Personal Computer World

NEW Windows NT column p262

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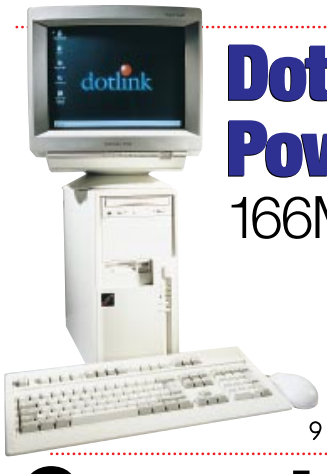

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NEW PCW CD-ROM

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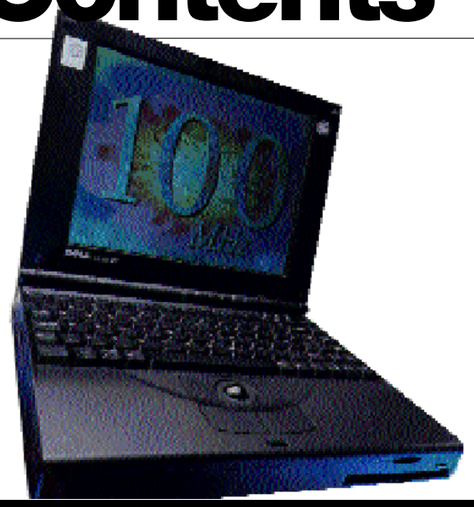

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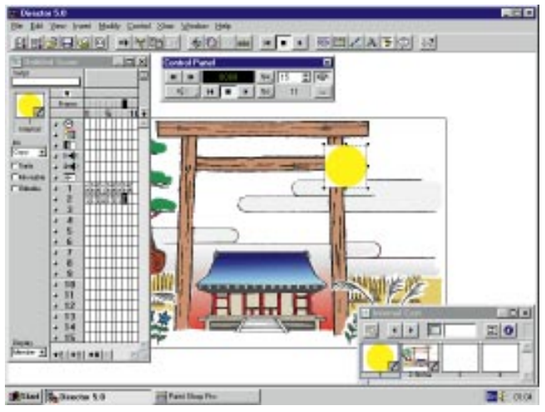

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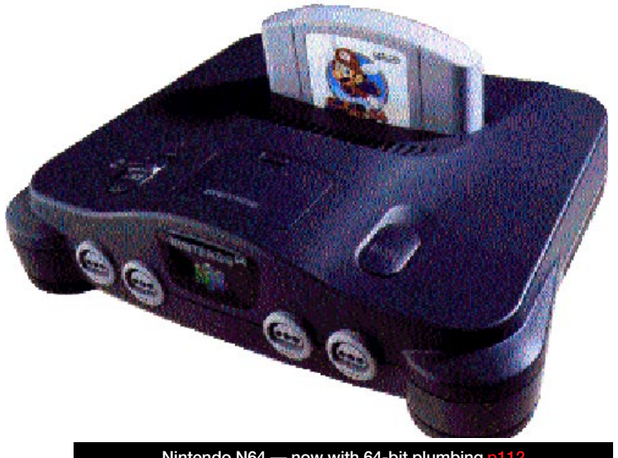

Nintendo N64 — now with 64-bit plumbing p112

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Hands On

Direct Buyers' World

The place in PCW where you can compare prices on a wide range of hardware and software. The card insert on page 348 marks the start of the section.

Our Product Locator, on page 514, lists advertisers by product category, making it easier to find what you're looking for.

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Editorial

During the past few months, we've researched what readers do and do not like about *PCW*. The good news is that in general they love the magazine, the bad news is that some people had trouble finding their way around.

This month, we've redesigned with two main aims: to make the design clearer and more consistent, and to make the organisation of the magazine more logical. This means that our *First Impressions* reviews section (p62) has been expanded to include reviews of CD-ROM products and educational software. We have also introduced a simple star rating system for all the products reviewed in *PCW*. *Cutting Edge*, which starts on page 216, now focuses entirely on the internet and on new technological trends.

Our *Hands On* section (p251) is now identified by a purple stripe down the side of each page. New this month is a *Windows NT* column, written by Dale Strickland-Clarke. Every month *Hands On* will now kick off with a "How To" article, starting with a series on SQL by database expert Mark Whitehorn and continuing after Christmas with a series on Visual Basic. At the back of the magazine, you'll find our new *Leisure Lines* section (p506). This draws together all the more light-hearted stuff we regularly include in *PCW*: *Chipchat, Computations, Brainteasers, Screenplay, Retro computing* and our competition.

Also new this month, and by popular demand, is an advertisement product locator (p514). You use it to find all those advertisers who sell a particular type of product. It complements the regular advertisement index which you'll find on page eight.

Finally, don't forget to check out our updated *No Nonsense Buyers Guide* (p328) . It's full of sensible advice and product recommendations and should help you to spend your money wisely. As ever, if there's anything about the redesign you don't like or you think we could do better, email us at PCW@vnu.co.uk or write to the address on p52.

Ben Tisdall

Group Editor ■

Next Month

Next month, the new-look *PCW* continues to set the pace as Britain's best computer magazine.

V34+ Modems

The new standard.

Group Tests

Inkjet Printers. Probably the second most important purchase after your PC. We test the best

Databases

Cutting-edge packages go head to head

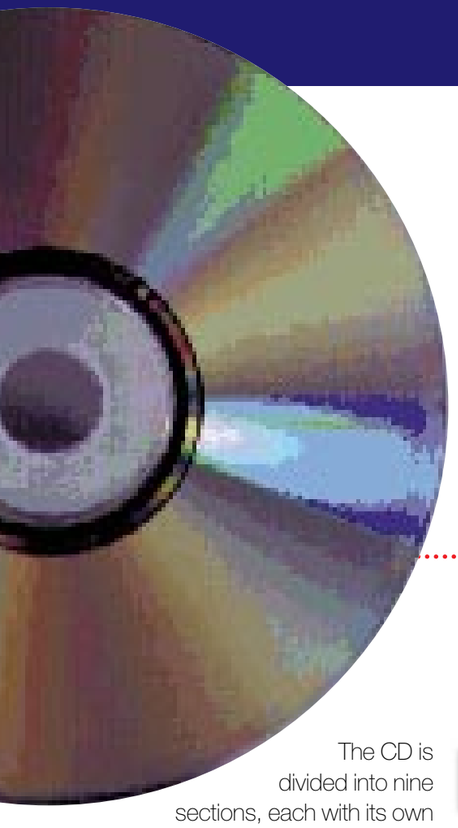
Presentation Tools

Full marks for presentation.

November 96 issue
■ On sale Thursday 3rd October

December 96 issue
■ On sale Thursday 7th November

** Next month's contents subject to change*



Personal Computer World

October
Cover disc

Introducing issue no. 2 of our new-look PCW CD-ROM cover disc. This month we have put together over 600Mb of games, resources, images, music and much more for your enjoyment.

The CD is divided into nine sections, each with its own icon. Each section is almost always visible on-screen and you can move from section to section just by clicking on the appropriate line. If you are not sure which section is where, roll over the buttons and the name of that section will be displayed. Exit the disc by clicking on the "Q" in the bottom left of the screen.

How to use the CD-ROM

1. Quit existing applications.

2. Put the disk into your CD-ROM drive.

3. Win 95: If you've got Windows 95, the PCW Interactive loader will appear on your screen. If your CD doesn't auto-load, start Windows Explorer and double-click PCW.exe.

Win 3.1: From Windows Program Manager choose File/Run, then type in <CD Drive>:\PCW.exe and press enter.

4. Click on main menu. If you don't have Quicktime for Windows and Video for Windows installed you will be offered the chance to install them before continuing.

■ Pressing the esc key at any time quits PCW Interactive.

Hardware requirements

To run the CD-ROM, you need a PC with Windows 3.1 or later and a colour VGA display. We recommend a multimedia 486 or Pentium PC with a minimum 8Mb of RAM. The optimum configuration is a 16Mb Pentium.

Music in the form of MIDI files and 24-bit colour images. To get the most out of the 12 classical MIDI compositions you will need a wavetable sound card correctly configured for Windows (most good sound cards today support wavetable sound). Ordinary cards will work, but the instruments won't sound terribly realistic.

How and why we redesigned the magazine

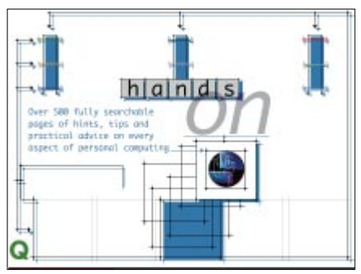
A video discussion about the redesign of *Personal Computer World* magazine.

Preview the three games on this month's CD. Some games you can play straight away. Others may need to be installed first, or can only be played from DOS.

A goalmouth scramble in Games

A beginner's interactive guide to notebooks and PCs.

Install and launch the Acrobat reader to view and search *PCW* Hands On articles from the past year.



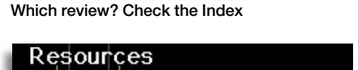
Get your hands on a year's worth of Hands On

The Multimedia section contains the latest interactive Windows demos.

The Unexplained, a full multimedia experience

PCW reviews index, advertisers' index, glossary, and information about the CD.

Which review? Check the Index



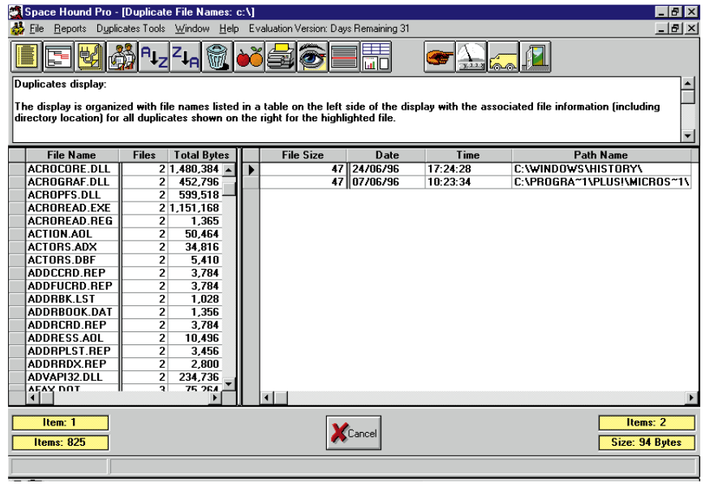
A library of shareware, fonts, utilities and drivers, each with a brief description which can be copied onto your hard disk, using Netscape.

Browse through VNU's web e-zine and view an episode of the "Stoney Blokes". Then, look out for our competition to win a copy of Macromedia Director 5.0.

Stone me, it's the Stoney Blokes!

Floppy disk

This month, we've put together a great selection of Windows 95 utilities.



■ **Space Hound** — roots out wasted hard disk space.

■ **Exe Spy** — monitors processes running on your PC.

■ **Free Cell Plus** — an improved version of the Win95 Free Cell card game.

■ **Netscape Cache Explorer** — lets you browse offline.

To install the utilities, select File Run from Windows and type A:\PCW.EXE. To install the utilities from the CD-ROM, go to the "floppy" directory and click on floppy.exe.

■ Fast Track

If you already have your own frames compatible browser installed and want to access the resources section on the CD, run your browser, go to File Open and open D:\html\res\resource.htm

POSSIBLE PROBLEMS

■ If you have problems with the floppy such as a message "cannot read from drive a:" please return the disk to TIB PLC, TIB House, 11 Edward Street, Bradford BD4 7BH, together with an SAE and two 25p stamps. Where it is a duplication fault the postage will be returned with your replacement disk. TIB is on 01274 736990.

■ Our floppy disk hotline is available on weekdays from 10.30am - 4.30pm on 0891 715929.

■ PCW cover disks are thoroughly virus checked, but PCW cannot accept liability for problems arising from use of the disk.

You are advised not to install any software on a networked PC without checking it first.

Cover disc notes

CompuServe special CD-ROM

Sign up a new membership with CompuServe via this month's cover-mounted CD-ROM and take advantage of one of these great bonus gifts.

★Exclusive CompuServe offer to PCW readers.

What's on the CompuServe CD-ROM

- The very latest interactive online tour.
- The latest version of the CompuServe connection software WinCIM 2.0.1
- The award-winning Netscape Navigator 2.01
- Internet Phone — software from VocalTec that lets you to speak to anyone over the internet, throughout the world, for the price of a local phone call.
- Shockwave — with this, Netscape Navigator users can view interactive multimedia on the web including animation, sound and high resolution scalable and zoomable digital art.
- Home Page Wizard — an easy-to-use software application that allows CompuServe members to create and publish their own home pages free of charge. (GO HPWIZ)
- WorldsAway — the fun way to meet people online by accessing the fantasy world of Dreamscape. Here, CompuServe members can represent themselves as animated figures, walk around and communicate in real time with other members. (GO AWAY)
- SSEYO KOAN Pro — enables you to produce low-bandwidth music that can be played on the internet. (GO UKMUSIC)
- Lotus SmartSuite (45-day copy) — a leading integrated office suite.

Choose your bonus gift

PGA Tour 96

Sharpen up those golfing skills by competing against the pros from the PGA Tour. This is the most realistic golf game on the PC and features 3D courses with hills and valleys. Dynamic TV-style presentations include picture in picture view and user-controllable fly-bys. You can choose either to play like one of the featured pros, including Fuzzy Zoeller, Tom Kite and Craig Stadler, or to play against them. You'll experience golf like never before and it's so simple that with only three mouse clicks you'll be playing golf with some of the best in the world. Available on PC CD-ROM only.

Free credit for your CompuServe account

If gaming is not your thing, then why not claim some extra online time with this exclusive offer to Personal Computer World readers who join CompuServe through our cover-mounted CD-ROM. Select this option to claim a $30 usage credit on your CompuServe account — the equivalent to ten hours' online time!

Offers apply to UK and Northern Ireland members only.

How to register for your bonus gift

1 Once you are on CompuServe, click on the traffic-light icon and type UKPCWFREEBIE at the GO command to claim your bonus gift.
2 Follow the on-screen instructions and select the gift of your choice.
3 When prompted, enter your membership details and the unique nine-figure serial number (starting with 275) that is shown on the back of the card in the CD-ROM's plastic wallet.

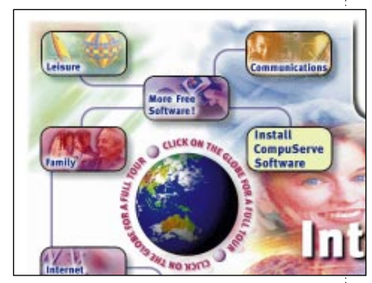
For more information and free phone technical support, ring 0800 000 400

How to join CompuServe

If you are not online with CompuServe already, you will need to join up in order to participate in this promotion. To do this, you can use CompuServe's WinCIM software (together with Netscape Navigator) which you will find on the CompuServe CD-ROM on this month's cover.

How to install the software

- **1.** Insert the CD in your CD-ROM drive.
- **2.** From Windows Program Manager, select RUN from the file menu. In Windows 95, let Autoplay start your CD or click on Start, then RUN
- **3.** Type d:DEMO in the Command Line box and click OK (where "d" is the letter of your CD-ROM drive). This will launch the new Interactive Tour.
- **4.** From the main menu, you can click on "Install CompuServe software" at any time to begin installation.
- **5.** Follow the on-screen instructions, making sure you select "Yes" when asked to copy the sign up files.
- **6.** Enter the unique Agreement and Serial Numbers when prompted. These are located on the back of the card which is inside the plastic wallet. Do not throw this away as you will need it to claim your gift!



Multimedia & Featured Software

- To preview any of the multimedia demonstrations, drag one of the images along the bottom into the box in the top right corner.

Icon Author — a powerful authoring system.
Perfect Plants — a gardening CD-ROM.
The Unexplained — an exploration into things that are beyond the explanation of modern science.

- Installing and/or playing the demos from outside the multimedia section, from Windows' file manager or Explorer:

Icon Author — double click the file AIMSETUP.EXE in the directory D:\
Perfect Plants — To install a shortcut icon from which to start the program, double click the file PLANINST.EXE in the directory D:\MULTI\. Or, to play direct from the CD, double-click the file PLANTS.EXE in the directory D:\MULTI\PLANTS\
The Unexplained — double-click the file SETUP.EXE in the directory D:/

Games

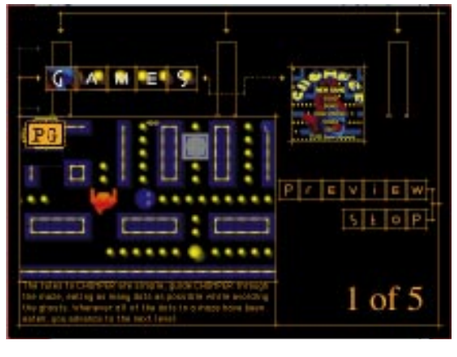
To preview any of the games, drag one of the images along the bottom into the box in the top right corner.

Quake v1.01

Quake was created by ID Software, the people who brought you Doom. In this game you are on a mission from the government, armed with a choice of weapons, to fight against QUAKE (the code-name of an evil organisation). Like in Doom, the network gameplay is great.

To install Quake from outside the Games section:

• Windows 3.1 users — quit Windows and from the DOS prompt type: <CD Drive>:\GAMES\QUAKE\INSTALL.BAT
• Windows 95 users — from Explorer, double-click on the file INSTALL.BAT in the directory D:\GAMES\QUAKE\



Hungry? Chomper will satisfy your appetite for a good game

Note: This installation will use about 18Mb of disk space.

Kick Off 96

This game is your chance to make the biggest impact on british football in 30 years. You are given a choice of over 15,000 players from which to create your own dream team to play in customised competitions.

To install Kick Off 96 from outside the Games section:

• Windows 3.1 users — quit Windows and from the DOS prompt type: <CD Drive>:\GAMES\KICKOFF\KO96.EXE to play directly from the CD using the default settings, or: <CD Drive>:\INSTKICK.BAT to install the game using your own settings.
• Windows 95 users — from Explorer, double-click on the file KO96.EXE in the directory D:\GAMES\KICKOFF\ to play directly from the CD using the default settings, or from Explorer, double-click on the file INSTKICK.BAT in the directory D:\ to install the game using your own settings.

Chomper

Chomper is a Pac-Man style game. The rules are simple: guide CHOMPER through the maze, eating as many dots as possible while dodging the ghosts.

