box 99, Harrogate, N Yorks HG2 0XJ, to arrive not later than 20th January 1998. *Please do not send solutions on floppy disks or in envelopes.*

JJ Clessa

Crossword



- 32 and 34 Sound card's real sound capability (9)
- 33 Place for expansion (4)
- 34 See 32 across

DOWN

- 1 Silent show (4)
- 2 Hold back (8)
- 3 Retribution (7)
- 4 Incline (5)
- 5 Outcry (6)
- 6 Genuine (4)
- 10 Boy singers (7)
- 14 Character standard code (inits) (5)
- 17 Divide (5)
- 18 Sadden (7)
- 21 North African (8)
- 22 One way or another (7)
- 24 Spring festival (6)
- 27 Brief interval (5)
- 29 Verve (4)
- 31 Companion (4)

ACROSS

- 7, 9, 13 and 15 Fast phone line, in full (10, 8, 7, 7)
- 8 TV prog's annoying program glitches (4)
- 9 See 7 across
- 10 See (6)
- 12 Microsoft's internet beast (8)
- 13 Exotic island's language (4)
- 15 Gerny programming glitch (3)

- 16 Time to reboot (5)
- 19 Visuals input device (7)
- 20 Existing setting unless another has been stated (7)
- 23 Screen dot (5)
- 25 19 across's text capability (inits) (3)
- 26 Electronic input-output point (4)
- 28 Rival of 12 across's company (8)
- 30 and 9 across Peripherals plug-in point (6, 4)

December crossword solutions

- ACROSS**
 7 Saver 8 Wide 9 Plug 11 Screen 12 Analogue
 13 Gate 15 ROM 16 Meter 19 Central 20
 Pentium 23 Cache 25 Web 26 Amps 28
 Megabyte 30 Export 32 File 33 User 34 World
- DOWN**
 1 Talc 2 Vehement 3 Disarms 4 Decay 5
 Oppose 6 Guru 10 Entreat 14 Arena 17 Equip
 18 Pebbles 21 Teaspoon 22 Sweeten 24
 Healed 27 Syrup 29 Edit 31 Rule

Rainbow warrior

If any computer could have seriously rivalled the IBM PC, the DEC Rainbow was it. Sadly, CP/M and bad marketing put a sorry end to it.

Deep in the dark, wild days of real computing — the early eighties — the IBM PC was launched.

Looking at it with the accumulated experience of 15 cynical years, it was a mighty strange thing to do. IBM was best known as a company that made computers the size of a small ocean liner, and yet here it was creating a new market for compact desktop computers.

At the time, Digital Equipment Corporation (DEC) was a successful computer company, making marginally smaller minicomputers including the much-loved PDP-11. My first experience of computers was at school playing text-based Star Trek on a print-console of a PDP-11. We cheered each time the fridge in the corner whirred and trundled through a new computation to plot the course of the Klingons.

Back to the story. DEC obviously decided that since it made smaller machines than IBM, it should be better at making a PC clone. And it was; it just couldn't sell them. So, with a modest fanfare, the DEC Rainbow PC was launched in 1982. The Rainbow was much better than the IBM PC in many ways. For a start, it looked good (although there's still heated debate on whether anything could have looked worse than the efforts from the IBM styling department). The Rainbow also beat the IBM model on various technical points, but it was still not a huge success.

One of the biggest problems with the Rainbow was its operating system. At the time, there were two main operating systems in the PC world: CP/M and MSDOS. Although the latter was, in a round-about way, derived from the former, they were incompatible and the market was split. IBM picked the Microsoft MSDOS product; DEC picked the CP/M product. Enough said.

DEC had also failed to give the Rainbow the marketing push it really

needed. Although it appeared on a few magazine covers around the world, it was not the first name on a buyer's list. And it was with some regret that, on a cold February in DEC headquarters in 1987, the word went out to stop selling the Rainbow. In its death throes, the Rainbow suddenly received a lot of coverage in the trade papers, with amusing headlines like "over the Rainbow".

In the end, DEC sold up to 300,000 Rainbow computers, but this was a drop in the flood tide of seven million IBM PCs that were sold in the same period. Looking back, the choice of CP/M probably played the biggest part in the Rainbow's downfall, in the same way that the IBM's choice of MSDOS and the release of the Lotus 1-2-3 spreadsheet boosted sales of the IBM PC to extraordinary levels.

Just because it had failed with the Rainbow, DEC did not leave the PC market. To compete with the new 16-bit IBM PC/AT model, it launched the DEC VAXmate that was AT-compatible and generally a

good clone. Only by then, Compaq and every other quality clone manufacturer had taken the bulk of the market.

The VAXmate was not a hot seller, so in 1989 DEC decided to try and entice Rainbow users to upgrade to its newest model, the DECstation. Forget the IBM and Compaqs of this world, come to DEC! Actually, it opted for the used-car dealer's trick of accepting Rainbows as trade-ins. DEC offered users up to \$2,200 off a DECstation in return for a tired old Rainbow. For your reference, the DECstation was made for DEC by Tandy and had a choice of either the 16-bit 80286 or 32-bit 80386 processors.

Let's go back to the DEC marketing strategy for the Rainbow. Remember, we're still in 1989, two years after it had been withdrawn. DEC issued a note telling customers that it was holding a sale of fire-damaged computers including stock of the old Rainbow. If you wanted a turkey, you could now have a golden roasted version for the bargain price of \$650 against the list price of \$2,800.

What is interesting is that the Rainbow had a five-year life span. You might smile, but this is pretty good going for any of today's new computer companies, let alone their individual products. Compare it with the technologically astounding Apple Lisa that I covered last month: that had an official life span of just one year, poor thing. In fact, the Rainbow probably had more publicity after its demise than during its heyday.

In 1989, two years after it was withdrawn from the market, companies started making accelerator cards for the Rainbow. Suitable Solutions, of California, came up with a card that allowed your Rainbow to run Microsoft's new Windows/286. Now, since Windows/286 had to be one of the least reliable bits of software available, this was a mixed blessing.

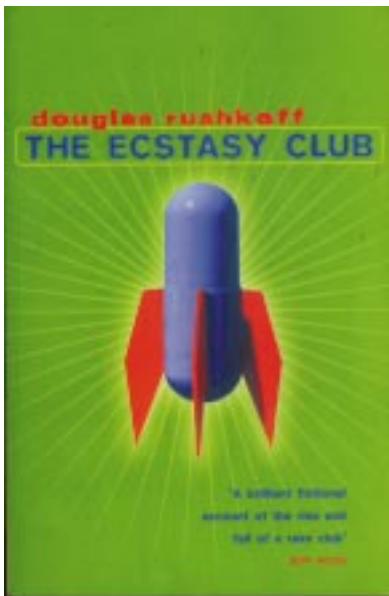
More useful was a utility that turned the Rainbow into a PC-compatible. It was just seven years too late.

Simon Collin



Books

The Ecstasy Club is open, The Truth is hard to find, and Society of the Mind plays mindgames. Books reviewed by Lynley Oram.



■ The Ecstasy Club

The Ecstasy Club is a first novel from Douglas Rushkoff and it is a brilliantly crafted piece of writing. Although I enjoyed the first three quarters of the book, it did annoy me towards the end when the already surreal storyline veered off into the twilight zone. The publisher, Hodder & Stoughton, is hyping the techie side of this book, promoting *The Ecstasy Club* as an electronic playground where hackers and esoteric spiritualists strive to create a new, plugged-in utopia.

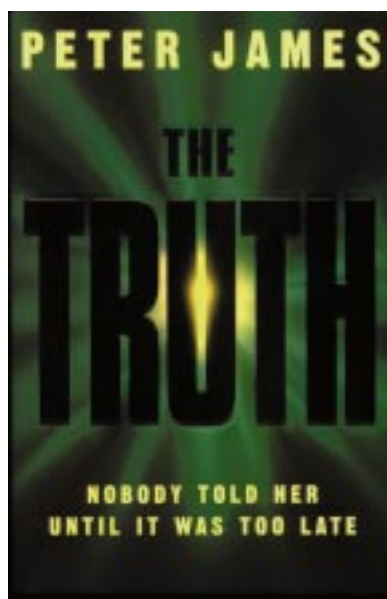
Unfortunately, Rushkoff doesn't really know what to do with most of the hi-tech equipment that his characters manage to acquire. After an initial introduction it all ends up in the periphery, narrative props with which to furnish the storyline. Especially the virtual reality kit, which I found hard to visualise from Rushkoff's scant descriptions.

The setting is a derelict piano factory in San Francisco. A group of the usual disenfranchised nineties twenty-somethings set up house there, converting it into their idea of a commune-cum-rave-venue. The set-up quickly starts to evolve into a kind of cult with, if not quite as many drugs as Timothy Leary et al were able to indulge in,

more than enough to fry the brains of any average mortal.