To install Chomper from outside the Games section: from Windows' file manager or Explorer, double-click the file CHMPINST.EXE in the directory D:\GAMES\CHOMPER\

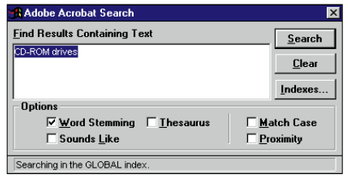
Dream-team heaven can be yours

Please note: the demos featured in the Games and Multimedia sections can be previewed and some will run from the PCW main interface. However, due to technical issues concerning the software supplied to us, some demos will not run alongside the interface and others require installation to your hard disk.

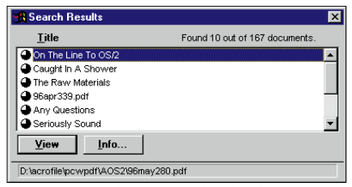
Using the Hands On section

Load Acrobat either by selecting Hands On from the launch menu or by going into the Hands On section of the main menu.

To search Acrobat files, just click on the



Just type in the word you want to search for — in our case, CD-ROMs



In a second or two, a list of all the files containing that word will appear

icon. A dialogue will appear. Just type in the word you want to search for and click the search icon. In a second or so, the search results dialogue will appear containing a list of the files containing that word.

You can then view any of the files. The word you search for (CD-ROM drives in our example) is highlighted. On average-sized monitors the text will be greeked but you can use the magnifying glass icon to expand the text. Just click on the icon then select the area of the page you want to magnify, with your mouse.

The default index for the Acrobat files is a global search of all files. You should find the global search quite fast enough. If you're looking for a very common word however, such as "Windows", you may want to narrow the search. To do this, click on the indexes button in the search dialogue then click add, and add any additional indexes which have the prefix PDX and are located in

<CD Drive>\ACROFILE\PCWPDF\

Using the resources section

Because the resources section uses Netscape, files are downloaded just as you would do from the World Wide Web. Most files in this section are compressed Zip files or self-extracting archives.

To download a file, click on the hypertext link (the name of the program in blue, underlined type). This will bring up the "save as" dialogue box. You can then choose where you want to save the file. It's a good idea to create a directory or folder for it first, using Windows Explorer or file manager.

Avoid copying files into your Windows directory or into the root of drive C:\.

Using File Manager, Explorer, or My PC go to the directory into which you have put the file.

Provided you've "installed" and "associated" PKUnzip or Winzip (see Installing PKUnzip, below) or if the file is self-extracting (an .exe file rather than a .zip) you just double click on the file name to expand it into its component files.

You can then run the program or its installer by double-clicking the file name.

Using Netscape

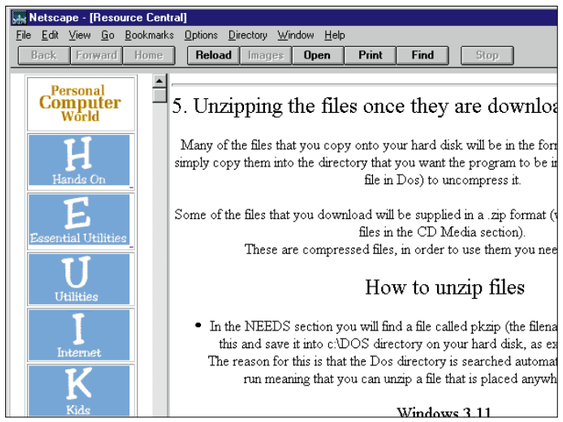
The Personal Computer World Interactive CD-ROM uses Netscape as the delivery mechanism for the resources section and to run the Room e-zine.

If you're on the internet, chances are you're already using Netscape and have a rough idea how it works. If you're not, this provides a great opportunity to find out what this browser business is all about.

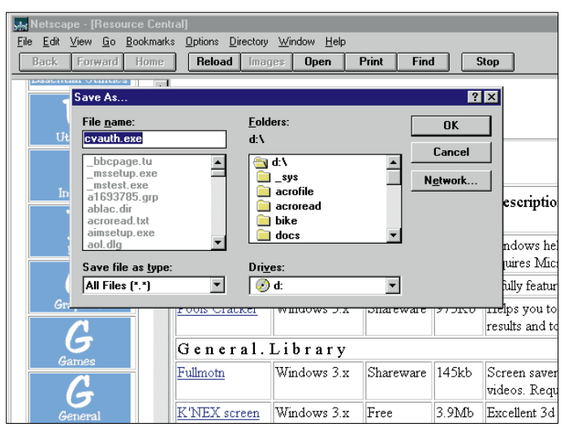
You navigate through web (or HTML) pages using hyperlinks. These are images, or more often highlighted text which take you backwards or forwards through different pages. You can also move back and forth through pages you've already visited, by using the back and forward arrows on the toolbar.

Netscape 2.0 also has a feature called "frames". This divides the screen into separate areas. When using frames, the right mouse button is used to move backwards and forwards, rather than the arrow keys.

When using Netscape from within PCW Interactive you'll need to go to File/Exit to return to the main screen.



One of the help links from the resources pages



Downloading the files to your hard disk, from the resources section

Installing PKUnzip or Winzip

Zip files are the standard compression format for distributing programs and utilities on the World Wide Web and on floppy disk.

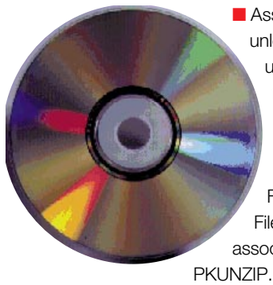
Before you can "unzip" most of the resource files in this section (.zip files) you will need to install PKUnzip or Winzip.

Go to the Essential Utilities section and click the link "PKZip/PKUnzip" or "Winzip".

■ Winzip: choose Winzip and a new page will appear, offering you Winzip for Win95 and Winzip for Windows 3.11. Select the appropriate utility then use the "Save As…" dialogue to choose where to save the file.

If you have less than 16Mb of RAM it's probably a good idea to quit Navigator and the PCW CD next. Then use File Manager or Explorer to find Winzip95.exe or wz60wn16.exe.

■ PKUnzip: choose PkUnzip and you will be offered the option to save pkz204g.exe onto your hard disk. The C:\DOS\ folder is as good a place as any to save it. After you've quit Navigator and the PCW CD, double-click on the file to expand it into 16 separate files.



■ Associating the file: unless you intend to use DOS to unzip files (laborious and tricky) you need to associate .zip files with PKUnzip. From File Manager choose File Associate to associate *.zip files with PKUNZIP.EXE. Under Windows 95, zip files will be associated automatically.

Possible CD-ROM problems

1. If you have launched Acrobat reader in the Hands On section, and cannot find the search icon that is described in the first page notes, then this may be because you already have a copy of Acrobat reader on your C: drive and so the autostart for this cover disk is not asking you to install our version which includes the search facilities.

You can either delete your Acrobat reader from the C: drive, or change its name and run PCW.EXE again, which this time should ask you to install the Acrobat reader with search facilities.

2. If you get a message such as "Not ready reading drive D:" you may have a dud CD.

Return it to: TIB House, 11 Edward Street, Bradford, DB4 7BH for a free replacement.

For other problems concerning the CD, call 0891 616444. Calls cost 39p/min off-peak and 49p at all other times.

October 1996

PCW INTERACTIVE:
Entire Contents List

Multimedia section

- Icon Author
- Perfect Plants
- The Unexplained

Games section

- Quake v1.01
- Games section
- Kick Off 96
- Chomper

Arts section

- 12 classical MIDI masterpieces from Liszt, Elgar, Couperin, Chopin, Rachmaninov, Wagner, Albeniz and Mozart
- 32 graphic images from the Image Bank.

Personal Computer World

Getting Started

- A beginner's interactive exploration of notebooks and desktop PCs

Focus on

- A video discussion about the redesign of *Personal Computer World* magazine.

F O L D H E R E

Hands on

- Hints, tips and practical advice on every aspect of personal computing

The Room

- A browse through VNU's new e-zine

Resources section

- Some of the files referred to in the *Hands On* section of the magazine.
- Avery Label Templates
- Backlash
- Chachchk
- Chess
- CV Author
- Deskview
- Farnsworth Ferret's Fun
- Media
- Fullmotn
- Gazillionaire
- Global positioning system software
- Help Maker Plus
- Invaders
- K'NEX Screensaver
- Klik-N-View
- Meeja
- MicroAngelo v2.1
- Morpher 2
- Paintshop Pro
- PKzip, PKUnzip
- Ponger
- Ponger 32
- Pools Cracker
- Power Strip v2.1
- Screen Thief 95
- Snowman
- VBRUN 100,200,300,400
- Video for Windows
- Web Seek
- *What PC?* Mobile Pages for Series 3a
- Wincode
- Winsock Swapper
- Winzip
- WS Archie

Reference section

- 15-month products and features archivable database
- Advertisers' index
- General information about the CD
- Glossary of computer terms

Wanted

We are always on the lookout for material for our cover-mounted CD-ROMs. If you think that you have something that might be suitable such as software, pictures, fonts, demos and so on, please let us know. Either email Barrie Maylott (barriem@vnu.co.uk) or Steven Rogers (stevenr@vnu.co.uk) or ring them on 0171 316 9370. *Please note that Barrie and Steve cannot deal with technical support.*

Newsprint

Netscape reels as Gates launches killer web app

Microsoft delivered a body blow to browser pioneer Netscape with the official launch last month of its Internet Explorer 3.0. The new browser has been almost universally judged to be faster, richer (*see story below*) and leaner than Netscape's Navigator.

Internet Explorer 3.0 can be downloaded from ftp://ftp.microsoft.co.uk

It makes Microsoft the world leader for browser technology less than a year after it U-turned and staked its future on the net, putting massive resources into web research and development.

Uunet-Pipex communications director Dave Barrett described the browser war as a "classic example of the benefits of competition". But it must rank as one of the oddest, as both Netscape and Microsoft have been giving their browsers away.

This policy, a legacy of early net idealism, paid off at first for Netscape by hooking as many as nine-in-ten web users. With any other product this would guarantee Netscape's future but the browser business is like no other, and web users have grown accustomed to changing their browsers every few weeks to keep up with developments. Moreover, Netscape, whose browser revenue stems largely from company licences, has taken to timing out its releases to prompt users into registering. This could drive them into the Microsoft fold, where the browser is free — and, at this stage, better.

Having given away Navigator in the first instance, Netscape can hardly complain that Microsoft's gift constitutes unfair trading. But it has cried foul over the web provision in Microsoft's new NT 4.0 (*see page 33*)

Microsoft announced a raft of service providers who will switch to IE3 as their default browser. They include Demon, UUNet Pipex, BT, a new consortium of smaller providers called ISPC, and CompuServe. AOL, the biggest, had already opted for the product.

Unix and Mac versions will be available by the end of 1996, the Mac one leading to stories that Microsoft is propping up Apple to stave off anti-monopoly suits (*see page 36*). **Clive Akass**

■ *What's new in IE3 — and the questions: see page 34*

Net censorship battle as police ban porn

A showdown on net censorship looked inevitable last month after Scotland Yard's Vice Squad told internet providers to block pornographic groups, or face possible prosecution.

Chief Inspector Stephen French listed an initial 134 banned groups and added in a letter to service providers: "This list is not exhaustive and we are looking to you to monitor your newsgroups, identifying and taking necessary action against those others found to contain such material." UuNet-Pipex has already blocked some newsgroups. But Mailbox Internet chairman Stephen Dyer said this was like telling BT to monitor phone calls.

He said he did not approve of the contents of the named groups but "the police action will merely spread the pornography into other groups with innocuous names."

Ironically, news of the police action came as Microsoft offered a easy way to stop minors accessing porn (see page 34).

A special web site covering the issue has been set up at wwww.censorship.uk.com.

DynaMO drive is Fujitsu's bid for the low-cost storage market

Cheap optical drive

■ Fujitsu has pitched for the burgeoning removable storage market with this 640Mb SCSI magneto-optical (MO) drive costing £299 (plus VAT) for the internal version and £399 for the external. The 640Mb disks cost £40 and the drive will read and write 540Mb and 230Mb MO disks; it will also read 128Mb disks. See page 31 for more news of removable storage, including a new Iomega backup drive offering the lowest price yet per compressed Mb: less than 1p. Iomega 0181 573 4444

Next-generation Psion to be ARMed for voice recognition

Psion is licensing its operating software to other palmtop makers in a bid to establish it as a new standard, in competition with Microsoft's Windows-based Pegasus mobile kernel. Psion has also hinted that the successor to its market-leading Series 3a organiser will be voice-driven.

The company has set up a subsidiary called Psion Software to market EPOC/16, the Series 3 operating system, and its new 32-bit sibling, EPOC/32. The latter has yet to appear in a product but will run Psion's next-generation organiser, which will use either the ARM7100 or StrongARM chips.

It is also likely to be used on products using a new ARM-based Cirrus Logic processor called the CL-PS7110, which claims to offer the highest available processing power per Watt: 15MIPs/W, with a peak consumption of 0.07W.

This compares with the typical 3.7W drawn by Intel's latest low-drain 150MHz Pentium notebook processor. The Cirrus chip is less powerful: equivalent to a 33MHz Intel 486.

EPOC will additionally be used in smart phones and mobile browsers. Psion chairman David Potter said: "One of our strategies is to establish our platform as an open standard...this sector will inevitably attract more players as communication and computing technologies continue to converge."

Psion's other big business move — a projected purchase of Amstrad's computer interests (previously reported in *Newsprint*, September) — fell through, apparently because no price could be agreed. One sticking point was how much the value of the company would be affected by current law suits.

Pegasus, which contains a Win95 kernel, is due to be released in November.

Psion 0171 262 5580

Amstrad PcW faces delay

Seems like hard times at Amstrad. First, the Psion buyout falls through (see above), and then the company admits that the PcW 16, vaunted successor to its famous PcW 8256 word processor, is months late.

Simon Rockman reviewed a prototype way back in February, and judged the software to be in a mess. Amstrad has been promising the machine since January.

Amstrad Direct was transferred to Viglen in March and it was Viglen who held back the launch. Phil Fitzgerald, a "PcW16 Executive," said: "We haven't been able to get the software right."

Some machines are currently out to customers on "gamma tests" and Fitzgerald predicts a mid-September release. Presumably, this year. **Melvyn Mildiner**

The web site said nothing about green potatoes being poisonous.

Web boost for eco-friendly spud

■ Greenvale Produce has set up a web site at www.greenvale.co.uk to promote the production of the environmentally friendly potato.
Greenvale 01354 67731

Short Stories

Active speech

■ These active speakers from Portable Add-ons are powered by a notebook's PS/2 port and require no additional batteries. They also function as a microphone and have a suggested price of £139.
Portable Add-ons 01483 241333

University guide

■ The Push Guide to Which Universities, an irreverent multimedia survey which takes into account factors such as beer prices and flunk rates, is available on CD for £49.

A web version can be seen at www.mcgraw-hill.co.uk/push.
Magraw Hill 01628 23432

■ This organiser has a paltry 12Kb memory but sports an FM radio and costs £30 from Dixons and other High Street chains.

Happy birthday...

to the IBM PC, which was 15 years old on 12th August. It was born with just 16Kb of RAM, a mono monitor and optional casette storage. The first one sold in the UK for £2,080.

...and to

Windows 95, which entered the world officially on 21st August after a difficult pregnancy ended by a birth induced by user and industry pressure.

Hare Krishna virus induces hara-kiri in PCs

Three new virus alerts went out last month. Two (see below) were about a Macro virus affecting Excel spreadsheets. The third, and most immediately serious, was set set to activate on 22 August, shortly after this issue went to press.

The Hare (as in Hare Krishna) virus, primed for 22 September, caused a few red faces as experts said it was spreading via steamier internet news groups. Its effects are nasty, unlike most common viruses.

An outbreak was found in the offices of *PCW* owner VNU in early in August and we deliberately infected a PC and put the clock forward to 22 August. Instead of booting into Windows 95 we got a message saying: *HDEuthanasia v3 by Demon Emperor: Hare Krsna hare, hare, hare*. (Krsna is another spelling of Krishna). The virus got into the master boot record, making the hard disk unreadable. It infects COM and EXE files.

Ian Whalley, editor of *Virus Bulletin* (*see below*), says Hare is the first virus to infect floppy boot sectors under Windows 95. He writes in the August edition of VB that the Hare virus has several bugs and replications do not always execute properly.

The virus slows Win95 noticeably as it puts the PC into 16-bit mode; if your Control Panel System dialog says you are in 32-bit mode you are *not* infected, although a virus is only one possible cause of 16-bit operation.

Clive Akass

S&S 01296 318700

Macro virus spreads to Excel

Two new macro viruses were reported last month: the first Excel virus to replicate successfully; and another, the Wazzu, infects Word and like last year's original Concept macro virus, spreads quickly.

Wazzu does nothing more serious than juggle text about. The Excel virus, called Laroux, does nothing, but is potentially more dangerous, even though only two instances had been reported as we went to press. Like Concept, it can be easily adapted to do damage; and it uses Visual Basic for Applications, which are more powerful than Word Basic, used by Concept. Moreover, Excel files tend to be more critical to businesses than Word documents.

Laroux creates an infected file named PERSONAL.XLS which loads whenever Excel is run, infecting every spreadsheet opened or created.

Microsoft says the following macros are listed under the Tools menu in infected systems: Auto_ Open; Check_files; PERSONAL.XLS! auto_open; PERSONAL.XLS! check_files. All major anti-virus companies have posted fixes, as has Microsoft at www.microsoft.com/MSExcel/productinfo/vbavirus/emvolc.htm. Excel files may not travel as much as Word files but Ian Whalley, editor of *Virus Bulletin*, warned against complacency. "The fact is, we don't know. People may send them more often than we think." Detailed analyses of Laroux and Hare (*see above*) appear in the August *Virus Bulletin*.

Virus Bulletin 01235 555139; www.virusbtn.com

PC-cillin is one of several products to offer Wazzu fixes

Nice touch from Cirque

This is the latest Glidepoint Touchpad from the US company Cirque. It measures 0.95 x 11.7 x 10.2cm and includes three buttons which can be programmed for tasks such as cutting and pasting.

Enhanced software is said to enable smooth and efficient cursor-control even at high tracking speeds.

Lindy (dealer) 01642 765275

Short stories

Chain boss predicts software boom

■ Alan Taylor's joyful leap reflects his optimism. He believes there is going to be a boom in software sales over the coming decade, as all the people now buying computers look for things to do with them.

He is launching a chain of Software City stores selling games, educational and business titles. The first opened last month in Leeds.

Software City 01244 320111

Makers post fix for scanner

■ About 150,000 scanners made by Hewlett-Packard and Visioneer could seize and overheat in the event of a power glitch, the companies say.