Narrated in the first person, we see everything through the eyes of Zach, one of the group's founder members. This technique has two effects: it draws the reader into the centre of the story, making you feel like you are part of the group; but it also means that you, as the reader, lose your objectivity. As Zach takes increasingly large quantities of drugs and quickly loses his grip on reality, it is increasingly difficult to separate reality from his paranoid drug haze of a viewpoint.

It will also help if you have had some experience of the rave culture, as this will come in handy when the book descends into one of its more ambiguous periods. However, ultimately this is just a nineties spin on an age-old story — what happens when a group of youngsters get together with the idea of changing the consciousness of the entire world through a mix of drugs and ideology. A bit heavy, perhaps, but still immensely readable.



■ The Truth

Peter James is an outspoken writer who holds some controversial views [see page

184 for an interview with the man himself]. Don't expect *The Truth* to contain any startling or unconventional opinions, though: this is a horror-cum-thriller in the mode of Clive Barker and Stephen King, and it sticks to the formula all the way through.

The story centres around two characters, John and Susan Carter, both in their thirties and both highly intelligent and successful — or so it would seem. A lot of time is spent setting the stage, so that the reader is intimate with the couple and the lives they lead. You feel that you could recognise the street they live in if you happened upon it. This is a great strength of James's writing style, and part of what makes *The Truth* such an engrossing read.

John Carter runs his own multimedia company which is doing stonkingly well, despite the fact that he has vastly overstretched himself financially. Thanks to a technology-junkie of a bank manager who has been more than willing to undersign any loan John requested, he now owes far more than he should. Susan, who has a background in physics, is an editor for a publishing house which specialises in non-fiction, technical books.

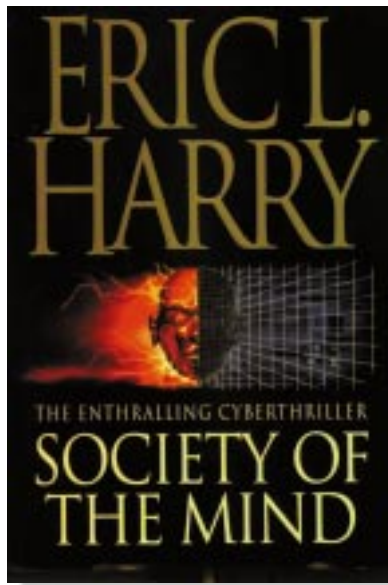
Slowly we start to recognise the peripheral characters, with the baddies recognisable by their love of books and hatred of computers, and the goodies characterised by their scientific and spiritual beliefs. For example, John's world starts to fall apart with the arrival of a new bank manager, a bible-thumping Christian who equates computers with the devil. This is a tantalising theme which James fails to capitalise on: it would have been nice to see some sort of conclusion reached.

As the Carters' cosy world disintegrates, the mysterious Mr Emil Sarotzini steps in with an offer which appears to be the answer to all their problems. The reader, privy to parts of the plot that the Carters are in blissful ignorance of, can see him for the evil, sinister character he is. What keeps you on the edge of your seat is whether the Carters will find out the truth in time to save themselves, and their souls.

Top Ten Books

1	C++ Programming Language 3rd Edition	Addison-Wesley	£27.95
2	Windows NT in a Nutshell	O'Reilly	£14.95
3	Java in a Nutshell 2nd Edition	O'Reilly	£14.95
4	Advanced Perl Programming	O'Reilly	£25.95
5	UML Distilled: Applying the Standard Object Modelling Language	Addison-Wesley	£23.95
6	Windows Annoyances	O'Reilly	£21.95
7	Java Certification Exam Guide for Developers and Programmers	McGraw-Hill	£39.99
8	Word Annoyances	O'Reilly	£16.25
9	Secrets of Successful Web Sites	Hayden Books	£44.95
10	Webonomics	Penguin	£11.99

Prices include VAT. List supplied by The PC Bookshop, 21 Sicilian Avenue, London WC1A 2QH.
Tel: 0171 831 0022. Fax: 0171 831 0443.



■ **Society of the Mind**

Society of the Mind is a cumbersome title for what is essentially a piece of escapism. Just right for curling up in front of the fire with, on those long, dark winter nights.

Set in the year 2003, the story revolves around Laura Aldridge, a psychology professor at Harvard. Not only is she highly intelligent, she's also good looking and in great shape. Romantic interest is provided by Joseph Gray, one of the richest men on the planet. Not only is he thirty, tall, dark and handsome, but he also owns a tropical island complete with launch pad for sending spacecraft into orbit. All very tasty so far.

After a plodding start, the story hot's up when Laura is offered a fee of \$1 million for one week's consultative work of an unspecified nature. Rightly suspicious, she nearly turns the offer down until circumstances in her personal life make the prospect of escaping to a tropical island very attractive. On arrival, she finds herself in a society far removed from the one she left.

Robots perform the most basic functions, from cutting the grass to manufacture. Even the cars are driverless robots. Behind everything the Gray Corporation does, is the Computer — and not just any old digital supercomputer. Joseph Gray has developed an analogue computer which uses varying light intensities for its computations. Interestingly, this computer has developed a personality and gender — female — of its own. And it's not feeling well.

What Laura is doing on the island and what Joseph Gray is really up to, are compelling parts of the story. But it's not so much what is wrong with the Computer, but *why* things are going wrong, that really compels the reader to keep turning pages. Every time you think you can guess what's going to happen next, just as you think this is going to turn into a megalomaniac-computer-rampage story, the author twists everything around and takes you down a different route. Gripping stuff.

PCW Details

The Ecstasy Club

Author Douglas Rushkoff
Publisher Hodder & Stoughton
ISBN 0-340-69680-X
Price £10
★★★

The Truth

Author Peter James
Publisher Orion
ISBN 0-75281-254-8
Price £9.99
★★★

Society of the Mind

Author Eric L Harry
Publisher Hodder & Stoughton
ISBN 0-340-65723-5
Price £16.99
★★★★

Win a **Nitro 3D** graphics card & software bundle

Ten Christmas software bundles with 3D graphics cards to be won, worth £105 each!

Christmas is upon us, and here are some prizes that will put a smile on faces at the end of a long year. STB Systems, the second largest supplier of multimedia accelerators* in the world, is giving away ten Nitro 3D graphics cards with a Christmas software bundle. Each prize is worth £105.

The Nitro 3D is a next-generation 3D accelerator, designed to give game-players and other graphics-driven users the speed, resolution and 3D realism needed to fully experience today's most popular applications. It delivers high-end 2D/3D digital video playback with ultra-high bandwidth video memory, for optimum resolutions and refresh rates of up to 16.7 million colours for photorealistic images. It provides smooth, full frame, full motion playback of MPEG, Active Movie, Direct Video, AVI, Intel Intercast and other video sources. The card also features a fast

170MHz DAC which enables the accelerator to support resolutions up to 1,600 x 1,200 and refresh rates up to 160Hz. There is 4Mb of high-speed video memory.

Texture mapping is used to create impressive and realistic 3D scenes and backgrounds. The Nitro 3D utilises Z-buffering, fogging and depth cue/sort, alpha blending, double-buffering, anti-alias and bi-linear filtered texture maps to achieve unsurpassed 3D speed and realism.

Along with this amazing graphics card, you also win four great software packages:

- 1. HyperBlade** — a fast-paced, multi-player, futuristic sports title featuring real-time 3D graphics.
- 2. MechWarrior 2** — mercenaries in a combat game.
- 3. Simply 3D Limited Editions** — provides



3D animation for Windows 95 and NT.

4. A logo creator for multimedia and the internet, plus **WIRL** by VREAM to experience virtual reality on the web.

**(International Data Corporation)*

■ To win one of these great bundles, answer the following question:

How many megabytes of high-speed video memory does the Nitro 3D have? Is it:

- A** 2Mb
- B** 4Mb
- C** 6Mb

To enter, write your name and address on a postcard, mark it "Nitro/PCW January Comp" and send it to the address shown in the panel at the bottom of page 339.

Closing date is 30th January 1998

Win a **Canon BJC-250**

Two of Canon's latest colour bubblejet printers are up for grabs. And, courtesy of Thomas Cook, you can save money on next year's holiday even if you are not a prizewinner.

Win one of these Canon BJC-250 colour printers and, as an added bonus, you can also claim £139 (ex VAT) off the cost of your 1998 winter or summer holiday!

In conjunction with travel agent Thomas Cook, Canon is giving away two of its latest colour bubblejet printers.