Models affected are the ScanJet 4s, made to a Visioneer design by HP, and Visioneer's own PaperPort Vx. ScanJets made after March 15th are not affected.

HP's UK scanner marketing manager, Phil Hall, said problems are very unlikely to occur in Britain, where power supplies are relatively reliable. "Fundamentally, this is a Visioneer problem," he said.

Problems with a total of 38 Scanjets have been reported worldwide, HP says.

Users of either model can download a software fix from www.visioneer.com, where PaperPort users can also order a free glitch protector.

This is available to Scanjet users by calling 0990 474747.

SeNTry duty

■ Serverware has launched version 1.6 of SeNTry, which facilitates problem-spotting and management of NT networks. It costs £149 per server and £49 per workstation. A 30-day evaluation can be downloaded from www.serverware.com.

Short Stories

Touching display

■ Ellinor says an electronic information booth can cost as little as £1,000 with its Camelion touchscreen tower.
Ellinor 01734 311066

Get your signature true to type

■ Bitmapped signatures can get round the problem of how to sign faxes and document files sent directly from PCs, but they are cumbersome and inefficient.

Formula Solutions will convert your signature (or logo) into a Windows TrueType font. Your entire signature can then be represented as a single letter, minimising file size, and can be scaled up and down as necessary.

The new font can be embedded into documents sent to people who do not have it installed. Prices start at £45 for a signature, and £250 for a logo.
Formula Solutions 0181 252 4444

Factotum for Word

■ Most people complain that Microsoft Word is, if anything, top-heavy with features. Not so Online Design, which is about to release version 3.0 of Factotum for Word.

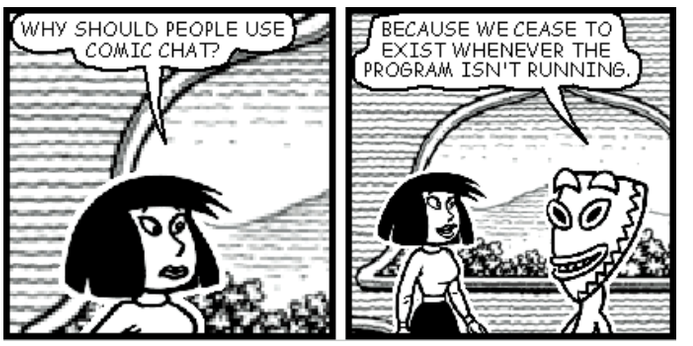
It claims the software helps users manage the content of documents like screenplays, books and manuals.
Online Design 0131 477 8213

Student offer

■ MJN is targeting students with a P120 machine, with 16Mb of RAM, a 1Gb hard disk, quad-speed multimedia and a library of educational CDs, for £968 plus VAT.

Students who buy this month will also get a 14.4Kb/sec modem.
MJN 01282 777 555

Gates snubs Intel to get workstation-class graphics



Microsoft researchers also presented a paper on a system called Comic Chat, which animates online conversations in the form of comic strips. Typed words come out in the form of balloon dialogues attached to characters. You can download a version of Comic Chat from www.micosoft.com.

A new Microsoft technology, codenamed Talisman, casts doubt on Intel's boast that its next-generation multimedia-enhanced (MMX) Pentiums will provide all the graphics processing a PC will need.

Talisman, which is still under development, provides a reference design for a cheap (under £200) add-on card giving workstation-class graphics for PC games in the face of competition from new games machines like the 64-bit Nintendo 64 (*page 112*).

Microsoft says Talisman developers are "working closely with Intel" and that the new technology will work with MMX chips, due to appear later this year. But the Talisman strategy of off-loading graphics-processing to a specialist chip flies in the face of Intel's policy of putting all the work onto a central processor.

Nevertheless, the two technologies will work together to "deliver exciting performance," says a Microsoft statement.

Talisman will run programs written to DirectX, a set of multimedia functions, including 2D and 3D graphics, for use by developers of games and other software.

A Microsoft paper (www.microsoft.com/devdes/talisman.htm) says multimedia graphics performance should not be judged by the standards of expensive computer-aided design (CAD) cards, for which speed is less important than image precision. The reverse is true of multimedia systems using graphics as a medium rather than a tool.

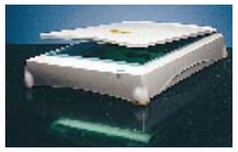
Talisman eschews the traditional frame buffer, storing a bitmap of the screen to be displayed. Instead, it builds an image from a set of stored objects, which can be manipulated independently. Talisman also offers MPEG-2, videoconferencing, sound, and modem facilities. Several manufacturers are said to be interested in making Talisman chips and boards. **Clive Akass**

Optical notebook

Panasonic has launched what it says is the first notebook to include a PD drive, which doubles as a quad-speed CD player and 650Mb optical read-write drive. The CF-62 comes in 133MHz and 100MHz versions with a 12.1in TFT colour screen,16-bit sound and built-in speakers. Prices start at £4,799.
Panasonic 0500 404041. Tadpole 012234 28200

■ Tadpole has announced price reductions of up to 20 percent on its SPARCbook 3GX workstation-class notebooks. A typical configuration with 32Mb of RAM now costs £10,000.

Short stories



£199 flatbed

■ Watford Electronics is charging just £199 for this 24-bit colour flatbed which it claims can scan at up to 4800dpi.
Watford 01582 745584

Local search

■ Mistral will be offering a UK-specific search engine, which eliminates irrelevant non-local sites, at the Internet 96 show on October 2nd-4th. The free service will be available at www.uk.search.com
Mistral 01273 747432

Sidekick pack

■ Starfish Software has released a deluxe CD-based version of Sidekick 95 which includes 32-bit versions of the Sidekick organiser and Dashboard launcher.
Starfish 0181 875 4455

DIY video editing

■ Multimedia Direct is selling PCs with video-editing equipment installed and optimised. Prices start at £3,799 plus VAT for a 133MHz Pentium, 32Mb of RAM, Adobe Premiere, and the miroVideo DC20.

A 150MHz system built around the Fast AV Master costs £4,159 plus VAT.
Multimedia Direct 01635 873000

Seeing i2i

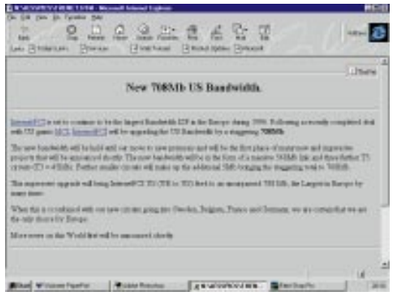
■ IMS is offering the i2I Cruiser videoconferencing system for £1,195 plus VAT. The system is said to allow conferencing at up to 30 frames per second on a standard ISDN2 line.
IMS 0161 678 6159

Provider accused of shooting a line over 708Mbit link to US

Special report by Jessica Hodgson

An Internet provider's claims of mega-connectivity have been ridiculed by major industry players. Brighton-based Frontier Communications Ltd also appears to be trading under the name Inter-netFCI Connect. It is being investigated by local trading standards officers, but they declined to give details.

It claimed on its web pages (www.thenet.co.uk) and on press releases to have 100 percent UK local coverage on an 0645 number, 73 points of presence,



more than 80Mbits UK bandwidth and a new deal providing 708Mbits dedicated bandwidth to the US (*see screenshot*).

A spokesman for the Internet Service Providers' Association said: "these people must have very deep pockets to have invested in dedicated transatlantic bandwidth, and we have no knowledge of this company having made this level of investment."

James Gardiner, marketing manager for Demon Internet, said: "they claim they have 80Mbits. Is that 80Mbits per second? per hour? per month? per year? We've got 45Mbits per second to the US and that's costing us £5 million per year."

Frontier managing director, Eden Akhavi, said: "we had someone maintain our web site over the last few months and I didn't oversee the web pages." He claimed some staff had left under bad circumstances and he was not responsible for claims made. Mr Akhavi declined to answer a set of faxed questions from *PCW*.

Frontier was ordered to pay £109 plus £160.87 costs to engineer Simon Rixon by Brighton County Court earlier this year. Rixon subscribed to its service for about two months, and complained that for four out of five weeks he was unable to send or receive email, or get external web pages. The company twice failed to attend the court hearing. Robert Anderson, another subscriber, faxed a letter of complaint to the company detailing "constant problems accessing your service. I rarely seem to able to log in (to email) without trying many times...Sometimes the system works perfectly, at others it does not function at all."

Frontier initially leased a 64Kbit line from Pipex, but the deal was cancelled due to payment arrears. Subsequently, it leased two lines from Mercury, who would make no comment. Mercury provides bandwidth through the US giant MCI, which has a total transatlantic bandwidth of 612Mbits/sec.

Frontier's web pages claimed "following a recently completed deal with US giants MCI, InternetFCI will be upgrading the US Bandwidth by a staggering 708Mb." MCI's Alan Garrett said: "at the moment, we do not offer 708Mbits to any country, let alone any individual company."

Olivetti thinks small on cases

Olivetti is launching a new Xana range of PCs which the company claims have a footprint 10 percent smaller than standard models.

There are desktop and mini-tower options, with processors ranging from 120MHz to 200MHz Pentiums.

The stylish cabinet was designed by the de Lucchi studio in Milan with the idea of blending with home environments. Prices start at £1,299
Olivetti 0181 785 6666

Iomega cuts backup costs to less than 1p per Mb

Iomega, fresh from the success of its Zip superfloppy drive (see where), forcing the pace in the tape backup market with a device that brings storage costs down to less than 1p per (compressed) megabyte.

The new Ditto 2Gb is a snub for 3M, the tape maker that is a prime mover for Qic and Travan tapes because it uses a new and much cheaper format, bringing the cost of a 1Gb (uncompressed) tape to £15.

Prices of Iomega's DittoEasy tape drives are down to £80 but their 400Mb tapes cost around £26 each. "That means you pay almost as much for three tapes as you paid for the drive," said Iomega's UK mouthpiece David Cunliffe.

The external Ditto 2Gb (*above*), like the Easy, is modelled on the highly successful Zip drive. It costs £175 including VAT and a tape, and connects by enhanced parallel port. An internal version (*below*) can be daisy-chained to a floppy. It costs £125.

These prices are likely to fall if previous Iomega products are anything to go by. The idea of the new drive is to allow users to back up the typical 1Gb to 1.5Gb hard disks on today's entry level machines.

The drives come with enhanced backup software, which allows the tape for the first time to be treated like a disk drive.

Caroline Oest, product manager for Iomega Europe, said the 3M-dominated price structure for tapes did not cater for mass-market mass storage. She believed the new tapes would force the company to rethink its prices.

The new tapes will be made by Sony as well as Iomega.
Iomega 0800 898563

An heir to the floppy drive "has yet to appear"

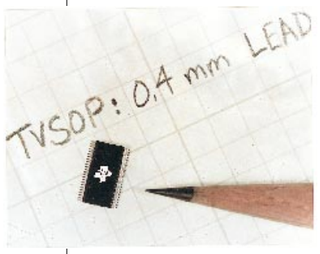
Neither of the two superfloppy front runners is certain to be the successor to the 1.44Mb floppy, according to Dataquest.

Phil Devin, chief analyst for storage in the US, said Iomega's Zip had created the biggest buzz of any storage product since the audio CD. It is now being challenged by Compaq's LS-120 drive (*right*), which reads 120Mb disks as well as standard 1.44Mb floppies but is slower.

The LS-120 makes its UK debut this month on some models of Compaq's new Deskpro range (*page 34*) and will become more generally available when production is ramped up. But Devin said, after the publication of a Dataquest report on removable storage, that the long-term winner in the race to replace the floppy drive "is more likely to be a low-cost, high-capacity optical solution that has not yet appeared on the scene."

■ Xyratex has reduced the price of its MaxIT cartridge drive to £299, making it more competitive with Iomega's 1Gb Jaz and Syquest's 1.3Gb Syjet. Its 540Mb cartridges cost £45, which Xyratex claims is the lowest cost per Mb.
Xyratex 01705 486363; Syquest 0800 526559; Iomega 0800 898563

Short stories



Texas chips

■ System boards could get smaller with a new family of chip packages developed by Texas Instruments. The new thin design, for portables and PC cards, are said to occupy up to 60 percent less space.

Plug-in disk

■ Notebook users needing more hard disk space than is available on plug-in cards may be interested in Opti's new Diskman drives, which use the PC card slot simply as a connection point. The 810Mb Diskman costs £328 (plus VAT) and the 1.39Gb model is £429.
Opti 0181 507 1818

Serial talks

■ The Adam-4540 allows a standard PC serial port to communicate over a fibre-optic link.
Fairchild 01703 211789

NT defragmenter

■ Executive Software has posted beta versions of its disk defragmenter Diskeeper 2.0 for Windows NT 4.0. The address is www.execsoft.co.uk

Sterling netted

■ Sage has launched network version 3.2 of Sterling for Windows, allowing greater integration of accounts in different departments. This also allows marketing staff to use information from sales more easily.

The new version is ODBC-compliant and compatible with Novell and NT. It costs £1,250 for an unlimited number of users
Sage 0191 255 3000

Questions remain as IE3 out-hypes NT 4.0

A measure of Microsoft's focus on the web was that its giveaway Internet Explorer 3.0 got a bigger launch than the new Windows NT 4.0, which should be available in Britain this month.

Two big questions remain about Microsoft's web strategy. One was raised by Netscape, in a letter to anti-Trust officials. It accused Microsoft of trying to force users to buy the more expensive server version of NT, by limiting the workstation version to ten simultaneous web connections.

The other question concerns ActiveX, a web extension of OLE technology, allowing software modules to work together. This currently works only with Windows but Mac and Unix versions are promised for this year.

ActiveX is independent of programming language and can contain Java apps, but is not hardware-neutral like Java. It will not run on a network computer. Microsoft officials answer by saying the NC will not take off, but this ignores massive investment in set-top boxes alone; these are expected to bring the web into living rooms.

Microsoft is giving away ActiveX to an independent standards body. UK net marketing manager Jeremy Gittings said: "It will be up to that body to decide the future of Active X."

Clive Akass

Share your PC courtesy of AST

AST has launched Centralan, a PC which up to 12 users can share via dumb terminals. Each has a monitor, mouse and keyboard, connected via a proprietary box.

The system is described as a hybrid between a PC network and a network computer. The PC uses a single Pentium and one Fast/Wide SCSI-2 hard disk. AST has licenced a 32-bit DOS layer to deal with the networking, and Windows 3.11 sits on top. The DOS layer will only support a 16-bit operating system and applications.

By using one PC, you save on the initial price and minimise the cost and

inconvenience of upgrading. AST is selling a basic configuration of one server for four users for £3999. Equipment for the four users costs £195. The first extra user costs £499, plus the cost of a monitor; each three following users cost £119 plus the cost of a monitor. All prices exclude VAT.

Adele Dyer

Short stories

New IE3 includes a smut filter

Three new features of IE3 (see page 24) are likely to prove winners. One is support for RASC parental guidance ratings on sites with provision for restricting children's access.

The second is support for a referral server holding details of service providers. New users can thus sign up virtually at the click of a button, without configuration hassles.

An add-on called NetMeeting uses the T120 standard to allow users to talk and work together on shared files, although how useful it will be on a standard web connection is unclear. Java and the latest HTML extensions open up web page design. Usability improvements include:

- A configurable toolbar, allowing you to attach favourite addresses to buttons.
- Integrated search facilities, including Yahoo searches direct from the address bar.

Siemens Nixdorf has introduced the Scenicrange of multimedia notebooks, with CD-ROM drive options and a 12.1in TFT colour screen. Prices start at £2,2234 for the Scenic Mobile 500.
Siemens Nixdorf 01344 862222

Escom users are offered support ... at a price

Thousands of former Escom customers were left without technical support after receivers Deloitte and Touche deemed warranties to be invalid.

PCW reader Ian Roberts found himself locked out from his own Pentium PC after he went to pick it up from Escom's Harrogate branch after a repair. He located it in Leeds and was told he would have to wait two or three days before getting it back, unrepaired. He said: "They used a cheap removal firm … the machines could easily have been damaged."

The Escom closure, just a year after it took over former Rumbelows high-street stores, prompted a bitter reaction from the Personal Computer Association. Chairman Keith Warburton said Escom damaged the marketplace by misleading users into believing they could get a PC for below market price. "If the price you're paying is lower than the rest of the market place, then you're sacrificing product quality and product support."

Computacare and ICL are charging £50 for a 12 month warranty and Silica is offering a trade-in deal. The Diamond Group is launching a "rescue pack" for £80 a year plus an inspection fee of £20. Panther is offering ongoing support at £7 per month.

Tim Bajarin reports from the US

■ Full agreement on the copyright issues delaying DVD, the next generation CD, could take weeks or even months. DVD can hold 18.4Gb, enough for three 120 minute MPEG2 movies, and is CD-compatible.

The PC industry does not want copy protection but the movie and music industries fear that digital-standard piracy will be rampant without it. The three groups have fought bitterly, but recently accepted a digital-to-digital copy protection method proposed by Matsushita. This is believed to contain two approaches, one involving content-scrambling and the other bus authentication and encryption. But the DVD organisation's technical working group will take some time to evaluate the proposals fully.

PC vendors are eyeing what is being called a Trojan Horse strategy of attracting a new class of buyer by selling computers primarily as DVD playback machines, which can also play CDs and connect to the internet.

■ There has been a lot of activity integrating phone and computing technology. Alain Rossman, co-founder of the ill-fated wireless mobile pioneer EO, has come up with a compact operating system to allow smart phones to deliver email, pages and faxes.

He now heads a company called Unwired Planet, and showed me a japanese prototype smart phone using his software, partly derived from EO technology.

Geoworks is also working on smart phone software, and Phoenix is writing BIOS level code. Intel, AMD and National Semiconductor are all working on high-integration silicon to put the x86 architecture into smart phones.

■ Intel's bid to push everyone into buying multimedia-enhanced (MMX) chips suggests that their prices will go up rather than down as in the past. This will leave a hole at the bottom end of the market for Cyrix's 5x86G, which performs like a 120MHz Pentium but fits in a 486 slot and costs less than $100.

IBM Aptiva home PCs are first to have new USB port

Ninety per cent of people know that IBM makes computers but 70 percent think that IBM doesn't make computers for them, according to IBM UK's new head Mike Lunch. In other words, IBM has a problem selling to the home market. But a new UK consumer division headed by Larry Smith is designed to increase market share for the Aptiva brand.

The USB port, seen on the new Aptivas, will eventually replace the serial and parallel ports

A whole new range of Aptivas has been launched along with price cuts and a retail deal with a leading high street TV rental chain. "The consumer market is too big to just play with any more and IBM's prices are now competitive" said Smith. The Aptiva range will now offer a minimum 12Mb RAM and Windows 95, with no OS/2 option.

Smith explained: "Most of the products for the consumer are being written for Windows 95."

Other bundled software includes an Internet Connect Phone kit, a Rapid Resume which opens the PC into its switch-off state, and a module to help users install new software. IBM is also one of the first manufacturers to bring new Universal Serial Bus to the home market with all new Aptivas featuring a USB port.

IBM is claiming "arcade quality" graphics on the more expensive Aptivas by using the new ATI 3D Rage graphics chipset on the 382 and 392. MPEG support is also available.

Prices start at £1399 for the 120MHz 12Mb/850Mb Aptiva 351 to £2749 for the 200MHz top line Aptiva 392.

www.europe.ibm.com

Compaq offers cheap option for corporates

Compaq has formally launched its revamped company desktop range, with the entry-level Deskpro 2000 coming in at just £800. This excludes VAT and a monitor,

Deskpro 4000.... designed for corporate networks

but as Dylan Armbrust pointed out in his *First Impressions* review (PCW, September): it is still cheap by corporate standards.

The new Deskpros will replace existing Prolinea and Deskpro systems, which will be phased out in the coming months. They fall into three groups (all prices exclude monitors): The Deskpro 6000 series is aimed at power users and is optimised for Windows NT. Prices range up to £3,890 for a 200MHz Pentium Pro with 32Mb of RAM, a 4.2Gb disk, and a combined CD player and PD read-write drive.

The Deskpro 4000 series is designed for corporate networks and starts at £1,315 for a 120MHz Pentium model. Options include the LS-120 120Mb drive (*see page 31*). The 4000 and 6000 models all include ethernet and infra-red ports.

The Deskpro 2000 series is targeted at small businesses or those larger companies seeking cheaper models. Compaq may also have an eye on heading off competition from low-cost network computers.

All models include technology that Compaq claims helps keep down the cost of ownership. Ironically, some arguments it uses could equally justify the NC.

Steve Jackson, senior UK product manager, said Compaq had not ruled out producing a network computer. "We are not yet convinced there will be a demand."

Compaq 0181 332 3000

Apple sounds a high note as System 8 is put on drip feed

It seems Apple Computer will end 1996 on a higher note than it started it. Against a background of slightly increased sales, and confident noises from CEO Gilbert Amelio, the company unveiled a new range of home PCs for the Christmas market. Still using the Performa brand, they are separated into Family, Home Office and Creative Studio ranges.

The new range is targeted at home and SoHo users and sees the first all-black Performa in the UK, designed to blend more easily with home furnishings. Other innovations include built-in sub woofers inside the PC casing and surround-sound emulation designed to enhance gameplay.

"We are launching solutions with distinctly superior user value not just products," said Apple UK's Alan Hely at the launch. The company also said that it will soon ship its 25 millionth Mac.

However, Apple still has problems. Some industry watchers, while accepting recent improvements, still believe the company is in long-term decline. The much-delayed System 8 upgrade will now be delivered as Incremental Open Doc components for installation onto existing machines.

Apple said that it cannot finish the entire OS in time for an early 1997 release and some of the more advanced features may not now see the light of day. The company gave no clues to pricing or how the code will be delivered to its customers. Apple is also rumoured to be licensing NT 4.0 from Microsoft for future shipment in Power PC Macs as Microsoft's multi-user OS gains wider industry acceptance.

Prices for the new Performas start at £1449 excluding VAT with 160MHz PowerPC.

Paul Fisher

Apple 0800 127753; www.euro.apple.com/uk

TOP TEN DOS SOFTWARE

			(last month)
1	System Commander	POW	-
2	Flight Simulator v5.1	Microsoft	2
3	Flight Sim. NY/Paris	Microsoft	4
4	MS DOS v.6.22	Microsoft	1
5	Formula 1 Grand Prix 2	Pinnacle	-
6	Turbo C++ v.3.0	Borland	8
7	Duke Nukem 3D	US Gold	3
8	Procomm for DOS	DataStorm	-
9	Worms	Ocean	-
10	DOS to Windows 95 U/G	Microsoft	5

TOP TEN CD-ROMS

1	Organic Art	Warners
2	The Unexplained	Flag Tower
3	Bodyworks 5	Softkey
4	Cinemania 96	Microsoft
5	Encarta 96 Encyclopedia	Microsoft
6	Autoroute Express: UK & IRE	Microsoft
7	Star Wars Trilogy	Acclaim
8	Print Artist	Sierra
9	Ultimate Enc. of Soccer	Electronic Arts
10	Windows 95	Microsoft

Chart courtesy of HMV Games/LEVEL ONE

Stories pile insult on to Mac-injury

Apple faced more indignity last month as it sought to keep a bright outlook in the face of the gloom-mongers.

US media reported that a team of top Microsoft programmers were ensconsed in a secret hideout churning out Mac code to keep the company alive.

It seemed that Gates believed he needed to keep Apple afloat in order to stave off anti-monopoly actions. Indeed, a big fear at Apple is that developers will lose faith in the future of the Mac and switch their efforts to producing Windows software.

However, the story was ridiculed by Microsoft's UK internet director Andrew Lees, who said that the programmers involved were simply developing the Mac version of IE3.

Newsprint welcomes feedback. Fax your news and views to 0171 316 9317, or email clivea@vnu.co.uk. Or post them to the PCW forum at www.pcw.vnu.co.uk

TOP TEN WINDOWS SOFTWARE

			(last month)
1	MS Windows to Windows 95 U/G	Microsoft	1
2	WordPerfect Suite for Windows 95	Corel	-
3	Encarta 96	Microsoft	3
4	Uninstaller v3.5	RMG	6
5	First Aid for Windows 95	RMG	4
6	WordPerfect Suite for Windows 3.x	Corel	2
7	MS Office 4.2	Microsoft	10
8	Hurricane RAM Doubler	RMG	5
9	Partition Magic	POW	-
10	Macafee VirusSCAN 3.1	Mcafee	-

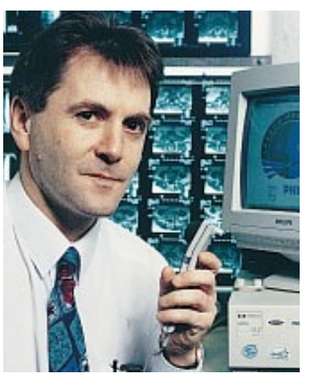
Figures for DOS software and Windows software supplied by the Software Warehouse

A smooth-talking buy

The only commercial system to recognise unbroken speech is now available as a standalone box for specialist uses. The SP66000s costs about £12,000 or can be leased from Philips Natural Speech Processing, (formerly Philips Dictation Systems).

Available later this year will be SpeechPad, a pocket dictation system. PNSP does not expect the system to fit into general-purpose computers.

PNSP 01206 755755



ARMed and ready

Keen as it is to establish an industry standard, Psion does not want to lose sight of innovation. Alex Singleton reports.

Psion's creation of a subsidiary to licence its technology is a bid to establish its compact operating software as a standard for mobiles in much the same way Microsoft did with MSDOS on the PC. The news broke as details emerged about Pegasus, Microsoft's own bid for the mobile market (see *Tim Bajarin*, opposite).

At the same time, the normally secretive Psion has been letting slip hints about successors to its world-beating Series 3a organiser. Future Psion products will be based around RISC processors from the Cambridge company ARM: most probably the ARM7100 or StrongARM models. The latter, the result of a collaboration with Digital, has enough power to cope with speech recognition and can run using just two AA batteries.

The Psion 3a is already ahead in mobile email facilities

Indeed, Psion UK's managing director, Peter Norman, told me that the company is working hard at incorporating speech recognition into future Psion palmtops, although this will not become actuality until the technology works 100 percent of the time. "We wouldn't want to get into the position that handwriting recognition got into, which was that it didn't always work. Because of this, the Newton hasn't been a commercial success," he said.

Norman says new products from Psion take around three years to establish themselves and he does not expect an ARM-based Psion to sell in significant numbers until the year 2000. This would seem to suggest that we might see an ARM-based Psion in the shops next year, and this tallies with the fact that Psion has stated that a successor to the 3a will be launched in 1997.

Psion will score over the likes of Nokia (which has entered the PDA market with the 9000 communicator, a combined organiser and GSM cellphone) by being compatible with what business people run on their desktop machines and networks. Psion's email engine, PsiMail, enables 3a users to download office email via a ccMail or MS Mail gateway and a mobile phone. Remarkably, files attached to messages are converted on the fly into Psion-readable formats.

Furthermore, Psion is working on Oracle compatibility to allow an organiser to access databases reliably and efficiently across a mobile phone or modem link. This is not as easy as it sounds, because mobile transmissions are limited in bandwidth and unreliable compared with wide area network cabling.

Another concession to PC standards is Psion's Oval programming language, which is Visual Basic compatible to help companies develop in-house software for both desktop and handheld machines. Norman claims that code written in Oval is "not particularly inefficient" and the runtime for it takes up around 300Kb on ROM.

Alan Sugar's bid to sell Amstrad to Psion (Newsprint, *PCW* September) failed because a price agreement could not be reached. The deal would have provided Psion with GSM phone technology from Amstrad's Betacom subsidiary and eliminated competition with Amstrad's own pocket computers.

But this is not to say that Psion needed the deal. It has comms expertise in the form of its Dacom subsidiary, and Amstrad's PDAs are less than successful. Norman said that despite not having purchased Amstrad, Psion remains "committed to using GSM technology in our products."

However, Psion is not planning to wage war on Nokia's 9000. "In combining GSM technology and our palmtops, we are not going to throw away some of the minimum standards, such as battery life and weight, that are needed to make a product viable," he said. And there is some truth in this: a PDA which is uncomfortably heavy is useless because no-one is going to want to carry it around.

Psion Software, the new subsidiary that will be licensing Psion products, is claimed to already have companies lining up to become licensees. Digital has been revealed as one. Acorn, which has been selling re-badged Psion computers for several years, will licence an ARM-based PDA if Xemplar, its joint educational venture with Apple, agrees to sell them. (Oddly, while Acorn's re-badging of Psion Organisers for school work is claimed to have been a financial success, its major traditional competitor, Research Machines, has yet to provide anything similar.)

Oracle could be interested as it originally wanted its Network Computer to be based around the ARM-powered Apple Newton. With Acorn (which produces Oracle's NC OS) as a firm supporter of Psion products, there is a strong case for this. Clearly, Psion Software sees the importance of being at the forefront of portable NCs, which is why it has made available the core of a mobile web browser.

Psion's turnover increased by 48 percent last year and is anticipated to rise again this year. With the economies of scale that will be gained though its licensing, its future as both a standard-setter and innovator appear to be assured. ■

Data on the wing

As Microsoft begins to develop 'Pegasus', a true handheld desktop companion, Tim Bajarin highlights the dilemma now facing Apple.

In late 1992 I sat down with John Sculley, then head of Apple, to discuss a pet project he and a small band of hand-picked engineers had been working on for four years. It was called a Personal Digital Assistant, and they believed it could revolutionise computing.

A different group of Apple engineers, under Steve Jobs, had gone through a similar exercise almost a decade earlier and come up with the Mac, so I think Sculley believed that in the PDA, which was eventually launched as the Newton, he would be bestowing a similar legacy. I remember our discussion distinctly because the idea of a handheld device that used handwriting recognition was not only fascinating, but plausible, too.

I figured that a device like this would make a great digital companion to my PC, allowing me to have, as the British call it, "take-away" data. But Sculley's PDA obliged users to adapt to a completely new operating system, a new user interface and, in many ways, a non-Mac file structure. I had secretly been hoping for something that I was calling a Mac companion: a mini-version of a Mac; not a Powerbook, but a handheld that could handle files and information from my Macintosh.

I told John Sculley and his team at the time that I was concerned about the Newton's chances if it were aimed at the consumer market, rather than the business user. Of course, the original Newton was way off its mark: the latest models are more powerful and have better handwriting recognition, but their greatest promise lies in specialist, not mainstream, markets.

Pegasus: likely to coin it in for Microsoft

Around the time the Newton hit the market, Microsoft and Compaq began developing something they were calling WinPad, which was something like what I thought Apple should do with Newton. It was going to be a handheld that worked just like a desktop Windows system. But when Newton got poor reviews, the WinPad project was shelved.

Now, Microsoft has dusted off the WinPad project and has begun creating a true handheld desktop companion, codenamed Pegasus. Sources say it looks something like the HP LX 200 but a bit bigger, and has the Win95 interface and Win95 mobile extensions.

You will be able to copy schedules, addresses, contact information and even actual data files quickly and painlessly from the desktop to Pegasus and take them with you. It will probably also have at least one PC Card slot so you could even use it for land line or wireless email access. Although under Sculley's original definition we could classify this device as a PDA, I see it more as a mobile companion to my desktop. On the one hand, the traditional consumer will have no interest in this device, but on the other, you can imagine that it will appeal to tens of millions of Windows 95 users.

Pegasus provides Apple with an dilemma: the Newton will download files from your desktop if necessary, but with no keyboard and an appreciable learning curve it is not an ideal mobile companion. So, as I told Sculley, I need a Mac Companion using the Mac interface and actual Mac file formats. I want to have an easy way in which to synchronise data and copy exact files to my Mac companion. Is this too much to ask?

It probably means keeping Newton for the vertical and perhaps, eventually, the consumer markets and creating a new take-away Mac for the millions of die-hard Mac users who are attracted by the Pegasus concept.

I use both Windows and Macs, so I'm sure I will embrace Pegasus when it comes out. But as I use the Mac most of all, I really want Apple to oblige me by creating a Mac Companion. ■

TV times…

It seems that Microsoft is going to get into the TV business via a highly secret specification called the broadcast PC (BPC). Gateway launched a Pentium-based PCTV called the Destination, in March, with a 31in Mitsubishi screen and costing around $4,000. BPC specifies a similar system that will cost less than $3,000. Apparently, Microsoft believes that this is the most practical way to get the PC into living-rooms, at least for now. I reckon the Destination's monitor costs Gateway at least $1,000, and similar displays retail at up to $3,500 on the open market. But Microsoft appears undeterred by these prices, and the BPC specification is supposed to be in vendors' hands by the autumn in the hope of having Destination competitors on the market by Christmas next year.

p40 ➢

Blue heaven

After years of revenue decline in the PC market, IBM is making a comeback. Ben Tisdall reports on the background to its new, restructured approach.

At IBM, they're celebrating. IBM invented the IBM PC which briefly gave it 100 percent of the market, but it's been losing market share virtually ever since, culminating in losing its first place to Compaq in 1994. Until the end of '95, IBM's PC business remained in revenue decline — not a healthy situation in a market growing as fast as the PC industry. This year, however, IBM has reversed the trend.

According to Dataquest figures in the second quarter, its worldwide market share grew from 7.7 percent to 8.8 percent, while Compaq's market share actually declined from 10.4 percent a year ago to 9.7 percent in the same period. This narrows the gap between IBM and Compaq to less than one percent. Look at first-quarter growth and the picture for IBM looks even healthier. IBM's growth was 33.6 percent worldwide compared with just 8.5 percent for Compaq.

Lunch: "Major re-engineering initiatives" explain the improvement

Mike Lunch, IBM's enthusiastic UK PC managing director, who's just returned to the fold after a five-year spell at Toshiba, says that "major re-engineering initiatives" explain the improvement. Or, in plainer English, a big effort to dramatically improve competitiveness and customer satisfaction and to reduce inventories of finished PCs. Dataquest analyst, Kimball Brown, said of the inventory issue: "IBM is obviously catching on to this. This stuff is like fruit. It rots."

The first decision was to completely refresh the product line from top to bottom. IBM has just announced a new range of consumer PCs (see *Newsprint*). The second was to cut the number of different models available. IBM discovered that 80 or 85 percent of sales were coming out of 15 or 20 percent of its models. IBM's Thinkpad 701 Butterfly notebook was available in seven different configurations. Its replacement, the 560, comes in just three different models: a dual-scan model and two TFT models with P120 and P133s respectively.

IBM is focusing on getting products out quicker. In the past, it was so obsessed with adding value to products that they were often last to market. As Mike Lunch explained, "If IBM value-add meant being late to market, there was no point." IBM claims it was first to ship a Pentium Pro PC and intends to be early with 200MHz Pentiums and with USB (Universal Serial Bus), by including two such ports in the soon-to-launch PC 3000.

Another change is to get dealers more involved in the configuration of PCs. It's all about time to market, because when IBM built PCs to order for its dealers, the fastest turnaround time it could manage was five days. Big clients often want PCs in a matter of hours, so it's more efficient and cheaper to hold and supply PC carcasses rather than complete PCs. It also gives IBM an edge over direct build-to-order vendors like Dell. IBM has decided to sell only through dealers, as the previous policy of selling some machines direct alienated some of them.

When Louis Gerstner took over as CEO in 1994, he reversed the previous move towards breaking up IBM into smaller component companies. He's gone one step further by instituting a "do it once" policy designed to cut out duplication where possible. This means the same terms and conditions, marketing and so on worldwide. Where once IBM had different brochures, prices and even products for each market, it now has one universal brochure "published" as a multilingual Notes database and accessible to IBM's salesmen and dealers. Paper versions can still be generated from the Notes application and IBM is working to make the same data available to users on the web using Internotes Publisher.

And IBM is looking at price. The company tended to lose out to Compaq and Dell for desktops and to Toshiba for notebooks because it historically charged a price premium. It now says that it bases its pricing on what Compaq and Toshiba are charging. Although its new consumer PCs still look pricey, this policy has paid dividends with corporates. Mike Lunch tells a great anecdote about Bob Stevenson, worldwide head of the PC company. In a UK sales meeting Bob asked who Dell's biggest UK customer was. It turned out Bob knew a former IBMer on the board of that company. Bob picked up the phone, and not only managed to get through to the guy but promised to undercut Dell's best price on desktop PCs. Within days, the story had shot around the company.

Since then, IBM has been bringing home the bacon with the big corporates, winning a decent chunk of BT's business and triumphing at London Underground, General Accident and BOC. IBM's restructured approach to sales has probably helped. In the past, the salesmen responsible for IBM's mission-critical mainframe business had no incentive to sell PCs into companies. PC sales were handled by a completely different group of salesmen. Apart from helping IBM into big accounts, the new approach has led to a reduction in headcount, in the UK PC business, from 360 to 155.

IBM's share price has been rising in recent months and Lunch puts much of that down to the rejuvenated PC business. "It can't just be bullshit," he says, "because we've got the results." ■

Sounding Off

What do Clint Eastwood, Claudia Schiffer and Pamela Anderson have in common? Yes, they're all contributing factors in a "Disk Full" message.