The new BJC-250 can use any of four different print cartridges to give optimal results, whether users are looking for high-speed mono printing or top-quality photographic images. A wide range of print media is supported, including high-resolution paper, transparencies, back-print film, high-gloss film, fabric sheet and T-shirt



Canon **Thomas Cook**

transfer, and continuous banner paper allowing printouts up to six pages long!

If you're not lucky enough to win one of our prize BJC-250s, you'll just have to buy one! But never mind — with the special promotion being run by Canon and

Thomas Cook, you could redeem the cost of your purchase (excluding VAT) against any holiday from the Thomas Cook Holidays 1998 brochure (*see specific promotional offer rules*).

■ To have a go at winning a BJC-250, answer the following question:

What kind of agent is Thomas Cook?

- A** Travel agent
- B** Cleaning agent
- C** Secret agent

To enter, write your name and address on a postcard, mark it "Canon/PCW January Comp" and send it to the address shown in the panel at the bottom of page 339.

Closing date is 30th January 1998

p339 >

Win **£3,400-worth** of small-office business gear

Microsoft, with Demon Internet and Compaq are the big names giving away software and hardware this month — all you could wish for to help you run a successful small business.

Courtesy of Microsoft, Demon Internet and Compaq, we have a bumper business bundle to give away this month. To celebrate the launch of its new software package, BackOffice™ Small Business Server, Microsoft has teamed up with Demon Internet and Compaq to give away, to one lucky PCW reader, a fabulous prize* worth £3,400, comprising:

Software

Microsoft BackOffice™ Small Business Server** is the new server software designed to provide a complete solution, making it easier to run your business.

Hardware

Compaq ProSignia 200, a network server featuring:

- Intel Pentium II 233MHz processor with 512Kb cache, 64Mb EDO memory, a 3.8Gb hard disk drive, a high-performance network card and a CD-ROM.
- Excellent manageability and reliability features.
- Three-year on-site warranty,

Internet connection

Demon Internet one-year account with



Demon Business Dial for reliable access to the net via a single call connection, individual employee email addresses, and 5Mb of server space for your own web site.

Small Business Server Solution

Designed specifically to support companies with up to 25 PCs which already form part

of a computer network. Or, you may not yet have set up a network. Whatever your existing computing equipment, this solution will help your company's future growth.

To enter this fabulous competition, answer the following question:

How many PCs does Microsoft Small Business Server support?

- Send the completed application form (below) to: PCW/SBS Competition, ITM, 47 Aylesbury Road, Thame OX9 3PG, or call the competition hotline (local rates charged) on **0845 2704270**.

Closing date is 30th January 1998

*The prize does not include installation or ancillary costs. **

Microsoft and BackOffice™ Small Business Server are either trademarks or registered trademarks of Microsoft Corporation in the US and/or other countries.

Further information

Microsoft® Small Business server
www.microsoft.com/uk/sbs/
 Information for small businesses
www.microsoft.com/uk/business/

How to enter the Nitro 3D and Canon competitions (from page 337)

- Via our web site at www.pcw.co.uk.
- Or, for each competition you are entering (except for the Microsoft BackOffice competition) write your name, address and answer on a postcard, along with your daytime phone number. Mark your card with the correct name of the competition and send it to: PCW January Competition, P.O. Box 191, Woking, Surrey GU21 1FT. Closing date 30th January 1998.

Only one entry per postcard, please.

- Please state clearly on your entry if you do not wish to receive promotional material from other companies.

Rules of entry

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Job Title Company Name

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SALESPERSON'S NAME

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NAME

COMPANY

ADDRESS

.....

..... POSTCODE

DATE OF TELEPHONE ORDER / /

ORDERED BY: TELEPHONE FAX POST

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ADVERT APPEARED IN PCW:
ISSUE DATE PAGE

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £

METHOD OF PAYMENT

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C.O.D DEBIT CARD OTHER (SPECIFY)

CARD COMPANY START DATE / /

ISSUE NUMBER (debit cards only) EXPIRY DATE / /

CARD NUMBER (below)

SUB-TOTAL _____

DISCOUNT _____

CARRIAGE _____

SURCHARGES _____

VAT _____

TOTAL _____

DELIVERY DETAILS

DELIVERED TO (ADDRESS)

(IF DIFFERENT FROM ABOVE)

.....

..... POSTCODE

BUYER'S CHECK LIST

AGREED DELIVERY DATE / /

TERMS OF WARRANTY MONEY BACK RETURNS POLICY

COST OF EXTENDED WARRANTY HELPLINE

Details:

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No-nonsense Buyer's Guide



...the PCW Buyer's Guide is packed with sensible advice about what to buy and how to buy it safely. Buying direct through our pages can save you hundreds of pounds, but do stick to our 12-point guide to buying direct.

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1. Always use a PCW order form.
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4. On large orders, obtain a written quotation.
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7. Check how the supplier will deliver and whether or not delivery times are guaranteed.
8. Is free telephone technical support included in the price? Some suppliers offer support only on premium 0891 numbers. Is it easy to get through? Try dialling the number to test it out.
9. Is the warranty return-to-base or onsite? "Return-to-base" means that you'll have to pay to ship the product back to the supplier.
10. If you're paying extra for online support, does the manufacturer offer guaranteed response times? If you rely on your PC for your business you'll need it fixed, pronto.
11. Is the supplier reputable? Does it comply with BS5750 or ISO900? If in doubt, ask to see customer testimonials.
12. When your PC arrives, check that all branded components are genuine.

Buying a PC

PCs get cheaper and faster all the time and your state-of-the-art PC can quickly become outdated. That may not matter, though, if it still does what you require. But if you're buying a new general-purpose PC now, it should be fitted with a CD-ROM drive, sound card and speakers so that you'll be able to play games and run a wide range of modern software.

Minimum specifications

- It is a false economy to buy a new PC with less than 16Mb of RAM. The jump from 8Mb to 16Mb of RAM makes a huge difference to performance.
- Ensure Pentium motherboards have an Intel Triton 430 VX, HX, TX or compatible chipset.
- Avoid 14in monitors. The difference between 14in and 15in doesn't sound much but means the screen is 15 percent smaller. If you can afford it, buy a 17in monitor.

Other things to consider

Most small PC manufacturers buy their motherboards from Taiwanese or far eastern manufacturers. Larger companies either design their own motherboards (e.g. Apricot, Compaq, IBM) or get motherboards built to their specification (e.g. Gateway). Intel chips are no longer the only choice. AMD's K6 processors are well worth considering, too. It is amazing how hard disks fill up and it's unusual to have *too much* disk space.

Some suppliers offer you the choice of Windows 95 or Windows NT. For general home or small office use, Windows 95 is still the best choice. You may need to consider NT for some specialist applications like programming, DTP or CAD.

Practically every month, CD-ROM drives get faster. Higher speeds and bigger numbers just mean you can access files from them more quickly and that video clips on them play more smoothly.

Look closely at the software that's bundled with your PC. If you want an Office suite it's usually cheaper to buy it bundled with your PC. Software bundles can also be an excuse for manufacturers to unload piles of old or second-rate software. Check whether you get the original media if you need to re-install.

For this Buyer's Guide we've drawn up four specifications. We haven't mentioned particular manufacturers because you'll find up-to-date PC reviews in every issue of PCW.

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Anthony George

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PCW Second-hand spec

Buying second-hand or discontinued kit is the cheapest way to get started. This is the minimum spec we think you should choose for general business use, playing games and accessing the internet.

- Windows 3.1 or 3.11
- DX2 66MHz 486 processor
- 8Mb RAM
- Graphics card with 512Kb of memory
- 200Mb hard disk
- 3.5in floppy disk
- CD-ROM drive
- 14in colour monitor

PCW Minimum specification

This is the absolute minimum spec we think you should consider if you are buying a new PC. Suitable for general business use: word processing, databases, spreadsheets and, with a modem, accessing the internet.

- Windows 95
- 133MHz Pentium-class processor
- 16Mb RAM
- Graphics card with 1Mb of memory
- 1.2Gb hard disk
- 12-speed CD-ROM drive
- 15in colour monitor
- PCI local bus

PCW Recommended spec

If you are not short of cash, this is the specification we recommend. No-one at PCW would settle for less.

- Windows 95 or Windows NT 4.0
- Pentium or equivalent 166MHz processor
- 256Kb secondary cache
- 32Mb EDO RAM
- Graphics card with 2Mb of memory
- 2Gb hard disk (modern computer software takes up a lot of space)
- 12-speed CD-ROM drive
- 17in colour monitor
- 16-bit SoundBlaster-compatible sound card

PCW Best specification

This is as good a PC as you are likely to need for most software. For some specialist applications, like professional DTP or CAD, you may need even more memory, a bigger hard disk, a more powerful graphics card or a larger monitor.

- Windows 95 or Windows NT 4.0
- Pentium 233MHz MMX or Pentium II
- 512Kb secondary cache
- 32Mb EDO memory
- 4Gb hard disk
- 16- or 20-speed CD-ROM drive
- 17in colour monitor
- 4Mb VRAM or WRAM graphics card (this means your graphics card can display more colours, and at a higher resolution on your monitor: 16 million colours at a resolution of up to 1,280 x 1,024)
- 16-bit wavetable sound card

Buying a Notebook

Notebooks belong in the one area in which it is often safer to stick to brand names. It is not so much that some of the Far Eastern kit doesn't work perfectly well, but reliability seems to be a problem and it can be fiendishly difficult to obtain spares. A useful guideline when choosing a notebook is to try before you buy.

Remember that standard notebook specifications are generally a step or two behind their desktop equivalents.

What to look for in a notebook

- **Pointing device** There has been a move away from trackballs to trackpads. Some notebooks, notably IBM Thinkpads, use stick technology (a device which looks like the rubber on top of a pencil and is controlled by the use of one finger).
- **CD-ROM drives** These are rapidly becoming standard in notebooks. If your notebook is going to be your only machine, it's worth getting one.
- **Floppy disk drive** Often, there is a choice between a CD-ROM drive and a floppy disk drive. If the notebook is to be your only machine, make sure that the CD-ROM drive and the floppy drive can be used simultaneously.
- **PC Cards** Modern notebooks all have at least one PC Card slot. They take credit card-sized expansion cards which add a fax-modem, a network interface card or even an extra hard disk to your computer.
- **Battery life** Battery life varies, from as little as 30 minutes to over six hours. Lithium Ion and Nickel Metal Hydride batteries have now replaced the older NiCad (Nickel Cadmium) batteries.

- **TFT screens** TFT screens are of a higher quality than dual-scan or passive-matrix screens, using a sharper picture and no shadowing or ghosting.
- **Warranty** Drop a notebook and it may break, so it is vital to check the terms of your warranty. How long is it? What level of service is provided? Remember — better safe than sorry.

PCW Minimum specification

Notebooks change quickly. It is possible to pick up end-of-line machines with Pentium processors from brand-name manufacturers like Toshiba and Compaq at discounted prices of £1,000 or less. These can be a very good buy. Just make sure they can run the software you need to use.

PCW Recommended spec

- Windows 95
- Pentium 133
- Quad- or six-speed CD-ROM drive
- 16Mb RAM
- On-board graphics with 1Mb of memory, PCI local bus
- 850Mb hard disk, 3.5in floppy disk drive and/or dual-speed CD-ROM drive
- TFT 800 x 600 screen

PCW Best specification

The state-of-the-art notebook: either you're loaded, or your company's picking up the tab.

- Windows 95 or Windows NT
- Pentium 166MMX
- 256Kb secondary cache
- 32Mb RAM
- On-board graphics with 2Mb of VRAM memory, PCI local bus
- 1.2Gb hard disk
- 3.5in floppy disk drive
- Eight-speed CD-ROM drive
- Active matrix 1,024 x 768 TFT screen
- Long battery life



Glossary

of computing terms

A

Access time

The time it takes for a device to access data. The access time, quoted in milliseconds (ms) for hard disks and nanoseconds (ns) for memory, is usually an average as it can vary greatly. Together with the transfer rate, it is used to gauge the performance of hard disks and other devices. The lower the number, the better the performance.

Applications

An application, or package, is one or more programs used for a particular task. For example, word processing, invoicing or spreadsheeting. Applications are bought shrink-wrapped (wrapped in cellophane for general use) or custom-built for specific uses.

ASCII (American Standard Code for Information Interchange)

Usually a synonym for plain text without any formatting (like italics, bold or hidden text). Since computers naturally use binary rather than Roman characters, text has to be converted into binary in order for the processor to understand it. ASCII assigns binary values to Roman characters. RTF, a Microsoft standard, adds extra formatting features to plain ASCII.

B

Backwards compatible

Compatibility of hardware or software to older versions of the product or standard.

Baud rate

The number of electronic signals that can be sent along a communications channel every second. In common usage, it is often confused with bits per second. These days modem speeds are normally measured in bits per second. (See V and Bit).

BIOS

Basic Input/Output System. Software routines that let your computer address other devices like the keyboard, monitor and disk drives.

Bit

Binary digit, the basic binary unit for storing data. It can either be 0 or 1. A Kilobit (Kbit) is 2^{10} (1,024 bits); and a Megabit is 2^{20} , which is just over a million bits. These units are often used for data transmission. For data storage, megabytes are more generally used. A megabyte (Mb) is 1,024 kilobytes (Kb) and a Kb is 1,024 bytes. A gigabyte (Gb) is 1,024Mb. A byte (binary digit eight) is composed of eight bits.

Bug (See Crash)

Boot

Short for bootstrap. Refers to the process when a computer loads its operating system

into memory. Reboot means to restart your computer after a crash, either with a warm reboot (where you press Ctrl+Alt+Del) or a cold reboot, where you switch the computer off and back on again.

Bus

A "data highway", which transports data from the processor to whatever component it wants to talk to. There are many different kinds of bus, including ISA, EISA, MCA, and local bus (PCI and VL-bus).

C

Cache (See Memory)

COAST

Cache On A Stick.

CD-ROM

A CD-ROM is the same as a normal audio CD, except it can store data as well as sounds. A CD-ROM player can be attached to your computer to read information from the CD-ROM into the computer's memory in the same way that a domestic CD player reads information from the CD into your hi-fi. The advantage of distributing information on CD-ROM rather than other media is that each one can hold up to 680Mb of data: equivalent to about 485 high-density 3.5in floppy disks. The disadvantage, however, is that you can only write once on CD-ROMs, yet this makes them ideal for archiving.

CISC (See RISC)

CPU

Central Processing Unit. Normally refers to the main processor or chip inside a PC. (See Processor.)

Crash

Common term for when your computer freezes. Can be caused by a power surge, a bug (which is a fault in software) or a GPF.

D

DRAM (See Memory)

DOS (Disk Operating System)

Once the standard operating system for PCs, it is now being replaced by Windows 95 and Windows NT.

DPI (Dots Per Inch)

Common measure of the resolution on a printer, a scanner or a display.

Drive controller card

An expansion card that interprets commands between the processor and the disk drives.

Drivers

Pieces of software that "drive" a peripheral. They interpret between the computer and a device such as a CD-ROM. If you have a SCSI CD-ROM drive connected, you will be able to use it on a PC or a Mac just by loading up the relevant driver on each machine.

E

EIDE (See IDE)

EISA (Extended Industry Standard Architecture)

A bus standard designed to compete with MCA. Now being replaced by PCI.

Electronic mail (E-mail, email)

Still the biggest single use of the internet. When you sign up with an ISP you are given an email address. Usually you can incorporate your name, or part of it, into your email address to make it easy to remember.

Expansion card

Circuit boards which fit inside PCs to provide extra functionality. For example, one might be an internal modem, providing the same functions as an external version (which is more common) but sitting inside the PC. Expansion cards are designed to be fitted and removed by people with little knowledge of PCs.

F

Floppy disk drive

Practically all PCs come with a floppy disk drive: 3.5in HD (high density) 1.44Mb floppy disks are now the standard. They come in hard plastic cases and have replaced the older, literally floppy, 5.25in disks.

Fonts

A font is an alphabet designed in a particular style. Fonts apply both to screen and printed letters. TrueType and Type 1 fonts are stored as shape descriptions, scalable to any size.

Format

To wipe a floppy or hard disk in order to prepare it to accept data.

G

GPF

General protection fault.

Graphics card

An expansion card which interprets commands from the processor to the monitor. If you want a better, higher-resolution picture or more than your existing setup, you'll need to change your graphics card and/or your monitor.

GUI (Graphical User Interface)

(See Windows)

H

Hard disk

Sometimes called a fixed disk, hard disks are hermetically sealed rigid disks able to store data and programs. Disk capacities increase all the time. The standard is now 1Gb but disks of up to 9Gb are available.

Hardware

All electronic components of a computer system, including peripherals, circuit boards and input/output devices.

HTML (Hypertext mark-up language)

The standard language used in the creation of web pages, which can be read by web browsers.

I

IBM-compatible

Originally meant any PC compatible with DOS.

Now tends to mean any PC with an Intel or compatible processor capable of running DOS or Windows.

IDE (Integrated Drive Electronics)

A control system designed to allow computer and device to communicate. Once the standard for PC hard disks, now being replaced by EIDE (enhanced IDE) which offers improved performance and extra features.

Internet

Millions of computers interconnected in a global network.

ISP (Internet Service Provider)

ISPs provide access to the internet. You use your modem to dial the ISP's modem. The ISP has a high-bandwidth permanent connection to the internet.