Michael Hewitt

Imagine you're acquainted with Parkinson's Law. A piece of work will expand or contract in order to fill the time that's been allotted to complete it. I've now concluded that computer data follows a similar dictum. If, after years of getting by using a PC with a 40Mb hard disk, you trade up to one with a whole gigabyte, before six months are out, you'll have filled it.

The thing is, it never appears to just gradually fill up, does it? When saturation point occurs, the resulting "Disk Full" message tends to come as a complete my-grandmother-is-pregnant shock. How far it all is from those days of innocence in 1984 when I bought my first proper computer, a twin-floppy Apricot. Back then, I could get the operating system and WordStar on a single 256Kb disk. There was even room — not much, but room all the same — for a few files. Mostly, I saved my documents to a disk in the second drive. I had a box of ten. I can't honestly remember, for all the time I owned that computer, ever needing to buy a second box. Then hard disks, colour screens, and Windows happened.

Just over ten years ago, a 20Mb hard disk was something to aspire to. Those who had them would smugly announce it at cocktail parties, along with the fact that they'd got tickets for Phantom of the Opera and their home had increased in value by 150 percent. "Lucky bastards," people muttered under their breath. "They'll never fill that. They're set for life." Which they were, if a bus ran them over some time in the following six months. Otherwise, their burgeoning data started seeking *lebensraum* within the year.

I seem to remember that the next evolutionary step — the 40Mb disk as standard, even at Dixons — came around 1989. The following year, capacity roughly doubled to 100. But thereafter, things just started getting silly. Today, if you ask for a PC with less than a gigabyte, they'll offer you counselling. Rumour has it that around the corner, the 5Gb drive lurks, and I'll bet we'll still manage to find stuff to fill them.

You can't just blame the applications, as many do. Yes, Windows, Word and Excel are big, but they're not that big. My last PC, the piece of crap that died on me the other week, came to me as a comparative virgin. The only thing to besmirch the honour of its 540Mb disk was the operating system. Even when I added Windows and the usual, I still had a respectable 300 Mb remaining. That is, until a month or so before its demise, when my first "Disk Full" messages began to appear.

It's a variation on the wire coathanger joke, isn't it? You start out with just a couple of files, and the next thing you know, you're inundated with the damn things.

So where the hell did all the additional data come from? Yes, I've been kept fairly busy writing features for assorted newspapers and magazines, and even a book, over the past year. But if I'd been so prolific as to be able to produce 300Mb worth of work, even at the wordage rates that some of the magazines I write for pay, I'd own a villa in Antibes by now. So, the explanation?

It's quite straightforward, I think. If you own a sophisticated computer with multimedia capabilities and all the usual nonsense, you get this compelling urge to use all its facilities; to have it perform to the full. It's like when you own a programmable musical doorbell. There's no logical reason at all to have it play God Save the Queen on Monday and Greensleeves every alternate Wednesday. You do it because you can.

There's nothing in my PC's manual to suggest that it's a good idea to have a .WAV file of Clint Eastwood saying "Go ahead — make my day" whenever Windows starts up. Or to display a large colour picture of Claudia Schiffer as my Windows wallpaper. Or to have an .AVI moving image of a tap dancer appear in a corner of the screen when I run WinZip. I do it because I can and it looks good.

Over the months, I've been downloading files — .WAV, .AVI, .GIF, .BMP, .ETC — from the internet, from CIX, from computer magazine cover CDs, and anywhere else I could find them. Not with any malice of forethought, but just because they were available and grabbed my interest at the time. Some I use on a daily basis. Others I've just forgotten about and left there, like the biorhythm program I got hold of the other month and the .TIF of a pre-silicon Pamela Anderson. Little wonder, then, that the surface of my hard disk came to resemble a Benidorm beach in August. And I imagine if your disk is getting full, it will be digital detritus like this that is mostly to blame.

With this in mind, the second thing on my shopping list, after a new PC, will be a wheat/chaff identification program, akin to a virus checker. Something that will pop up periodically and say "Marina Sirtis [Star Trek] isn't that good-looking, you know. Shall I delete that .GIF you downloaded of her from CompuServe last month (Y/N?)" Or maybe I'll just buy a machine with a much bigger hard disk, as always. ■

Tim Nott

Homefront

What do you get if you cross a Frenchman, a computer and some plastic-tipped darts? Wait for it — here's the punchline...

Different countries have different attitudes to public safety. Here in France, for example, public firework displays start with a procession, led by a marching band. Men and women in flameproof overalls, with big wooden boxes of assorted pyrotechnic devices slung from their shoulders and a permanent fag-in-gob, mingle with the crowd, letting off medium-sized fireworks en route. The public obligingly step round them, everyone behaves sensibly, and no-one gets hurt. It's not until the site of the main weapons-grade display is reached that any barriers or crowd control are in evidence.

In the UK, this would be unthinkable; the public are never trusted to behave sensibly and the combined majesty of the local council, fire brigade and police would have the crowd dispersed in minutes and the perpetrators locked up. Here, of course, it's the council and fire officers themselves who are letting the things off in such a cavalier fashion.

In other public-safety respects, we Brits are far more trustworthy in hazardous situations. We have fewer road accidents. We stop at pedestrian crossings, sometimes even when no police are looking. And we have a long-engrained cultural tradition of being able to hurl sharp weapons across a room full of more-or-less inebriated people without causing injury. This is a skill that the more excitable French have failed to achieve. Nevertheless, the game of darts is regarded as très cool and a solution has been found. The board is constructed with thousands of tiny holes, cunningly contoured to guide the soft plastic-tipped darts into place.

It's certainly a major contribution to public safety, but it rather noddifies the game. For a start, the balance of the darts is all wrong and the silly plastic points bend. From there it gets worse — far worse. This is not just a dartboard, this is a vast console over two metres high. Below the board itself is an array of buttons, a VGA-style monitor, and a slot which takes quite sizeable amounts of money (you didn't really think this was going to be free, did you?).

Having chosen from eight languages and dozens of game variations, you feed the slot. Costs vary: a quick 301 straight-in straight-out is around 50 pence, whereas 701 double-start double-finish is around four quid. Though this may seem rather a steep outlay, given the local standard of talent, the latter game can provide several hours-worth of amusement. Scoring, naturally, is automatic, and there's a sound option that speaks the score in your chosen language and plays dismal little jingles. A half-size replica of the board on the screen shows, somewhat redundantly, where your darts have landed, and for the very hard-of-thinking there's a life-size graphical reminder of how many darts you have left in your hand.

There was, perhaps, a bug in the firmware of one such device, in that it scored darts that bounced out. Another model appeared to award random points to darts that missed the scoring area entirely. And so it goes. Take a popular game that requires a minimum of equipment but skills in hand, eye and mental arithmetic. Add a few safety features, a computer, colossal expense (it costs more to hire per week than a dartboard does to buy) and take away most of the skill. A clear and classic case of how to bugger things up with computerisation.

What's especially depressing is that there are doubtless those who see this as an improvement, a technological breakthrough. What next? The computerised frying pan (only £299!) that tells you how many sausages it contains, how brown they are and whether it's lunch or dinner? An SQL front-end to the fridge that allows you to catalogue your collection of leftovers and sort them by date, category, nutritive value and degree of mould?

And let's have another look at that dartboard. There's still the problem of flying objects, and the need to keep a corridor of valuable drinking estate free. Why not virtual darts, where each player takes a turn in a small cubicle, gesturing in a vaguely dart-throwing way into a virtual 3D space? That should, with luck and sufficient design expertise, take the last vestiges of fun out of the game and render it, literally, pointless.

● In September's column, I attributed the observation that "people in an organisation rise to their level of incompetence" to Professor C Northcote Parkinson. Several readers pointed out the rich irony that I seem to have risen to mine. This is not Parkinson's law, which is the law about work expanding or contracting to fill the time available, but the Peter Principle, formulated by Dr Laurence J Peter. Apologies to Parkinson, Peter and everyone else. ■

Straight Talking

Barry Fox

It seems the online world is out of order, particularly where service operators are concerned.

The postal strike of the eighties was a gift from the gods for Japan's electronics companies. They shipped in fax machines at the then low price of £1,500. People started sending faxes instead of letters, and it snowballed.

The recent postal and tube strikes are a similar gift for the online service operators. Everyone has heard of the internet, and high-speed PC modems cost under £200. People are ready to use email instead of struggling to work or sending faxes and letters.

Service operators know that getting in early and winning customers is the name of the game. Once someone has set up an account, got an internet address and had it printed on cards and notepaper, they need a very good reason to switch accounts. Hence the mass of free trials. This runs in parallel with the battle to create a de facto standard for internet browsing.

"Can you recommend a service and system?" writes one reader. No, but here are a few practical tips. A couple of months ago I warned of difficulties experienced with BT Internet. Reactions were divided between those who had hooked up without any problems, and those who had foundered and found BT's helpline very little help. At an IDG conference, one of BT's other division heads admitted he had tried BT Internet and rejected it. If BT's internet management learn from mistakes made during the premature launch, the system could be worth another try.

Every week, Quarterdeck seems to buy another company to help it become a major player in the online game. Internet Suite 2 has an improved version of Mosaic, with more bells and whistles, to rival Netscape. The promise is that IS2 works with whatever online service you are using. I tried it with CompuServe and got a string of error messages about "illegal operations", putting CompuServe Dialler out of action and locking up the PC so firmly that it had to be crashed out with the reset button.

Quarterdeck in the UK told me the company was aware of problems with CompuServe and that modified software was available for downloading. Then I got a fax from Paul O'Dowd, technical support manager in Ireland, contradicting the UK office. "Our group in Paris will be evaluating the CompuServe script... At this stage, however, we have not confirmed that the script is at fault."

"Our technical support team has now reached an appropriate size," O'Dowd assured me, promising callers "a prompt service." Several weeks later, a reader wrote complaining that when he phoned Quarterdeck's Help Desk, he was left on hold for thirty minutes and then heard the recorded announcement change to "We are closed for the day".

CompuServe is bundling Netscape with WinCim but has already run into problems. Anyone with MS Office, hardly a rare and unusual package, can expect the error message, "Cannot use Dynalink". WinCim behaves like an invading cuckoo and overwrites Windows DLL files with no option to stop it. The originals seem to work alright if they are left alone. The fix, if you can identify the cuckoo'd files, is to rename them to allow further overwriting, reload Windows and then MS Office.

CompuServe's knee-jerk reaction was to blame Microsoft. Come off it! MS Office came first, so WinCim-plus-Netscape is the villain. CompuServe's new spokeswoman, replacing the last one who jumped ship for competitor AOL, admitted that no-one at CompuServe had tried WinCim with MS Office. "We will try and put a fix on the next batch of discs," she floundered. I asked when the next batch was due and how victims could distinguish between dangerous and safe. "I don't know," she admitted, promising to get back. But she didn't.

Microsoft has so far failed to make much headway with MSN. Journalists are now eligible for a free account, so I gave it a try. Frankly, I'm not surprised MSN hasn't caught on. With no instruction book, I have not yet found any way of preparing and reading mail offline. The audit trail of my enquiry to MSN's online customer support may one day look funny, but right now it's just infuriating.

"How do I set up the system to use an ISDN line and Racal DAP 6300 terminal adaptor?" I emailed by analogue line. Back came a pile of standard form answers, telling me to download an MSN update. That made no difference, so I repeated the question. An MSN Helper then bucketed back more irrelevant standard forms and asked me what brand of terminal adaptor I was using. And so it went on.

If it wasn't a free account, I'd have cancelled it by now. I pay for a CompuServe account because they can't go into a sulk and disconnect me because of something I've written. The system works smoothly if you stick with the older WinCim/Mosaic software, but it's overpriced and short on competent staff.

The online market is still wide open for a Consumer Best Buy. If you want to pass on your personal favourite, fax me on 0171 483 3074 and I'll publish a rundown. ■

Business Matters

Use your imagination: the benefits of using a PC in the workplace lie in creativity rather than productivity.

Brian Clegg

What does a business get out of using PCs? Probably not productivity. There is real doubt as to whether PCs make people more productive, but there is lots of evidence that they improve quality and creativity of output. This is something you'll rarely see mentioned in the scare reports about the hidden costs of owning a PC. Perhaps the bean-counters who write them never consider the benefits because creativity and accounting are rather uncomfortable bedfellows.

Strangely, these reports tend to be initiated by PC manufacturers, the high price brigade, who like to point out that their exorbitant prices are tiny compared with the lifetime cost of a machine. I take the amounts quoted with a truckload of salt. If it really costs a company $8,000 a year for each PC they run, they should consult home users on how to manage them for a lot less. What you can guarantee is that the reports remain one-sided. Benefits like quality and creativity may be harder to measure than cost, but they ought to be considered.

PCs have had a stunning impact on the quality of office work. The other day, while clearing out a box of junk, I found a report I had produced in the seventies for a major airline. The text was poorly set out and typed in a blocky, uninspiring font. No doubt there were spelling mistakes and wording that I would have liked to have improved, if I'd had the time to retype. The graphs were the biggest shock. Hand drawn, they looked more like schoolwork than a professional report. Compare this with a similar report produced today. The typefaces and layout would be worthy of this publication, while the graphs would be beautifully printed.

It's possible to argue that this is just gloss. A study of American students using Apple Macs showed that they produced sloppier work than their peers; however, I'm inclined to put that down to the sort of US student attracted to the Mac rather than the involvement of a computer. In most cases, the use of PCs has resulted in a better look and feel for the work produced with them, and that's important. Like it or not, the reader is influenced by the style of a document, and the old report was much less likely to have received serious attention. What's more, it was harder to read, decreasing the recipient's ability to absorb the content. Spelling mistakes distracted from the message. If a slide with an error is shown at a presentation, you will often hear a murmur as the audience point it out to each other. They've forgotten what the presentation is really about. Most powerfully of all, the way that a PC user can revise a piece of work through several rapid iterations can improve the content in a way that was totally impractical on paper.

These benefits are there whether working on a report, a presentation or a spreadsheet. The PC doesn't guarantee improved quality, but it provides the opportunity. With quality polished up, the other contribution the PC can make is to enhance creativity.

This seems unlikely at first, as creativity is a very human capability. The trouble is that while we are all naturally creative, the pressures of survival ensure that we suppress our tendency to innovate. If no-one learned from experience, when it came to eating poisonous berries or crossing busy roads, the outcome would be less than constructive. Once we have dulled the natural creativity we had as a child, it's difficult to revive it.

In recent years, techniques have been used to enhance individual creativity. This isn't the place to go into them but if you'd like to find out more, check out the creativity section on my home page, http://members.aol.com/NotAHome, or email me for some further reading, but the point is that all these techniques rely on forcing people to come at the problem or idea from a different angle. It's as if we've all got tunnel vision, bounded by our experience and education, that prevents us from seeing the creative options. Creativity techniques can break through the tunnel as can PCs.

Sometimes it's a matter of applying a tool like a thesaurus to modify an idea. Sometimes it's using email or a bulletin board to brainstorm. Most often and most insidiously, the PC will provide the creative nudge by encouraging a step on the wild side. Playing games and browsing the web are generally discouraged in the workplace, yet both can be the spur to break out of ordinary thinking and come up with a creative insight. The benefits of PC use are there in quality and creativity. The only problem is getting the colour-blind accountants to notice the appearance of the goods they're buying as well as the price tag.

● I'm happy to reply to readers' comments via BrianClegg@msn.com. ■

Letters

Send your letters to:

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or email
pcw@vnu.co.uk
or **CompuServe**
71333,2330
or fax **0171 316 9313**

The cat's whiskers
I use a DOS word processor called Eight in One on an old Toshiba portable, and export ASCII files into Ami Pro for a tidy print-out. Eight in One uses about 200Kb of disk space (and you get a reasonable spreadsheet and database as well in that). "The cat sat on the mat..." in Eight in One takes up just 54 bytes. The Tosh, of course, has just a 20Mb disk, but it all works happily and has been in daily use since about 1988.
Andrew Parr
101352.2660@compuserve.com

Ian Black's letter about file sizes ["Conspiracy theory", *PCW* September] caused a wry smile. I typed "The cat sat on the mat" using both a DOS and a Windows text editor. The file size was just 24 bytes. 22 bytes of text give a "power to weight" ratio of 91.6%. Using Ian's figures I got the following:

Any Text Editor	91.6%
WordPerfect 5.1	3.6%
MS Word 2	1.2%
MS Word 6	0.003%

Any Text Editor is therefore 278 times as efficient as MS Word 6. Obviously, all employers should immediately equip their secretaries with text editors. Interesting, don't you think? After all, at the end of the day, they all say only that the cat sat on the mat. Perhaps Marshall McLuhan was right and the medium *is* the message.
Raymond Jones
Lancashire

I am writing regarding the letter "Conspiracy theory", by Ian Black. The reasons for the length of a small file are things such as embedded fonts and headers. I made a file with Microsoft Word 7.0 with the phrase "The cat sat on the mat". I also made one that had the same phrase 20 times. Both were 11,264 bytes. The file size is only proportional to the content when the size increases more. The simple phrase "The cat sat on the mat" needs to have a font defined, sizes, "window view" style, and settings.

I don't know about you, but I don't have many files with one sentence in. Today's technology is advancing. The postcard you write one sentence on or twenty does not get any smaller!
Sebastien Lahtinen
seb@msn.com

Typing loud and clear
With reference to Eric Perryman's letter in the September issue, I also bought a Psion 3a after much deliberation, and for the same main reasons — software, screen, battery life and, most important of all, pocketability.

I touch-type but was aware (from a *PCW* review) of some misgivings about the keyboard. Yes, the keyboard did drive me to distraction, for about a day. May I suggest that Mr Perryman, and everybody else, try a simple solution that worked for me? Turn your

Have spanner, will see the difference: A little attention to general maintenance will improve the state and, hopefully, prolong the life of your PC (see "Keep it clean", page 56)

Psion on, go to System, Control, Sound and set Key Click to loud. The click provides a tactile feedback not unlike a full-sized keyboard. I can now type at a reasonable speed and the only mistakes I make have nothing to do with the Psion.
Stephen Blake
100407.2107@compuserve.com

A thing of beauty and a joy to behold, and, er, a disaster: that's our new CD

Having returned from holiday, what a joy to pick up the new CD-ROM. It's a first class example of what can be achieved with multimedia (although I await to read letters of complaint which will undoubtedly arise when you change something).

I particularly like the way you've integrated Netscape. It will give all readers the chance to try out browsing without an internet connection and maybe it will provide the incentive to take the plunge.