IRDA (Infra-Red Data Association)

The standard for exchanging data using infra-red, typically from PDAs or notebooks to a PC or printer.

ISA (Industry Standard Architecture)

This was the original bus architecture on 286 PCs. Also known as the AT bus (the 286 was known as the AT), it remains in use today. Slow by modern standards, but so widely accepted that expansion cards are still made for it. (See EISA, PCI.)

ISDN (Integrated Services Digital Network)

Offers significant advantages over analogue telephone lines. It can handle multiple transfers on a single connection and is faster. In the UK, however, costs of installation and rental remain high.

J

JPEG (See MPEG)

K

Kbit (kilobit), Kb (kilobyte)

(See Bit)

L

LAN (Local Area Network)

(See Network)

Local Bus

PCI (Peripheral Component Interconnect), developed by Intel, is now the standard for local bus architecture. It is faster than the older VL-Bus (Video Electronic Standards Association local bus) it replaces.

M

Macintosh (Mac)

A personal computer made by Apple and which is incompatible with PCs. Developed as a rival standard, its operating system looks like Windows but pre-dates it and (in some people's view) looks and works much better.

Maths co-processor

A specialised chip that handles mathematical calculations (floating point operations) for the processor. Modern processors such as the Pentium have a co-processor built into them.

Mbit (megabit) (See Bit)

Mb (megabyte) (See Bit)

MCA

A type of bus designed by IBM to beat EISA. Although faster, it never became popular: this was because every machine that used it had

to pay a royalty to IBM, and because it was not backwards-compatible with ISA.

MPEG (Moving Picture Expert Group)

A standard for compressing video, available in several flavours: MPEG 1, MPEG 2, MPEG 4. JPEG (Joint Photographic Expert Group) is a standard for still image compression.

Memory

The term normally refers to RAM (Random Access Memory). This is the kind which disappears when you turn off your computer and is much faster to access than a hard disk. It acts as a staging post between your computer's hard disk and its main processor.

● **Cache memory** Temporary memory set aside to store the information that is accessed most frequently. The Pentium processor has 8Kb of in-built cache. This can be further speeded up by a secondary cache, typically 256Kb. Part of your DRAM is often used to cache your hard disk.

● **DRAM (Dynamic Random Access Memory)** This requires its contents to be replaced every one thousandth of a second and is the most common form of memory found in PCs.

● **EDO (Extended Data Out RAM)** Memory that is cached to improve performance.

● **FPM RAM (Fast page mode)** Like EDO Ram but without the onboard cache

● **ROM (Read-Only Memory)** A type of memory which can only be read: you can't make changes to it as you can to RAM. It is commonly used for things that will never need to be changed, like the information the computer requires when you start it up.

● **SDRAM (Synchronous DRAM)** The latest type of fast memory. This runs at the same speed as the processor and allows the input and output of data at the same time.

● **SRAM (Static RAM)** Retains memory until the power is switched off.

● **VRAM (Video RAM)** Faster than DRAM, this is used by graphics cards.

MMX (Multimedia extensions)

(See Pentium)

Modem

The word is a contracted version of "modulator/demodulator", which means that a modem is a box (or, less commonly, an expansion card) that lets your computer talk over phone lines to other computers.

Monitor

Your computer's screen. Signals are sent to it from the video card.

Motherboard

The main printed circuit board which houses processor, memory and other components.

N

Network

A network is a group of computers linked together with cable. The most common form of network is a LAN (Local Area Network), where electronic mail and other files can be exchanged between users without swapping floppy disks. Printers and other resources can be shared. All the PCs on a LAN are connected to one server, which is a powerful PC with a large hard disk that can be shared by everyone.

O

OS (Operating System)

The operating system communicates with the hardware and provides services and utilities to applications while they run, such as saving and retrieving files.

P

PC Card

Formerly PCMCIA. A standard to allow PCs, particularly notebooks, to be expanded using credit card-sized cards.

PDA (Personal Digital Assistant)

Small electronic organisers. The Psion 3a is a typical example.

PCI (See Local bus)

PCMCIA (See PC Card)

Package (See Applications)

Parallel ports

Used by your PC to communicate with the outside world, usually via a printer. Information can travel in parallel along a series of lines, making it faster than serial ports which can only handle one piece of information at a time.

Pentium

Fast 32-bit processor with a built-in 16Kb cache. Now the standard on PCs. It is about to be replaced by the Pentium MMX chip which has extra instructions and a 32Kb cache. The Pentium Pro is a higher-end workstation CPU with 256Kb cache meant for full 32-bit operating systems like Windows NT.

Pixel

Picture element. The smallest addressable dot displayed on a monitor.

PowerPC

This family of RISC chips is the result of a collaboration between IBM, Apple and Motorola. It is now used in all Apple Macintosh computers and many IBM workstations.

Processor

Chip which does most of a computer's work.

Programs (See Applications)

Public domain

Software that is absolutely free. The author usually retains the copyright but you can make as many copies as you want and pass them to other people. "Public domain" software is often confused with "shareware".

Q

QWERTY

The name of a standard English-language keyboard, derived from the first six letters in the top row. French equivalent is AZERTY.

R

RAM (Random Access Memory)

(See Memory)

Reboot

(See Boot)

RISC (Reduced Instruction Set Computing)

These are beginning to replace CISC (Complex Instruction Set Computing) as they're usually faster. The PowerPC chip is a typical example.

ROM (Read Only Memory)

(See Memory)

RTF (Rich Text Format)

(See ASCII)

S

SCSI

Small Computer System Interface is a bus that comes as standard in a Macintosh and is beginning to rival EIDE on PCs.

Serial port

Serial ports (com1 and com2) are used by your PC to communicate with the outside world. Mostly used by modems and similar devices which communicate quite slowly. Faster communications are achieved through the parallel port.

Shareware

A method of distributing software. It is freely available, but not free of charge. You are honour-bound to pay a small fee to the software's developer if you continue to use the program after a set period.

SIMM (Single Inline Memory Module)

The standard modules for memory expansion on PCs. Older 30-pin SIMMs have now been replaced by the 72-pin variety available in capacities up to 16Mb.

T

Tape streamer

Magnetic tape recorder for backing up data from a hard disk.

U/V

UART (Universal Asynchronous Receiver Transmitter)

Pronounced "you-art", this is a chip that allows

your PC to cope with high-speed communications.

V.34 Plus, V.34, V.32bis

A series of CCITT standards which define modem operations and error correction. There are more than 20, but the key ones are:

- **V.32bis**, the standard for 14.4Kbps (kilobits per second) modems.
- **V.34**, the standard for 28.8Kbps modems (see Baud).
- **V.34 Plus**, the new standard for speeds up to 33.6Kbps.

VESA (See Local Bus)

VGA

Video Graphics Array is the name given to a popular display. VGA graphics have 640 pixels horizontally and 480 vertically, and can display 16 colours. SuperVGA (SVGA) graphics can display 800 x 600 or 1,024 x 768 in as many colours as the memory in your graphics card will allow: up to 16.4 million, or true colour.

VL-Bus (See Local Bus)

VRAM (See Memory)

W

Windows

A GUI (Graphical User Interface) developed by Microsoft. Windows is intended to make programs easier to use by giving them a standard, mouse-driven interface.

- **Windows 3.11** 16-bit operating system.

- **Windows NT** Robust, fully 32-bit operating system from Microsoft. The latest, version 4.0, features a Windows 95 interface.

- **Windows 95** Major improvement to Windows 3.11, with a redesigned interface. Less prone to crashes and easier to use, but requires more memory.

Winsock

Short for "sockets for Windows". The Winsock.dll is an extension for Windows which is necessary for connecting to TCP/IP networks.

World Wide Web

Service on the internet using special software called web browsers (Netscape and Internet Explorer are two best-known browsers) to give access to pages of information with text, pictures and multimedia.

WYSIWYG

"What You See Is What You Get": what you see on the screen is exactly what you will get when you print out your work.

Z

ZIF (Zero Insertion Force)

Sockets used for large CPUs. Lifting a handle enables you to remove the processor.

ZIP

The common standard for compressing files so that they take up less space. Zipped files have the extension .zip and are compressed and decompressed using shareware utilities such as Winzip and PKZip.

Buying a Printer

There are two main types of printer: laser and inkjet.

Lasers

Most office printers are lasers. They work much like photocopiers. They are cheap to run and print quickly. The disadvantage is the higher initial cost and mono output. Laser printers are available in all sizes and all prices. Small desktop printers cost as little as £300. You can buy colour laser printers but they are still expensive; typically £5,000 or more.

Types of laser

PCs print by sending a description of the page to be printed down a printer cable. There are three commonly-used page description languages (PDLs):

- **PostScript**

This sends an outline in vector form (see Drawing Software) to the printer where it is rasterised (converted into dots) and printed to the device's best ability. PostScript is device-independent so the image looks the same on a monitor (75dpi), a laser printer (300dpi) and a professional image-setter (2,400dpi).

- **PCL (Printer Control Language)**

Hewlett-Packard's alternative to PostScript,

licensed to many clone-printer manufacturers. Printers using PCL tend to be cheaper than PostScript ones, but output will vary from one machine to another, making it less well suited to professional use.

- **GDI (Graphical Device Interface)**

These printers download the description of your page, already used by Windows, straight to your printer. They only work with Windows but are cheap and fast. They are only suitable for a personal printer and will not work across a network.

- **Inkjets**

Inkjets work by spraying ink onto paper. There are still some mono inkjet printers available, but it is best to stick with a colour inkjet as the price difference is negligible. They are cheap to buy but more expensive to run, and slower. Even cheap inkjets can print in good-quality colour, especially on high-resolution paper.



PCW Recommended products

Inkjet printers

- **Canon BJC-80:** RRP £233; Canon 0121 680 8062 (PCW January 98)
- **ALPS MD-1000:** RRP £299; ALPS 0800 973405 (PCW January 98)

Laser printers

- **Cheap:** **Brother HL 730:** £270; Brother 0161 330 6531
- **Sharp JX9210:** £209; Sharp 01753 819819 (PCW January 97)
- **Sub-£750:** **Hewlett-Packard 5P:** HP 01344 369222 (PCW November 95)
- **Network lasers**
- **Hewlett-Packard 5M:** RRP £1,659 ex VAT; HP 01344 369222

Buying a **Multi Function Device**

For home use and in small offices, a hybrid device could be the answer.

Typically, MFDs combine a printer, a fax machine and photocopying and scanning capability into one device. And while this saves space, it does have some drawbacks. For one thing, they tend to be based on inkjet technology which means higher running costs and lower speeds than laser-based units. Many only offer black-and-white printing: while colour models are appearing in greater volume, they tend to be based on earlier inkjet printing technologies rather than the current state-of-the-art models. Also, the scanning quality is no match for a dedicated scanner:

it's normally only 200dpi, which is the same quality as a fax machine and, worse, often black-and-white only. Finally, there's one fundamental problem — if your MFD breaks down, you won't be able to print or receive faxes. That said, they are here to stay, and some people love 'em.



PCW Recommended products

Hewlett-Packard OfficeJet: £650;
HP 0990 474747 (PCW January 97).

Buying a **Digital Camera**

Just about every camera manufacturer now offers a budget-priced device and prices start from as little as £135.

A digital camera works like a conventional camera except that instead of a film, it has a grid of light-

sensitive elements. These convert light into a voltage proportional to the brightness, which is then converted into digital information the PC can understand.

The elements produce a colour bitmap file, typically of 640 x 480 pixels, although models boasting 800 x 600, 1024 x 768 and even higher resolutions are becoming increasingly common.

Most digital cameras use flash memory to store images, and offer a wired connection to a computer — slow serial on budget models or fast SCSI on professional ones.

Some cameras feature removable memory cards, usually compatible with the PC

Card standard. Quality is getting better all the time, but to match the print quality of a 35mm film camera today, you'll still have to spend thousands of pounds. The current crop of entry-level to mid-range cameras are, however, more than suitable for electronic publishing on CD-ROM or the internet.



PCW Recommended products

Sony DSC-F1: £546; Sony 0990 424424
(PCW January 98)

Sanyo Digicam: £449.99; Sanyo 01923 477295
(PCW January 98)

Epson Photo PC: £781.38; Epson 0800 289622
(PCW Jan 98)

Choosing an **ISP**

With over 100 ISPs to choose from, choosing an Internet Service Provider has never been so difficult.

All ISPs (Information Service Providers) allow you to send and receive email across the Internet, browse and surf the world wide web and download files from Internet servers. But there are big differences between the quality of service that each provides in terms of technical support and the quality of software supplied when you first sign up. Usually they

charge a flat monthly rate for Internet access of around £10, but on top of that you also have to pay for your phone charges

■ **Choosing a Content Provider**

There are really only three players in this field: AOL, CompuServe and MSN. They are not the best or fastest way of browsing the world wide web. Instead they aim to supply their own content in the form of discussion areas, online magazines and easily searchable file libraries. All these services offer free trials which is a good way of finding out if they're for

PCW Recommended products

Our PCW Award winners in July 97:
Pipex Dial: Major player with an excellent reputation.

BT Internet: BT has now got its act together with internet service provision.

Direct Connection: One of the best of the smaller ISPs.

Content providers

AOL: 0171 385 9404; Consumer-orientated service that offers good performance even for users of older 14.4K modems.

CompuServe: 0800 289378; more business content than AOL.

Buying a **Monitor**

Regardless of your computer application, you'll be looking at your monitor all day, so make sure you get a good one.



Some people claim not to see monitor flicker, but your brain does, resulting in fatigue and headaches. A refresh rate of 70Hz or higher will produce a flicker-free image on most monitors.

Interlacing also results in flicker. Always run in non-interlaced modes and ignore interlaced quotes. The resolution refers to the number of dots (pixels) horizontally and vertically on-screen. Standard VGA mode runs at 640 x 480 pixels, while other typical modes include 800 x 600 and 1,024 x 768. The more pixels, the more you'll be able to fit on the screen, but

everything will be smaller and may only be suitable on a larger screen. Go for a 15in or 17in monitor capable of running a resolution of 1,024 x 768 non-interlaced at 70Hz or higher.

The visible area of most monitors (and TVs for that matter) is smaller than the model implies: a 15in screen may only have a 14.5in visible area, and a 17in may have only 16in visible. Aperture grille tubes such as Sony's Trinitron or Mitsubishi's Diamondtron are very bright, but need two fine but visible wires running across the screen for stability.

PCW Recommended products

Panasonic Panasync 5G (£385 ex VAT); **Taxan EV750** (£493 ex VAT); **ADI 5G** (£429 ex VAT); **Iiyama Vision Master Pro 17** (£510 ex VAT). See PCW May 97 for reviews.

Contacts Panasonic 0500 404041; Taxan 01344 484646; ADI 0181 236 0801; Iiyama 01438 745482



Buying a **Scanner**

Scanners are used to import text, graphics or pictures into a PC. They vary from low-cost hand scanners not much bigger than a mouse, to drum scanners costing thousands of pounds. The latter are designed to scan photographic transparencies to professional standards.

■ Flatbed scanners

These are the most common type of scanner, and cost from around £300 to more than £3,000.

They are capable of scanning colour pictures to a high standard. Most have transparency adaptors as optional extras.

■ Document scanners

A new category of scanner which aims to combine the reliability of a flatbed scanner with speed and portability. They are intended for OCR and document management. Most will cope with photographs and some with colour, but it's not really their forté.

PCW Recommended products

Document scanners

Visioneer PaperPort VX: street price £299; Computers Unlimited 0181 200 8282
Logitech PageScan Colour: street price £155; Logitech 01344 894300

Flatbed scanners

• **Intermediate**
Agfa Studio Star: street price £499 (ex VAT); Agfa 0181 231 4906 (PCW August 97)
• **Budget**
Umax Astra 600-S: street price £169 (ex VAT); IMC 01344 872800 (PCW August 97)
Agfa Snapscan: street price £169 (ex VAT); Agfa 0181 231 4000 (PCW August 97)

Buying a **Storage Device**

For backup and storage there's a range of devices available — conventional tape backup devices, superfloppies like the LS120 and proprietary systems like the Iomega Zip drive.



Additional storage devices, taking removable media, offer endless capacity. Iomega's ZIP drive and OR Technologies' a: drive (aka LS120) offer 100Mb and 120Mb respectively. The a: drive is an alternative to a floppy as it is compatible with normal floppies. The ZIP drive only works with ZIP cartridges.

Iomega's Jaz drive and SyQuest's SyJet, take 1Gb and 1.5Gb respectively. The SyJet is quicker and boasts cheaper media, but it's new as against Iomega's proven device.

Larger storage means slow, cheap tape

drives with big capacity, perfect for overnight backup. Most quote compressed capacity, double "native" uncompressed capacity. DAT DDS-2 drives offer 4Gb native, which Seagate matches with faster Travan TR4 cartridges on its TapeStor 8000. Iomega's cheaper, slower Ditto 2000 offers 2Gb compressed backup.

CD recorders, offering double-speed writing and quad-speed reading, are around £400 ex VAT. The fastest are 24-speed, but there's little benefit in anything over 12.