Also, the Acrobat format for Hands On is a great idea. One suggestion: could you show the length in time of the .mid & .avi files so we know what to expect before trying them?

Keep up the good work.
DP Bardell
DPBardell@aol.com

The new cover disk is excellent. It is easy to use, quick, and does not appear to have trashed any part of my system. One day, all cover disks will be made this way.
Dave Fletcher
101323.3575@compuserve.com

I found the new-style cover CD very good. It's a refreshing break to see such effort put into a production, and it shows. What you need to do now is keep it refreshing. Don't keep the same old tunes and user interface for months on end but change it a little. I particularly like the way you have used Netscape Navigator and Adobe Acrobat.
Glenn Owens
100725.107@compuserve.com

The new *PCW* cover disk is 10,000,000 times better. It is a great improvement on the old clunky, slow and annoying disk.
William Walton
wil@globalnet.co.uk

The new PCWI is a vast improvement on the old "clunky" version. I'm particularly glad that you now have a "loader" screen before the main menu to fast-track into areas of particular interest. Indeed, you could expand on this for those of us who don't want to take up time navigating our way through pretty screens, delightful though they might be the first couple of times!
Charles Maplestone
Spilsby
Lincolnshire

I firstly wish to congratulate you on your new cover CD-ROM design. The September issue was my first of a year's subscription, but I spotted one thing wrong. I have been thinking of buying either SpeedyROM or D-Time, as my CD-ROM drive is slow but I cannot afford to upgrade at the moment. I was therefore pleased to see SpeedyROM listed under the resources section of the cover disk, on the cut-out contents sheet. However, I was deeply disappointed when it was nowhere in sight. I even tried manually searching all through the CD, but to no avail. If it is on there, could you please tell me where?
DC Precious
Stevenage
Herts

Usually the "free" CD is entertaining for a couple of minutes, contains maybe one or two short files of interest and does not clutter my hard drive. The new format from September has revised all my views. Now it clutters my hard drive and desktop, takes minutes to load and is almost unreadable without resetting screen colours and resolution. I am all for innovation, but this upgrade reminds me that "If it isn't broken, don't fix it."

Perhaps you could encourage those who dreamt up the format to go into politics. They appear to be good at fouling things up.
Tony Meredith
100554.2265@compuserve.com

What on earth are you trying to do with your cover disk? I have never seen such an overblown, self-important waste of time. Using Netscape to access information is probably the worst idea imaginable — it takes forever!

If this is your idea of an improvement, then I will not be buying your magazine again.
Steve Ayres
100553.316@compuserve.com

Your new CD-ROM interface is an unmitigated disaster. Trendy, perhaps. Practical and user-friendly, definitely not. Why must every screen be accompanied by irritating percussion rhythms? Why is there no index? Why do I have to wander all over the screen to find points to click on? And what on earth possessed you to include Netscape Navigator as a means of copying zip files from CD to disk? Talk about technology for technology's sake! I know that Pentiums are big and hairy, but why add to the processing load with non-essential, non-intuitive software?

It's a good idea to include the text of the "Hands On" section, but was it really necessary to use Acrobat? It wastes nearly 5Mb of disk and seems very limited.

The actual content of the CD is much the same as normal — some good, some boring. However, I have found it much harder to find the interesting bits using my preferred tool, Explorer. If you want to make the CD accessible, why not use an interface similar to Encarta? Plain, uncluttered tools have a lot to recommend them.
David James
davrjames@aol.com

PCW replies: *We've received dozens of letters about the new CD format. The second edition of the CD, on this month's CD-ROM, already includes many of the improvements suggested by readers. Quarterdeck has still not supplied SpeedyROM to us, but as soon as we receive it, we will put it on the cover CD.*

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A walk on the nice side

Michael Hewitt is right to question some aspects of the science of consumer and customer services as seen by those working in the computing industry ("Sounding Off", *PCW* September). His views are echoed by our experience working with local groups and organisations. When hardware fails and you find out the true worth of a warranty, or even something as simple as requesting costs for a specified machine by emailing Evesham Micros and faxing Dell, nothing comes back despite such state-of-the-art communications.

Has the industry itself considered developing a trade federation which not only handles the nice side of the field of computer consumerism, but also handles genuine grievances between consumers, manufacturers and suppliers? Even computer hardware and software is covered by the Sales of Goods and Service Act.

Pete Adams
@mediaOptions

Waiting for the rot to stop in the PC industry

Spurred on by Michael Hewitt ("Sounding Off", *PCW* September) I wish to add something to his arguments against PC sellers. I have worked for a variety of PC manufacturers and sellers, and feel ideally placed to raise a few points.

Firstly, build quality. It is quite true that there are any number of computer manufacturers in England alone where the engineering skills and dedication to quality among assemblers is non-existent. The reason is that these companies pay and treat their assemblers and engineers appallingly. If you pay peanuts, you get monkeys.

Taking a random fistful of the PC builders who litter the advertising section of any computer magazine, you can expect to find the odd one which builds solid, reliable computer equipment. You will also find some who build machines which will be okay as long as you never want to expand them. In some cases, the big names are as guilty as the opportunist box-shifters.

You will also find companies who sell machines built in sweatshop conditions by people in no position to refuse work. These are the machines whose components are likely to be rattling around inside the case before the carrier has even dropped the box abruptly at your front door.

It surprised me when I first came across such a company. I went in as a contracted bench engineer, to clear their returns backlog. People had sent their PCs back as DOA (dead on arrival) and were not getting their "48hr repair" back for 14 days or more. Some of the reasons machines were being returned were even more surprising. IDE cables which had been glued into motherboards had snapped out of their bindings. Many other machines were returned because cables had been put (read forced) in the wrong way. Alternatively, there were the machines whose processors had melted as a result of cables being jammed into the heatsink fan.

Now, to me, these are all trivial things, quickly put right. But as an item of consumer electronics, a computer should be built considerably more carefully. You would never have to open up your VCR and re-insert cables or connectors. In this respect, the computer industry is a shambles.

You cannot afford to make rash decisions when you buy a

p56 ➢

PC. If you insist on paying, say, £700 instead of £1,000 for a Pentium 100 computer of equal specification, you can easily find yourself losing that other £300 in downtime, repairs and support costs.

Equally important is an astute approach to buying computer services. There are some good dealers and products out there, but to see through the bad ones you need to be able to see through their advertising. If you buy unbranded equipment, you take your chances. It's as simple as that.

Let's hope the new processors from Cyrix, the affordable RISC technology from Acorn and the OS-independent Netscape can shake the boots off the rotten business that is the PC. Having said that, looking at the network computers in September's *PCW*, I wait with bated breath for the Ronco Netomatic running Netscape Navigator for CP/M.

Aidan P Richardson
106123,3707@compuserve.com

Keep it clean

Reliability? Michael Hewitt considers PCs to be totally unreliable ("Sounding Off", *PCW* September) and then bemoans the fact that he, a professional columnist, failed to back up his work! The comparisons he gave are, in my case, farcical: my Hotpoint fridge packed in the day after the extended guarantee expired; however, the PC I am using to type this letter on is over seven years old and still going strong.

He mentions that his PC is an unbadged one. I suggest he purchases his next one from a reliable manufacturer, as the components in many of the unbadged boxes may come from a dubious source. The many "wanted" adds in the computer press requiring memory, hard drives and monitors "working or not" point to a mini-industry recycling dodgy parts.

Personally, my PCs (I own several) are all from well-known manufacturers. In fact, I have received superb support regarding upgrading the hard drive on an old 286: AST obtained (from America) the replacement BIOS chips so that I could fit an IDE drive — and they supplied them free of charge.

The other point I must make is one of Preventive Maintenance. In order to keep things cool, PCs must be adequately ventilated by clean air. Smokers beware — your smoke will wreck your PC as well as your lungs! I vacuum out my PCs at least once a year, as well as cleaning my floppy drives, keyboards and mice as and when necessary. My hard drives are regularly defragged, surface-scanned and virus-checked.

So come on, Michael, get yourself some decent kit and maintain it correctly.

Paul H Price
Wrexham, Clwyd

Check it out

I bought a cheap DX33 last October from a local high street computer shop. I am a mature student, so I was pleased to find a 486 of any kind with basic multimedia for £600. However, the video seemed to be limited to 16 colours. I found out I did not have the drivers for my supposedly 1Mb video card; I finally got these from the dealer (with scruffy handwritten labels).

I next found that I had no printer drivers for Windows (3.11 WFW). When I complained, the dealer replied: "You didn't tell me what printer you had", which seemed a bit daft. I was lent another set of elderly, much-handled disks.

I could not judge the speed of the PC at first, as I had just graduated from an XT-turbo which was incomparably slower. Then *PCW* reported the fake cache scam: testing with Cachecheck proved that the cache on my motherboard was fake. The next thing I did was to examine the motherboard to see whether the cache was replaceable. It was in fact soldered in, so the answer was no. However, the examination showed that: my main memory SIMMs were 100ns, and the "1Mb" video card had only 512Kb and no upgrade capability.

All this hassle led me to check other details. I discovered that my Windows and MS Office were not licensed. Microsoft has graciously allowed me to continue using them as I bought them in good faith with the PC, but, of course, I get no technical support or upgrade privileges.

Worst of all, the local Trading Standards office, in spite of considerable effort, seemed unable to take any action which would recompense me, largely because there was no solid evidence of the advertised specification of the PC.

This tale has a moral: beware of your friendly local computer shop. If your dealer will not provide a detailed specification, there is a reason. Go somewhere else.

Mike Barwise
bar0697m@uel.ac.uk

***PCW replies**: A cautionary tale, and one of many we have received on this subject. Readers should be aware, though, that Cachecheck gives odd results on some systems. We have posted a second check program, a "lite" version of Eurosoft's PC-Check, on our site at www.pcw.vnu.co.uk.* ■

Try – but only if you want to buy

Jill D (Letters, *PCW* August) is correct when she says that CompuServe requires a credit card before they will let you use any of the "free" trials included with most magazines. However, she seems to imply that there is no charge if the free hours are not exceeded.

This is not so. About a year ago I foolishly decided to try a free trial. After signing on I was asked for my credit card details which I then gave. Because of a very slow modem, I found the whole process of using CompuServe so frustrating that I only stayed connected for a few minutes before giving up and wiping the whole program from my machine.

Since that time, my credit card has been debited £6-odd every month. I don't know how long this will continue, but I think it's a liberty and a big con trick. Barclaycard tells me that they can't stop the payment, and that I ought to contact the payee and ask them to stop collecting it. I have phoned CompuServe several times but have not been able to get through.

I used to receive an occasional American magazine from them but I don't even get that any more. So be warned — don't try it unless you want to buy it.

Mike Earley
Eastleigh, Hants

Gadgets

PCW Gadget Photography by David Whyte

ADI Duo Multimedia Pack

Computers are becoming much more common in the home, but the trouble is that most look like boring office equipment. Why not hide the main box under a table and consider ADI's highly-stylised Duo Multimedia Pack, consisting of mouse, Windows 95 keyboard and 17in colour monitor? The monitor is capable of displaying 1024 x 768 non-interlaced at up to 75Hz, while the built-in speakers output 7 Watts per channel. The Duo should be available early September at an RRP of £589 (plus VAT). ADI says the Duo Multimedia Pack will navigate you from the stone age to the year 2000. Ya ba da ba Duo indeed.

ADI Systems UK 0181 236 0801

Nintendo Gameboy Pocket

This Gadgets column occasionally features products that are infuriatingly only available in Japan. Here's our revenge. Nintendo's Gameboy Pocket, out 1st November this year, is 30 percent smaller and 50 percent lighter than a standard Gameboy, but still takes the same game cartridges. The best news? This beautiful stylish brushed metallic finish is only available in the UK and the US, while the Japanese will have horrendous-looking bright-coloured versions. Ha ha ha. Save up £49.99 (incl. VAT) and head straight for the shops in two months' time.

THE Games 01703 653377

Nintendo 64

On Sunday 23rd June, Nintendo's long-awaited 64-bit games console hit the streets of Japan. By the end of the day, retailers reported a quarter of a million sales. By the end of August, Nintendo expects to shift 1.5 million units. Impressive? Wait until you see it in action. Unfortunately, we may have to wait until next Easter for UK PAL units, expected to cost around £250 (incl. VAT) without a game. Those who absolutely cannot wait could opt for a Japanese import, currently going in specialist stores for around £600 (incl. VAT). Pictured here is the innovative controller, complete with analogue joystick in the middle section. You could phone Nintendo's exclusive UK distributor, THE Games, but they haven't got any and have been instructed to say nothing. Instead, why not read our in-depth look at this marvel of gaming technology, this issue, page 112.

THE Games 01703 653377

Microsoft Intellimouse

We've seen our fair share of pointing devices on the pages of *PCW* Gadgets, but the new Microsoft Intellimouse features something found on no other: a dial. Yes, that grey wheel in the middle, which also doubles up as the middle button, offers a facility so obvious you'll wonder why no-one had thought of it earlier. Why waste time moving the pointer to the scroll bar when you could leave the mouse where it is, and scroll up and down by rotating the dial? You can also use it to zoom in and out of documents, which is great for spreadsheets. Brilliant. First supported applications include forthcoming Office 97, Internet Explorer 3, and Windows 95 Explorer. No UK details yet, but the Intellimouse will début in the US in November for $84.95.

Microsoft 0345 002000

Apple Family Performa

The black Mac is back in fashion. Perfectly at home with the hi-fi, the new top-of-the-line Apple Family Performa is more than just a pretty face. For a mere £1,699 (plus VAT) you'll get a 180MHz PowerPC, 16Mb RAM, 15in monitor, TV tuner, 1.6Gb hard disk and eight-speed CD-ROM. A machine that truly lives up to its name.

Apple 0181 569 1199

Nikon E25

These cheap consumer digital cameras are all very well, but what if you want professional results? Surely the best plan would be to stick a decent CCD and all the electronics in a conventional and familiar professional SLR camera body. Kodak's been doing this for years with Nikon and Canon bodies, but here's a more interesting collaboration. The chunky Nikon E2S handles just like a professional SLR and is compatible with most of the highly-respected Nikkor lenses, along with several Nikon Speedlight flashguns. The CCD boasts 1280 x 1000 pixels with four levels of JPEG compression. A 15Mb Type II PC card can store about five images in hi-uncompressed mode, 21 in fine, 43 in normal or 84 in basic . The E2S's features would fill this page, so contact Nikon or check out our forthcoming digital camera feature. For now, you'd better know that the E2S body alone costs £11,360 (plus VAT). **Nikon UK 0181 541 4440**

First Impressions

Along with the usual haul of hardware and software reviews, the new-and-improved First Impressions looks at CD-ROMs and edutainment goodies, and re-houses Long Term Tests. Don't miss Dotlink's powerful PC which towers above the rest (p64), or Toshiba's new Tecra (p72). Quick off the mark, we review the latest beta of Microsoft's sly old FoxPro 5.0.

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Ratings

★★★★★ Buy while stocks last
★★★★ Great buy
★★★ Good buy
★★ There's a better buy somewhere
★ Buy it and weep

VNU European Labs

VNU Labs tests cover every kind of hardware and software including PC hardware, printers, network products, modems and software applications. The tests are continually developed and enhanced to reflect developments.

Our tests closely simulate real-world use. For example, our suite of PC benchtests uses complete versions of industry-standard Windows 95 applications — currently Word, Excel, WordPerfect and FoxPro. We also run a graphics re-draw test using CorelDraw 6, and a Doom2 frame rate test which is a good indication of games performance.

Application tests are the backbone of all the VNU Labs system evaluations, but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as

low-level tests) can reliably tell the difference. VNU Labs' system-level test suite is called Euromark. Mainly Windows-based, it is used to isolate specific components like hard disks, graphics cards and CD-ROM drives.

■ To make them easy to read at a glance, all graphs in *PCW* are drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the time in minutes and seconds to print a page in a comparative test of printers.

■ Hardware

SyQuest EZflyer

SyQuest's answer to the Zip drive.

SyQuest is retiring, bruised, from the entry-level removable-storage market. Its 135Mb EZ-135 was rushed out to compete with Iomega's market-munching Zip, but the company had problems keeping its costs down and was, at one stage, reportedly losing $40 per drive.

Ironically, SyQuest cut EZ-135 prices in July just prior to the admission that it plans to phase out the model during the coming months. But the company had also announced that the EZ-135 was merely the first of a series of backward-compatible PDC (Power Disc Cartridge) drives with capacities rising to 540Mb and beyond.

The EZflyer is the second in the series and reads and writes 230Mb carts (£21 plus VAT) as well as the older 135Mb variety, which will continue in production. It is more sleekly styled than the EZ-135 and (perhaps not by accident) bears more than a passing resemblance to Iomega's Zip. It has a smart, blue case, a window on top for viewing the cartridge, and on-off and eject buttons. The design is the result of market research, although SyQuest couldn't confirm whether this was the public wanting a smart blue case or, basically, a Zip drive.

SyQuest is selling two versions of the Ezflyer: parallel or SCSI, both for the same price of £204 (plus VAT). Although there's no IDE version, the possibility has not been ruled out. We tested the parallel version, which will be of particular interest to notebook users even though the EZflyer is powered by an external mains adaptor only.

SyQuest has got the blues — a smart new design for this parallel or SCSI-interface drive

Installation is fairly straightforward. Connect the parallel cable supplied, from PC port to EZflyer, and, if required, re-connect your printer to the pass-through port. Software is supplied for Windows 95, DOS/Windows 3.1, Windows NT and OS/2. For Windows 95 there's an installer which, along with the drivers, offers a couple of SyQuest utilities. The software installer for 95 is a bit odd in parts, requiring you to select SCSI controllers from Add New Hardware and then select SyQuest's parallel port device from the supplied floppy disk.

Following installation, the software discourages you from the traditional means of partitioning and formatting the disks, recommending instead that you use the new shortcut SyQuest utilities supplied. The utility's interface could be much improved and comes across as clunky, with too many windows. The parallel EZflyer defaults as drive D, forcing the previously installed CD-ROM drive to E.

The only complaint, from a physical point of view, is that it's very easy not to insert the cartridge far enough. A sticker warns you to push all the way until the cart drops down, but nevertheless it's still easy to be caught out and left wondering why nothing is happening. Performance is clearly limited by the parallel port, but we were looking at just under two minutes in which to transfer a set of multiple folders measuring 25Mb.