PCW Recommended products

Iomega ZIP drive: internal £89 ex VAT; 100Mb media £10 ex VAT; Iomega 0800 973194 (PCW August 97)

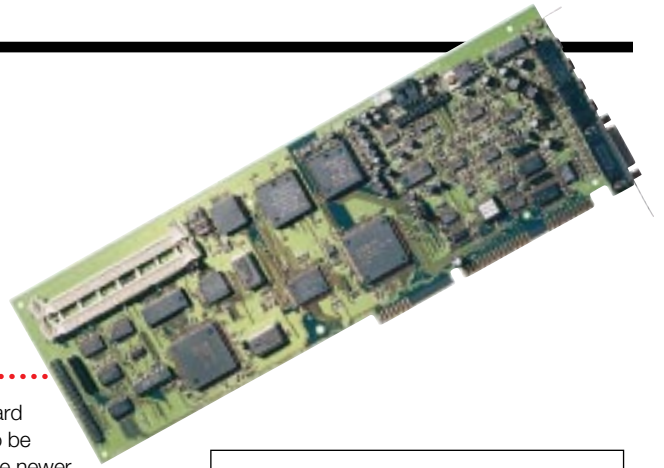
Iomega JAZ drive: internal £189 ex VAT; 1Gb media £60 ex VAT; Iomega 0800 973194 (PCW August 1997)

Iomega Ditto 2000: external £89 ex VAT; Iomega 0800 973194 (PCW July 97)

Seagate TapeStor 8000: internal £220 ex VAT; Seagate Technology 01628 890366 (PCW July 97)

Buying a Sound Card

You need one of these to add sound capability to your PC.



Check compatibility with your CD-ROM drive, and remember that 16-bit cards capable of 44KHz provide higher-quality sound than slower 8-bit cards. Better sound cards now include wavetable synthesis which means they have samples of real instruments held in ROM.

The quality of wavetable synthesis still varies widely. Even cheap cards which have the inferior Frequency Modulation synthesis

should have a daughterboard connector allowing them to be upgraded to wavetable. The newer cards are also plug and play which means, in theory, that you should be able to plug them straight into a PC without any extra configuration. Most cards are bundled with extra software, normally sequencers, wave editors and audio players.

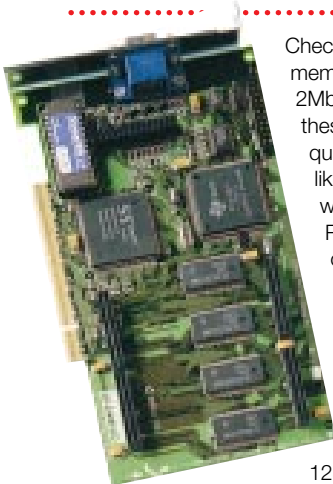
PCW Recommended products

AWE 64 Gold: £199; Creative Labs 01734 344322 (PCW June 97)

Maestro 32/96: £139; Terra Tec 01635 294394 (PCW June 1997)

Buying a Graphics Card

The graphics card sits inside the PC and controls the features which the software displays on the monitor.



Check the amount of memory on the card. 2Mb is standard these days. Better-quality cards are likely to be fitted with VRAM (Video RAM). Also, check out the performance capability of the card. Video cards come as 16-bit, 32-bit, 64-bit and even 128-bit: a large

number of bits means faster performance.

The most important aspect of your video card, and the most frequently quoted feature, relates to the resolution that the card supports in Windows. This is measured by the number of pixels the card displays on-screen. The absolute minimum these days is 1,024 x 768 with a refresh rate of 70Hz.

A 2Mb card can display 16-bit colour (65,000 colours) at 1,024 x 768 pixels. A 1Mb card can manage only 8-bit colour (256 colours) at 1,024 x 768 pixels. To display 24-bit colour (16 million colours) at 1,024 x 768 you'll need 4Mb of memory. The refresh rate (measured in Hz) is important, too. It represents the number of frames displayed on-screen per second. A flickering display is very tiring to use.

Find out if your video card is "local bus". Local bus (PCI or VL) is an interface which connects your video card to the motherboard. It allows the memory in the card to be addressed directly by the CPU, which makes it a lot faster than the standard ISA interface.

PCW Recommended products

ATI Xpert@ play: £163 (4Mb); ATI 01628 533115

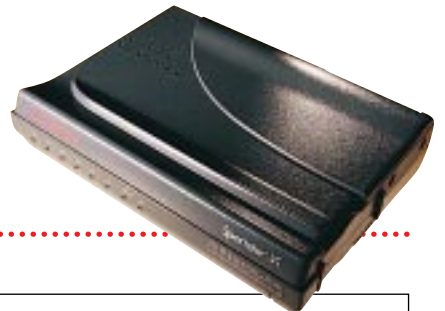
Hercules Stingray 128/3D: £210 (6Mb); Hercules 01635 294300

Orchid Righteous 3D: £132; Orchid 01256 479898

(All from this issue, PCW January 1998)

Buying a Fax Modem

You'll need a modem to connect to the internet or an online service, such as CompuServe or AOL, and also to send and receive email.



Modems are available in three formats: either as PC Cards to plug into notebooks, or as external boxes, or as expansion cards. PC Card modems are the most expensive, while external modems cost slightly more than expansion cards.

Apart from the casing and the external power supply, there is often very little difference between the internal and external

versions of a modem. Most now have a built-in fax capability, which means you can receive faxes on your personal computer to view or print out.

Go for a V.34 28.8Kb/sec modem or one of the new V.34+ 33.6Kb/sec modems. Or, look out for the new 56K versions: these use one of two rival technologies but as yet are unsupported by Information Service Providers.

PCW Recommended products

Fax modems

- Internal

Pace 56 Voice: £169; PMC 0990 561001 (PCW November 97)

Buying Software

Only a few years ago there were dozens of different software applications in each category. During the past two years or so, however, there has been rapid product consolidation. Other magazines list large numbers of packages, most of which are out of date and not worth considering. We've distilled each category down to just one or two recommended products.

A

■ **ACCOUNTS SOFTWARE** One of the few categories in which there are still masses of packages on the market at a huge range of different prices. Accounts is also one of the last bastions of DOS.

Recommended products: MYOB, Intuit QuickBooks.

B

■ **BROWSERS** are programs which are used to navigate the internet. A modern browser lets you navigate web pages, download files and send and receive email.

Recommended products: There are only two worth talking about: Netscape Navigator and Microsoft Internet Explorer.

C

■ **CAD SOFTWARE** Computer Aided Design covers everything from architectural drawings, through office planning, to complex engineering drawings.

Recommended products: AutoCAD is the industry standard but we think MicroStation 95 is a more capable product at the high end of the market. At the cheap end, DesignCAD 3D offers astonishing value for money.

■ **CONTACT MANAGERS** (See PIMs)

D

■ **DATABASE** At its simplest, an electronic card index. For just a few hundred names and addresses an electronic-type Filofax, such as Lotus Organizer, may be more appropriate. But for more sophisticated applications like tracking products and customers, the power of a relational database is required. Databases are generally the least user-friendly of the main suite applications. In most offices you are likely to use a database

application that somebody else has written for you.

Recommended products: Lotus Approach, Microsoft Access.

■ **DESKTOP PUBLISHING SOFTWARE (DTP)** This is software used to create newsletters, magazines, books, brochures or advertisements.

Typically, it enables you to incorporate graphics, lay out text in multiple columns and run text around graphics. You also have control over how text appears, in varying degrees of sophistication.

Recommended products: The high-end market leader is Quark XPress on the Mac. On the PC, PageMaker is strong. For serious work on a budget we recommend Serif Publishing Suite, and for sheer ease of use, Microsoft Publisher.

■ **DRAWING SOFTWARE** Programs for drawing, which work using vectors. This means each shape drawn is described using mathematical equations.

Recommended products: At the budget end of the market, MicroGraphx Windows Draw 5 stands out. At the professional end, Corel Draw 7 gets our vote.

■ **IMAGE EDITING SOFTWARE** A program for editing bitmap files (files made up of pixels). Typically used for converting graphics files, retouching photographs and preparing pictures for printing.

Recommended products: For simple image editing the popular shareware program, PaintShop Pro, is fine. For professionals, Adobe's Photoshop is the industry standard.

■ **INTEGRATED PACKAGES** Typically, these combine the functionality of a database, word processor and spreadsheet in one application. This makes it easy to move data from one component to another but

integrated packages tend to lack some of the advanced features of individual applications.

Recommended product: Microsoft Works.

J

■ **JAVA.** A language based on C++, but easier to learn and use. Java runs on a "virtual machine" interpreter, so programs can run on many different platforms.

Recommended products: Borland JBuilder

M

■ **MULTIMEDIA AUTHORING TOOLS** Programs designed for producing interactive multimedia applications; typically for training applications or for CD-ROMs. The software lets you control and manipulate different types of media such as sound files, audio files, video clips and graphic files.