SyQuest is pitching the EZflyer at those people who want both high capacity and hard disk performance — a perceived higher sector of the market than Zip users. Such a market does exist and a year or two ago it would without doubt have plumped for the EZflyer. But a lot has happened over the past few months, including Iomega's excellent 1Gb Jaz drive. Prices of the Jaz have been cut to $399 in the US, and European price cuts will follow. SyQuest is about to release the 1.3Gb Syjet, which will have to be price-competitive with the Jaz and is not PDC compatible.

The big question has to be whether there remains a market between these drives at the high end, and the relatively cheap Zip and 120Mb LS-120 superfloppies (currently available only on Compaq PCs) at entry-level. For SyQuest, a great deal depends on the answer.

Clive Akass and Gordon Laing ■

•PCW Summary

SyQuest EZflyer

Contact SyQuest 0800 526559
Price £204 (plus VAT) parallel or SCSI version (230Mb carts cost £21 plus VAT)
Good Points Essentially a higher-capacity Zip drive.
Bad Points Higher-capacity drives don't cost much money.
Conclusion Could be a bit late.
★★★

p64 ➢

Hardware

Dotlink Power Tower

A balanced system at a budget price.

Dotlink's Power Tower represents amazing value for money on a bangs-per-buck basis. It has been designed to draw attention to the fact that this build-to-order supplier is widening its top-end range to cater for the demand for processing power at the £1,000 mark.

The basic Power Tower comes in at just under a grand when equipped with a 14in monitor. The size of monitor is the only weak link in a system that combines power and low cost with remarkably few compromises in specification, so we chose to review the identical £1,099 configuration which includes a Viewsonic 15in monitor.

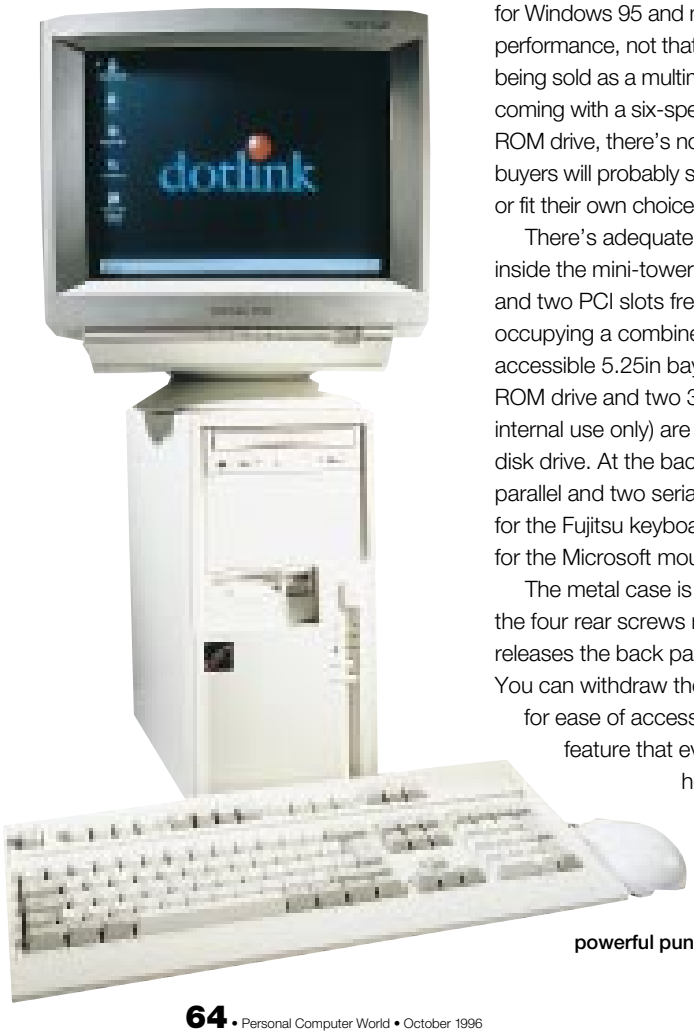
The system is driven by a Cyrix or an IBM 166+ Pentium-class processor. It doesn't matter which, because IBM makes the chips for Cyrix so the two brands are identical. These chips operate at 133MHz on a 66MHz bus, but are said to deliver performance slightly above a 166MHz Pentium, hence the 166+ designation. Our tests support this claim, returning the sort of figures one expects from a genuine P166.

Compatibility is an issue when using a non-Pentium processor but we didn't encounter any problems. We were reassured by the motherboard choice of Intel's HX430 PCI chipset and 256Kb of pipeline burst cache, which is upgradeable to 512Kb by popping another 256Kb into a CELP socket. The 16Mb of system memory in the form of two 8Mb EDO SIMMs can be upgraded, in this case to a maximum of 256Mb. Permanent storage is provided by a Quantum Fireball 1.2Gb hard drive, not large by today's standards but a fast performer. It's pre-installed with Windows 95, the only software bundled with the machine.

EDO RAM features again on the 2Mb Diamond Stealth 3D 2000 graphics card, one of the new breed of cards fully optimised for Windows 95 and multimedia performance, not that the Power Tower is being sold as a multimedia machine. Despite coming with a six-speed Mitsumi IDE CD-ROM drive, there's no sound card. Most buyers will probably specify one from Dotlink or fit their own choice after purchase.

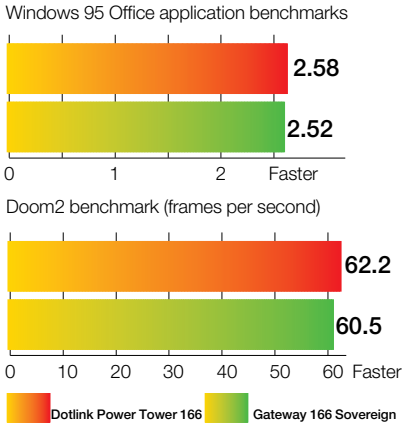
There's adequate room for expansion inside the mini-tower case, with three ISA and two PCI slots free, the graphics card occupying a combined slot. Two front-accessible 5.25in bays sit below the CD-ROM drive and two 3.5in bays (one for internal use only) are sited below the floppy disk drive. At the back there's the usual parallel and two serial ports, a DIN socket for the Fujitsu keyboard and a PS2 socket for the Microsoft mouse.

The metal case is unusual. Removing the four rear screws retaining the main case releases the back panel of expansion slots. You can withdraw the motherboard on rails for ease of access, and while this isn't a feature that everyone will use, it helps if you need frequent access to internal devices.



This PC packs a powerful punch for just over a grand

Performance results



Dotlink's Power Tower compared with Gateway's 166 Sovereign. Dotlink fitted a Cyrix 166+ and Diamond Stealth 3D 2000, while Gateway opted for Intel Pentium 166 and Matrox Millenium. Both have 16Mb RAM, but Dotlink's costs only £999 with a 14" monitor.

The final link in the system is Viewsonic's 15GS Plug and Play monitor, equipped with digital controls and an on-screen display for all functions including brightness and contrast. Attractively cased and with a clear, stable picture, its preset modes deliver refresh rates of 75Hz at both 800 x 600 and 1,024 x 768 resolutions. If you want more, there are eight user-definable settings permitting maximum refresh rates of 108Hz and 85Hz respectively. Both of these are supported by the 3D 2000 graphics card which is fitted to the Power Tower.

All of this serves to indicate Dotlink's attention to detail in matching the components of this budget power platform to provide a balanced system suitable for all but the most demanding user.

Paul Wardley

PCW Summary

Dotlink Power Tower

Price £1,099 (plus VAT) with 15in monitor; £999 (pus VAT) with 14in monitor.
Contact Dotlink 0181 902 5802; Fax 0181 903 6508
Good Points Value for money. Expansion potential.
Bad Points No sound card or software treats, but what can you expect at this price?
Conclusion A well-built machine assembled from a wisely-chosen set of components to deliver high-end performance at mid-range cost.

★★★★★

p66

Software

Mini Office Home Finance

Solid software to keep your coffers kosher.

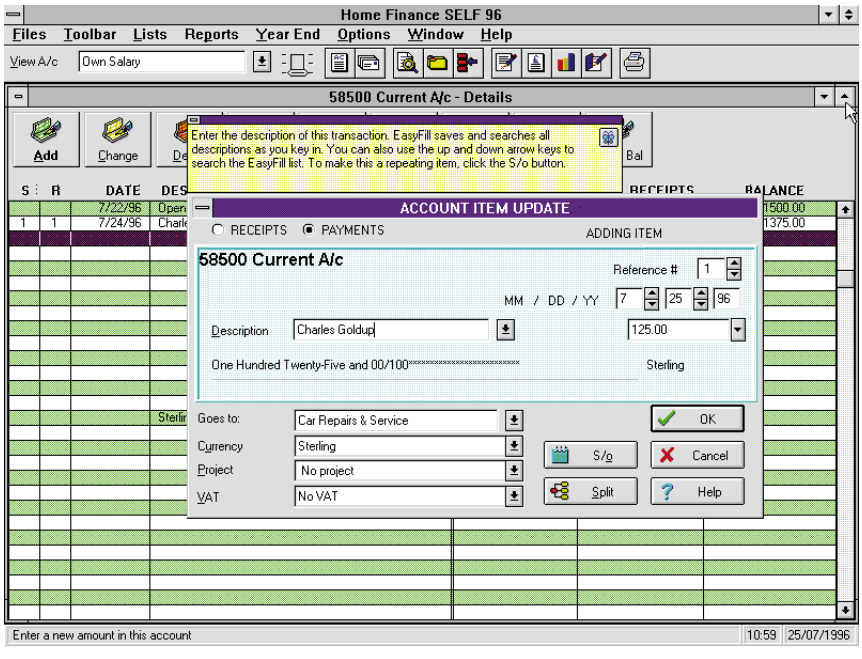
Mini Office Home Finance is a personal finance manager, and one might justifiably wonder what sort of an impression Europress thinks it is going to make in a market dominated by Intuit's Quicken and the Windows 95-specific Money. Against such stiff competition Mini Office Home Finance would have to be a very solid piece of software indeed, and so it is.

Mini Office Home Finance is a well-established old friend called MoneyBox. It has been around for a long time. In the dark ages of DOS, we devoted four whole pages to reviewing MoneyBox, which not only gives you some idea of its status in those days but also its track record. This is a mature, solid, and regularly upgraded package from a developer who is both approachable and receptive to new ideas and other user demands. While it doesn't have the glitz and glamour of Quicken or Money and lacks some of the useful add-on features of these packages, MoneyBox is powerful, easy to use and, in some respects, better suited to the small businessman.

Version 5.0 is the latest and has new features, like improved data entry with optional "cheque entry" format and split items, password protection to prevent others from viewing your accounts, and a fully-integrated invoicing feature. There is improved reporting, and the analysis features include project accounting and more sophisticated VAT accounting, allowing greater control of finances for the professional user.

Mini Office Home Finance works in much the same way as other personal finance software. At setup, you choose the type of account you want: home, business, student or skeleton (the latter allows you to add your own categories). Once this has been done, enter the opening balance of your bank statement, add up the amounts and enter all the monies you have received and spent since the statement was issued.

New information is entered in an on-screen representation of a cheque. Every transaction is given a reference number, date (curiously in MM/DD/YY instead of the British DD/MM/YY) and a description (i.e. the person or business making or receiving the payment and the amount). You also enter the category such as Bank Loan, Mortgage and Dining Out, the currency (pounds sterling, marks and francs), and (optionally) whether the payment is a standing order or split transaction.



Avoid going into the red by keeping track of personal accounts.

You can choose from three skill levels. The Beginner level is bank and charge account management, little more than the ability to keep a check on your finances. At the Expert level you have additional features enabling budgeting and financial reports (among them trial balance, I&E, Balance Sheet, Financing). At the Professional Level, the accounting needs of the independent business operator are supported, including automatic handling of VAT (GST, TVA).

Its strengths are that it is easy-to-use, it handles foreign currency, it is self-balancing and can be audited. The invoicing feature is an excellent addition, making this a useful package for the small businessman. There are features to which I have grown accustomed in other personal finance managers, which are frustratingly lacking here: for instance, a database where you can store addresses and phone numbers and details about the people with whom you do business. Money has this feature and I have found it uncommonly useful. I would value a box which you can tick if you hold the receipt of a purchase. With the introduction of income tax self-assessment, you should have receipts available if asked to produce them by the Inland Revenue. Such a check box would be a quick and easy way of remembering whether or not you have stored certain receipts in that old shoebox. This isn't a deficiency unique to Mini Office Home Finance, just something I'd like to see added.

Mini Office Home Finance is a solid and reliable personal finance manager and is recommended as a simple, effective and moderately-priced package.

Paul Begg

PCW Summary

Mini Office Home Finance

Price £29.99 (incl. VAT)
Contact Europress 01625 859333. Fax 01625 879962
Good Points Solid, mature and reliable.
Bad Points Lacks a few features otherwise available with Money and Quicken.
Conclusion A choice worth considering.

★★★★

p69

Hardware

Olivetti Xana 73/200

A distinctive multimedia computer to-go — but not too fast.

The retro-style system unit is teamed up with a tilt-and-swivel base, monitor and keyboard

In these days of "me too" computers, it can be hard to find anything original to say about a new model once you've described its components. Not so the Olivetti Xana, which is distinctive in many ways.

The tower case design is retro-stylish in a sort of "The Man From Uncle" way, with rounded corners and contrasting colours on the front panel. There's the multimedia tilt-and-swivel monitor base incorporating a pair of amplified speakers with bass, treble and volume controls, on top of which sits an ordinary 15in monitor.

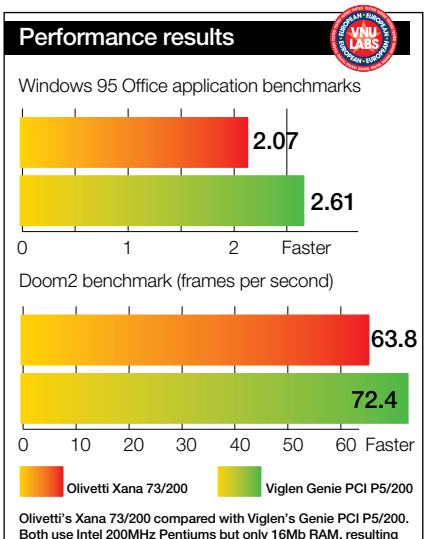
More unusually, the monitor audio base draws its power from a 9v output on the computer's sound card which fits into a proprietary socket on the motherboard, rather than the standard ISA expansion bus.

As is usual with a tower design, the motherboard is attached to an inside wall of the case. But the Xana departs from convention by using an expansion slot riser card, which means the slots end up being vertically-orientated at the bottom of the case. Five of them are free: two ISA, two PCI and one shared, although one of the PCI slots will only take a half-length card. In terms of drive expansion, there's a 3.5in internal bay for a second hard disk and two front-accessible 5.25in slots.

At the heart of this strange beast is a 200MHz Pentium supported by Intel's FX PCI chipset, 256Kb of pipeline burst mode cache and 16Mb of EDO RAM. Graphics output is from a Trident 9680 soldered onto the motherboard and fitted with an inadequate 1Mb of DRAM. This hardware can just about support a P120-class machine but a 200MHz Pentium deserves a more efficient HX motherboard, 512Kb of L2 cache and a decent graphics card.

These deficiencies showed in our lab tests and while the machine was running. The software MPEG player frequently drops frames, producing a stop-go motion sure to take away any viewing pleasure.

Performance results



Olivetti's Xana 73/200 compared with Viglen's Genie PCI P5/200. Both use Intel 200MHz Pentiums but only 16Mb RAM, resulting in poor overall performance. 32Mb P200's score over 4 in the Windows 95 tests: the Xana is the slowest P200 we've tested.

The reason for the Xana's odd mix of components is that it's the top model in a range starting with a P133/8Mb at £1,531 and sharing the same case and motherboard design. The more basic Xana 53 desktop range starts at £1,190. When we tested our review model the final UK specification had not been finalised, and although the hard disk is currently supposed to be 1.6Gb, ours was fitted with a 2Gb device. The eight-speed Goldstar R580B CD-ROM drive is a good performer and deserves to stay, as does the internal 28.8Kb/sec fax and voice modem.

The best part is the 15in monitor, an Olivetti DSM 60-510 with 0.28mm dot pitch. It handles vertical frequencies up to 110Hz, has a rock-steady picture which can be zoomed to fill the 13.8in viewable screen diagonal, and a good set of adjustments via an on-screen display panel. The multimedia base is a big disappointment. With 3D enhancement switched on and the volume turned down it's adequate for games, but increasing the volume increases distortion and vibration so there's no way you'd want to play music through it.

Olivetti seems to have its eyes on the home entertainment market, which is still fairly well populated with first-time buyers who are perhaps less demanding about performance and more interested in features. This is evidenced by a VAT-inclusive price, a microphone, colour-coded cables and a mix of multimedia software pre-installed on the hard disk. Most of it is not going to do anything very useful, but it's an attractive starter pack for people without any software of their own.

Paul Wardley

PCW Summary

Olivetti Xana 73/200

Price £2,599 (incl. VAT)
Contact Olivetti 0800 447799
Good Points Everything you need for multimedia and communications is in the box, and the software is pre-installed.
Bad Points Lacklustre performance. Price.
Conclusion The 200MHz version of Olivetti's Xana puts too much strain on the poor supporting hardware.

★★★

p71

Software

Visual FoxPro 5.0 BETA

An improved product but still only the bridesmaid, not the bride.

FoxPro started life as a better dBase than dBase. Its creator was Fox Software, acquired by Microsoft before the release of Access. Microsoft has lavished attention on its adopted child, with a succession of new versions for both Windows and the Mac.

Last year's release, Visual FoxPro 3.0, should have been a breakthrough product, with full object-orientation and strong visual design tools. There was an update to the venerable DBF file format to provide advanced features like enforced data integrity rules and triggers, which are routines that execute automatically when data is modified. In spite of all this effort, Visual FoxPro has, if anything, lost market share. Microsoft will be wondering if the new version 5.0 (in late beta release at the time of writing), renumbered to tie in with the next release of Visual Basic, can succeed in reversing the trend.

Still reeling from the radical changes in version 3.0, FoxPro developers will be relieved to know that version 5.0 has the same look and feel. Beneath the surface, it is substantially improved. Some changes are long overdue like syntax highlighting in the editor, a much better debugger and support for outer joins in the SQL SELECT command. A new coverage feature lets you track which lines of code are most often executed, to identify the most critical. Team developers can use Visual SourceSafe with the FoxPro project manager. Forms can now be top-level windows, letting you create applications that run independently of the main FoxPro window. Taken together, these new features provide most of what Fox developers wanted, with the exception of the outdated report designer which is little changed from FoxPro 2.0.