Recommended product: Macromedia Director, the product used to produce PCW's cover-mounted CD-ROM, gets our vote.

O

■ **OCR SOFTWARE** Optical Character Recognition software converts printed text into computer text you can edit. You will need a scanner or fax card to get the printed text onto your PC. OCR saves re-keying documents and can cut down drastically on paper filing systems.

Recommended products: OmniPage is the best product we have found, but TextBridge offers most of the same capabilities for less cash.

P

■ **PERSONAL INFORMATION MANAGERS (PIMs)** PIMs are an electronic way of storing names, addresses, phone numbers and appointments. Contact managers take the idea one step further to include business information about dealings with clients.

Recommended products:

SideKick 95 and Organizer are excellent PIMs. For contact managers we would recommend Goldmine for Windows.

■ **PRESENTATION GRAPHICS** Increasingly, the trend is towards doing presentations on a PC and the latest packages tackle this by including sound, sophisticated transitions between slides and support for video clips.

Recommended products: Powerpoint and FreeHand are both capable products sold with Microsoft Office and SmartSuite respectively.

■ **PROGRAMMING TOOLS** Applications designed for writing software. These range from "low-level" languages which are powerful but difficult to learn and use, to "high-level" languages which, although much easier to use, generally sacrifice performance and flexibility in the process. Commercial programs like Word for Windows are written using low-level languages.

Bespoke applications and prototypes are often written using Delphi or Visual Basic.

Recommended products: Delphi 3.0 is a great example of scalability, catering for beginners and serious developers working on major projects. Optima Power++ is the pick of the high-end Windows development tools.

■ **PERSONAL FINANCE PACKAGES** These help manage home finances. They are also well suited to some small businesses and tend to be easier to use than full-blown accounts packages.

Recommended product: Quicken is the outstanding product in this category and has no serious rivals.

■ **PROJECT MANAGEMENT** Programs for managing large projects — anything from building a power station to planning a

marketing campaign.

Recommended product:
SuperProject 4.0 for Windows.

R

■ **REMOTE CONTROL S/W** Lets you access and control a PC remotely, usually via a modem.

Recommended product:
ReachOut, for its simple interface and support for different networks, particularly TCP/IP.

S

■ **SPREADSHEET** This is an electronic version of what would be an old-fashioned ledger.

Excellent graphing and charting facilities are included.

Recommended products:
Lotus 1-2-3, Microsoft Excel.

■ **SUITES** Most general business software is now sold in suites.

Two suites are widely available: Lotus SmartSuite and Microsoft Office. Lotus SmartSuite also contains a database. With Microsoft Office, you pay extra for Office Professional which contains Microsoft's Access database.

Recommended product:
Microsoft Office is close to the

industry standard. Its high level of integration gives it the edge over the opposition.

V

■ **VISUAL PROGRAMMING** (see Programming Tools)

W

■ **WEB EDITORS** Programs designed to do for web page design what DTP did for magazines and newsletters. They let you create web pages without writing HTML. You can incorporate graphics, backgrounds, tables, images and sounds.

Recommended products:
HotMetal Pro 3.0 is our first choice, while Adobe Pagemill is a capable alternative.

■ **WORD PROCESSOR** An application in which you can write letters and prepare reports, or produce a simple newsletter. The latest word processors have advanced features such as outliners, table editors and facilities for adding columns of figures.

Recommended products:
Microsoft Word is the clear market leader but WordPro is a capable alternative.

A-Z of Recommended Software Products

■ *If you would like to read any of the reviews of software listed here and do not have the original issues, you can order Personal Computer World on CD-ROM. It costs just £9.95 (including postage and packing). See pages 328/329 for full details.*

	Category	Product	Supplier	Contact	Price (ex VAT)	Date of PCW review
A	Accounts	MYOB	Bestware	01752 201901	£195	April 1997
	Accounts	QuickBooks	Intuit	01932 578501	£125	April 1997
B	Browsers	Netscape Navigator	Netscape	0181 564 5100	£49	Mar 1997
	Browsers	Internet Explorer	Microsoft	0345 002000	Free	Jun 1996
C	CAD	Microstation	Bentley	01344 412233	£3,495	Jan 1997
	CAD	DesignCAD 3D	BVG	01874 611633	£149.95	Jan 1997
D	Database	Approach 97	Lotus	01784 455445	£40	Oct 1997
	Database	Access 97	Microsoft	0345 002000	£235	Oct 1997
	Desktop publishing	XPress 3.3	Quark	01483 454397	£795	May 1997
	Desktop publishing	Publisher	Microsoft	01734 270000	£70	May 1997
	Desktop publishing	Publishing Suite 3.07	Serif	0115 9421502	£99	May 1997
	Drawing	CorelDraw 7	Corel	0800 973189	£495	Sept 1997
I	Drawing	Windows Draw 5	MicroGraphx	0345 089372	£38.30	Sept 1997
	Image editing	Photoshop	Adobe	0181 606 4000	£382	Dec 1996
	Image editing	PaintShop Pro	Digital Workshop	01295 258335	£49.95	Jun 1995
	Integrated package	Works/Win 95	Microsoft	0345 002000	£93.61	Apr 1997
J	Java programming	JBuilder	PowerSoft	01628 597100	£399	N/A
M	Multimedia authoring	Director 5.0	Macromedia	0181 200 8282	£99	Oct 1996
O	OCR	PaperPort Plus	Visioneer	0800 973245	£58.72	Dec 1997
	OCR	Presto! OCR Pro 3.0	Guildsoft	01752 895100	£58.72	Dec 1997
P	Personal finance	Quicken	Intuit	0800 585058	£34	May 1996
	PIM/contact manager	Organizer 2.1	Lotus	01784 455445	£99	Jun 1997
	PIM/contact manager	Goldmine for Windows	Elan Software	0171 454 1790	£395	Jun 1997
	PIM/contact manager	Sidekick 95	Starfish UK	0181 875 4400	£39	Jun 1997
	Presentation graphics	Freelance	Lotus	01784 455445	£415	Nov 1996
	Presentation graphics	Powerpoint	Microsoft	0345 002000	£220	Nov 1996
Programming tools	Power ++ 2.0	PowerSoft	01628 597100	£345	Sept 1997	
	Delphi 3.0	Borland	01734 320022	£89	Apr 1997	
Project management	SuperProject 4.0	Computer Associates	01753 679679	£495	May 1996	
R	Remote control/Access	PC Anywhere	Symantec	01628 592320	£139	Nov 1997
S	Spreadsheet	Excel	Microsoft	0345 002000	£220	May 1995
	Spreadsheet	1-2-3	Lotus	01784 455445	£365	May 1997
	Suite	Office (Standard)	Microsoft	0345 002000	£360	Jul 1997
	Suite	Office (Professional)	Microsoft	0345 002000	£460	Jul 1997
W	Web authoring	HoTMetal Pro 4.0	SoftQuad	0181 387 4110	£69	Jan 1998
	Web authoring	FrontPage 98	Microsoft	0345 002000	£99	Jan 1997
	Word processing	Word	Microsoft	0345 002000	£220	Oct 1996

ChipChat



■ In November's Remote Access software group test we printed the wrong contact details for LapLink 7.5. The correct details are: Traveling Software, tel 01344 383232, www.travsoft.com.

■ In last month's First Impressions review of the NEC SuperScript 1260 we stated that the expected toner life of this printer is 600 pages at five percent coverage. The actual figure is 6,000 pages at five percent coverage.

■ In last month's Undercover PC group test we printed an incorrect telephone number in the features table for Golf Computers. The correct number is 0800 0720361.

We apologise to our readers and group test participants for any confusion caused by these errors.



Virtual Guest a seedy ROM-Shell

Girls! Are you looking for that special something for your man, off the beaten PC

Caption competition



"Now that's not the first laptop I've put my finger on"

Think you can do better? Email captions@vnu.co.uk or enter via our web site, or write to the usual PCW address with your own captions on a postcard marked "January Caption Compo" before 15th January. We'll print the funniest entry and the winner will receive a £20 book token.

Congratulations to Martin Griffiths, who won November's caption competition with this: "What do you mean? Tuning into Channel 5 has never been easier"



track? Those boffins at the Daily Star have invented a not-so-PC gift for any bloke's PC! The Star is releasing Love Bytes (£19.99) for Christmas, a screensaver sensation that should leave computer eggheads gasping! Buy your man Love Bytes and he'll get his very own "virtual" Page 3 stunner, Jo Guest.

It's easy to mock, PCW readers, but in

fact, Love Bytes is a serious project that should interest anyone keen to explore the symbiotic relationship between man and machine. Ms Guest has put in hours of research on various garment-removal techniques in a bid to put the Daily Star's site, Mega-Star, at the forefront of "virtual world" technology.

PHREAKS