Visual FoxPro is now an OLE automation server, and like Visual Basic can create either in-process dynamic link libraries or out-of-process executables. The former are faster, but out-of-process servers have the advantage that they can be deployed remotely. All you need to do to create custom OLE servers is declare classes with the OLEPUBLIC keyword. Another improvement is that FoxPro now supports a wider range of ActiveX controls, including data-binding, and container controls which use iSimpleFrame. An internet control pack is supplied for quick integration with the World Wide Web and FTP file transfer.

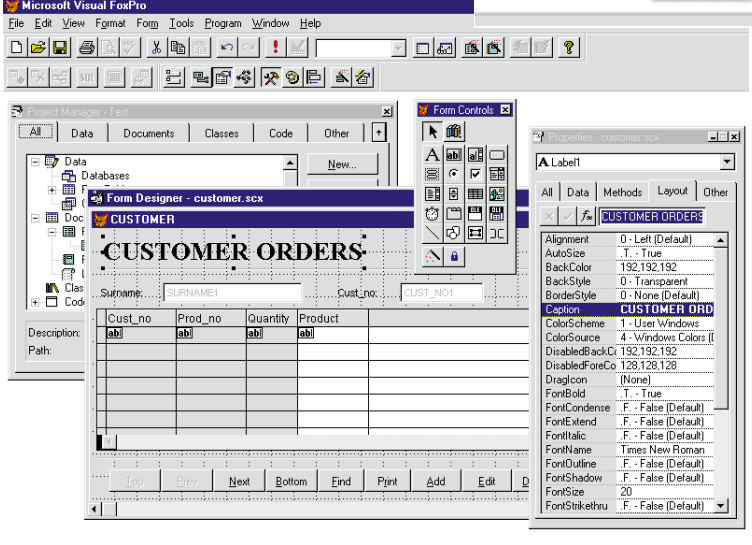
Although Visual FoxPro is primarily a product for handling data in trusty DBF format, it is also a capable tool for creating SQL clients. In this scenario, data is stored in a server database such as SQL server or Oracle, and FoxPro accesses the data through ODBC (Open Database Connectivity). Provided that the ODBC connections are successfully installed, Visual FoxPro easily handles these remote connections via a combination of wizard-created views and SQL pass-through for direct access to the server. New in version 5.0 is the CreateOffline function which disconnects a view so that you can work with the performance of local data. Then, a USE ONLINE command reconnects and updates the server with any changes.

Speedy data operations have always been a FoxPro trademark, but Windows versions have spoilt the effect with huge system requirements and a sluggish graphical interface. Visual FoxPro 5.0 is better in both respects. Performance improves on version 3.0 on the same hardware. Support for Win32s on 16-bit Windows has been dropped, but it never was very good. On a Pentium 133 with 32Mb of RAM, Visual FoxPro 5.0 was three times faster than Access 95 when executing a moderately complex SQL query against local data: an arbitrary result but evidence that FoxPro is still quick at data retrieval.

Visual FoxPro is undoubtedly capable, but will this version make more impact than the last? A resurgence of interest is unlikely but we can hope that its best features migrate to other Microsoft products.

Tim Anderson

FoxPro comes with a collection of solutions to demonstrate features. This one shows how to draw a graph at runtime



Visual FoxPro 5.0 looks similar to the previous version. The form designer looks like Visual Basic but supports powerful visual classes

PCW Summary

Visual FoxPro 5.0
(late beta release)

Price (Not yet available)
Contact Microsoft 0345 002000
Good Points Fast data retrieval plus great object-orientation, OLE and client-server features.
Bad Points Lacks native code compilation. Too much competition in Microsoft's own range. Complex to learn.
Conclusion A superb product but fated to remain on the sidelines.

★★★★

p72 ➢

Hardware

Toshiba Tecra 720 CDT

Nice features, shame about the speed.

Toshiba has been the most highly regarded name in notebooks for a long time now. Its machines are regarded as the most technically advanced, the most reliable and the most worthy of boasting about in the pub on a Friday night. The Tecra 720 CDT is Toshiba's latest product and one which intends to set the standards by which lesser notebooks are judged.

The first difference is the screen. Prior to switching on the machine it looks like just another 12.1in TFT (Thin Film Transfer), supported by 2Mb of VRAM, yet there is a full 1,024 x 768 pixels which can display that full resolution without scrolling around a virtual desktop. Change down to a lower resolution, whether 800 x 600 or 640 x 480, and the size of the display diminishes as the screen only uses that many pixels. It can be pushed up to 1,280 x 1,024 but only in virtual mode, so you will have to scroll around to find your way around the whole desktop. The quality of the display is excellent: moiré, bleeding and distortion do not come into it. The colours are sharp and clear and 16-bit colour is supported.

As befitting an all-singing all-dancing notebook, the PC Card slots support both Zoom Video and CardBus. These catapult the notebook from a simple multimedia machine to something a little more special. The difference in having Zoom Video is comparable with the difference you notice between software and hardware MPEG, but with just a little bit more. It takes the strain off your processor, bypassing the main PCI bus and talking directly to your graphics chip.

Distortion and bleeding give way to sharp, clear colours with this 1,024x768 pixel display

CardBus is for those who pursue maximum bits per second. There are still few PC Cards which can support these data rates. While the advantage of having CardBus on your machine is of limited use now, it does mean a certain degree of future-proofing in case this becomes the standard du jour.

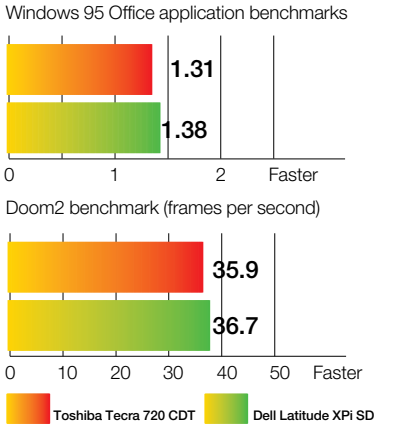
The multimedia components are above average. The CD-ROM drive is a six-speed which runs on only 5v (most other manufacturers use a higher voltage, sometimes up to 10v). The sound is FM synthesis and it blasts out from the large speakers, which is a vast improvement on the average notebook sound.

Other aspects were less appealing. Some people may like the nipple but we found it annoying, and the buttons were ill-placed for comfort. The CD-ROM and the floppy are interchangeable. You can run both together via a casing which plugs into the side of the notebook. You can choose which is the more useful and keep the other in the spare casing in case you change your mind at a later date. However, in a machine of this size and not inconsiderable weight, you would have thought Toshiba would have been able to find room for both.

The main spec is no less than required by a machine of this calibre: a Pentium 133MHz with 16Mb of RAM, 1.2Gb hard disk, 256Kb of pipeline burst Level-2 cache and a Lithium Ion battery to power it all. Despite this respectable component list, the machine was slow. Not just the application benchmarks, but the Doom2 tests especially, showed it to be little better than some of the Pentium 100s we tested in this month's group test (see page186) — disappointing for a model of which you have high expectations. Bells and whistles are all very well, but in the end it comes down to raw performance and this machine did not possess that valuable attribute. It reduced what should have been the most highly regarded notebook on the market to a mere status symbol.

Adele Dyer

Performance results



We compared the Toshiba Tecra 720CDT to the Dell Latitude XPi SD, winner of this month's group test. Both machines have 16Mb RAM but the Dell Pentium 100MHz comes out on top, despite the Toshiba's faster 133MHz Pentium chip. Disappointing result.

PCW Summary

Toshiba Tecra 720 CDT

Price £5,395 (suggested retail, plus VAT); £4,549 (street price, plus VAT)
Contact Toshiba 01932 828828
Good Points Great screen. All the bells and whistles you could wish for.
Bad Points Slow, for a pricey Pentium 133.
Conclusion Great features, not matched by great speed.

★★★★

p74 ➢

Software

Macromedia Backstage

You'll need a web server and deep pockets for this bit of authoring kit.

Macromedia seems pretty determined to take a slice of the web market. After the excitement of its Shockwave technology, the company has gone the whole hog and launched a complete web authoring package as part of the range of Backstage products.

This is the second most comprehensive suite of Backstage software, comprising Backstage Designer Plus, Backstage Manager, Backstage Objects (which automate threaded discussion groups, forms and email) and the Object Server which sends the Object scripts to the web server. All very promising. However, the Object server sits outside the web server, which isn't included in the package, and configuring the whole lot to work together is not for the inexperienced.

Installing the three main components isn't a problem as they all sit in a single directory. But after this, life gets tough and there is little in the way of wizards to guide you. Instead, you must be careful to assign the correct paths for the root directories, image directories and the CGI (Common Gateway Interface) bin. Get this wrong and Backstage simply won't work properly.

There are other problems. BackStage automatically installs an index.htm file (the home page for a web site) but you must be careful about where it goes and only the manual warns you of this. The install procedure will put it into the root directory of your web server, obliterating any existing index.htm file. You'll have to set up a new root so that any existing file scan can later be safely transferred. Confusing.

In this test, setting up virtual paths from the Object Server for images and the CGI bin failed to work properly, but to be fair this was with just one web server and a longer test would determine how well BackStage integrates with other commercial web servers.

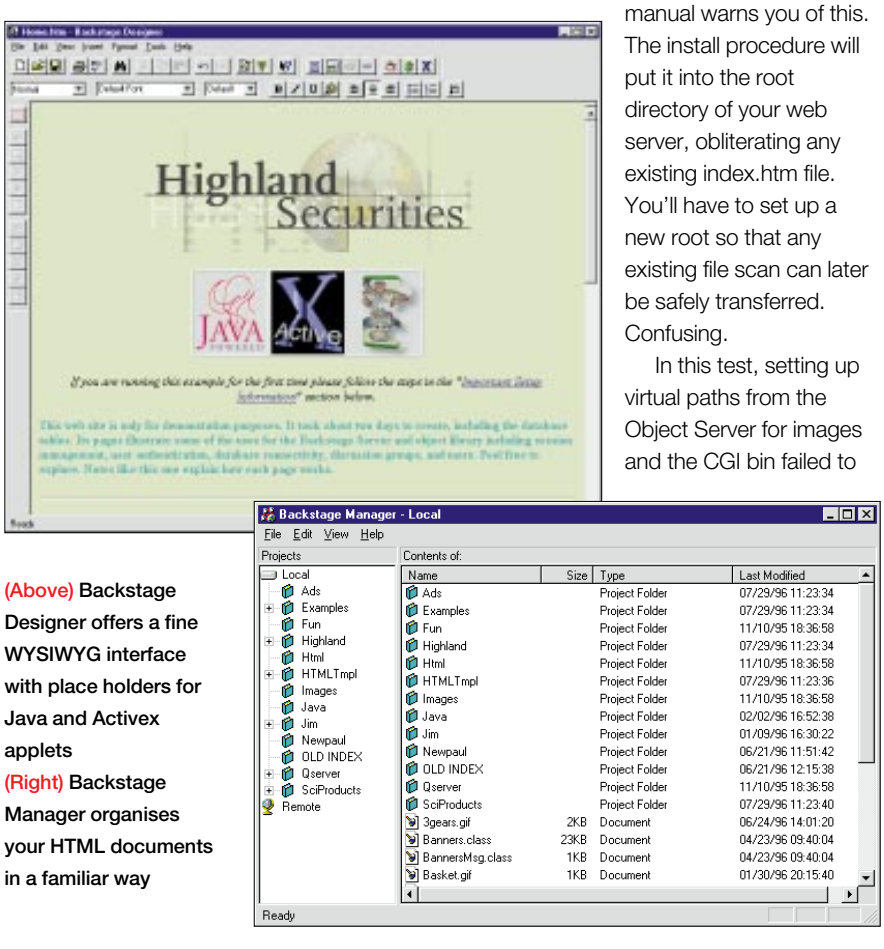
Assuming you get everything to work properly, you're ready to begin building your web site, replete with Java, Shockwave, interactive forms and other cool stuff. You must boot the Backstage Manager which controls all site-based HTML projects. The manual guides you through creating a new web site including ODBC (Open Database Connectivity) access to a simple database. Existing HTML docs can also be accessed via the Manager. To edit a document, double-click it and up pops the Backstage Designer which provides WYSIWYG access to HTML documents with drag and drop properties.

Macromedia claims this is so good that it dispenses with the need for browser preview. Really? I doubt many webmasters would want to trust this. Macromedia would have done better to integrate preview with at least the two leading browsers. Nevertheless, the WYSIWYG editor is one of the best and for simple pages at least the Backstage preview equated with what appeared in the browser window.

Adding Java applets and Shockwave from libraries (Macromedia includes a number of applets for you to try) was easy and worked well once they had been transferred to the root directory. Images are easy to apply. On the whole, the manual and Designer focus more on automating interactivity and database integration than cool design, which is surprising given Macromedia's pedigree. Frames and tables are given short shrift here.

Take away the plug-in applets and you are left with an expensive web package which offers very little extra over its rivals from Microsoft and Luckman. Worse, it doesn't even include its own web server so you have to pay for that on top and then configure the two to work together. It looks particularly poor next to Luckman's Web Commander which gives you nearly everything you get here except the plug-ins, plus a full-blown server, for far less money.

PJ Fisher



(Above) Backstage Designer offers a fine WYSIWYG interface with place holders for Java and Activex applets
(Right) Backstage Manager organises your HTML documents in a familiar way

PCW Summary

Macromedia Backstage Desktop Studio 1.0

Price £499 (plus VAT)
Contact Macromedia 01344 458600.
Web www.macromedia.com
Good Points WYSIWYG editor, Java and Shockwave support.
Bad Points You need a web server on top of all this.
Conclusion Far too expensive — this isn't the graphics art market, you know.
★★

p78 ➢

Hardware

Vale Platinum HXSE 166

Like a crack regiment, this PC is neat, efficient and performs with panache.

Occasionally, reviewing PCs gets you down. In such a fiercely competitive market, the PC builders often churn out tried and tested configurations with little imagination or innovation. This is all very well for the buyer, but it can get a little dull at our end.

Fortunately, it's not all doom and gloom. The big names sometimes come up with a fairly proprietary solution that may be interesting but often fails due to lack of compatibility or performance.

Call me sad, but as far as PCs go, the thing which gets me excited is a machine with most of the usual trusted bits, yet fitted out in a neat and efficient manner and at a decent price, of course. Evesham Micros' Platinum HX 166 is just such a machine.

From the outside it doesn't look particularly special: a plain ATX midi tower case, Ecoscan 17in monitor, Keytronic Windows 95 keyboard, Zy-Fi 2 Pro active speakers and a Microsoft PS/2 mouse. A bundle of Microsoft CDs consisting of Works for 95, Money for 95, Encarta 96, Golf, Dinosaurs, Fine Artist, Explorapedia and, of course, pre-installed Windows 95, make up the package. Sadly there's no Microsoft Office 95 here as standard, but Lotus Office 96 bundles are an alternative.

Looking forward to diving inside the case, I went for my screwdriver but found nothing to unscrew. Each panel of this case unclips and neatly slides off, one side at a time. You can remove the top, front and side panels independently. They're made of plastic, but the sides also have a sheet of aluminium inside. The security-minded will be pleased to find a lock, restraining the side panel behind which lies all the goodies.

Perhaps I've been in this business too long, but the insides of this PC really got me going. Today's manufacturers have got into the habit of neatly tying loose wires and cables together, but there's more to building a tidy PC than just eliminating the spaghetti.

Vital to the picture is the layout and orientation of the motherboard. Evesham has gone for a small Intel Marl ATX-style ML430HX board, fitted from the bottom left corner in portrait orientation. From the bottom up are three 16-bit ISA and four PCI slots (one shared), four 72-pin SIMM slots, Intel's 430HX Triton 2 chipset, on-board 256Kb pipeline burst cache, and an Intel 166MHz Pentium fitted in a ZIF socket-7. Fitted to the lowest ISA slot is a Creative Labs SoundBlaster 32 PnP, while in the highest PCI slot is a Matrox MGA Millennium with 2Mb W-RAM. 32Mb of 60ns EDO RAM is fitted in two 72-pin SIMM slots, leaving two free. Maximum RAM is 128Mb.

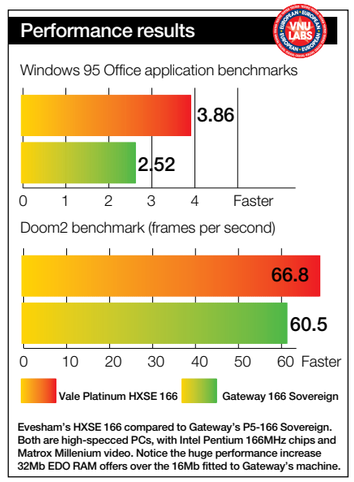
The clever bit is that the two 5.25in and three 3.5in drive bays stop where the expansion slots start, which, combined with the fact that the memory and chip are located above the slots, results in totally uninterrupted space for full-length cards in every slot, without obstruction from heatsinks. Even with every drive bay and slot occupied, the processor and SIMM slots remain visible, allowing for easy identification and expansion.

Hang on, what about all the drive cables? Sorted, thanks very much. The on-board floppy and PCI Enhanced IDE connectors are fitted to the top right edge of the board, next to the drive bays. No mess, and short cables allowing fast PIO Mode 4 performance from the 2.1Gb Seagate ST32140A hard disk. A Panasonic CR-583 eight-speed ATAPI CD-ROM drive is fitted to the secondary EIDE channel. The power supply connects to the board with a single plug and sucks in air to blow out over the chip and cards.

The 17in Ecoscan monitor has a maximum horizontal scanning frequency of 65kHz, capable of handling 1,024 x 768 non-interlaced at a high 80Hz refresh rate. It has a 407mm viewable diagonal, on-screen controls and looks good, if a little soft compared to the best models in this high mode.

In our tests the Evesham performed superbly thanks to a decent configuration and the large 32Mb memory. Build quality is exceptional. We *have* seen HX chipset boards with six SIMM slots, but this is a small point. Aspiring PC builders should get hold of one of Evesham's machines to see how it's done.

Gordon Laing



Evesham's HXSE 166 compared to Gateway's P5-166 Sovereign. Both are high-specced PCs, with Intel Pentium 166MHz chips and Matrox Millenium video. Notice the huge performance increase 32Mb EDO RAM offers over the 16Mb fitted to Gateway's machine.

PCW Summary

Evesham Micros Vale Platinum HXSE 166

Price £1,999 (plus VAT)
Contact Evesham Micros 01386 765500
Good Points Superb design and performance.
Bad Points Could be matched by most competent PC builders.
Conclusion A model PC-by-numbers.
★★★★

p79 ➢

Software

TextBridge Pro 96

Updated OCR package with more features and a simple interface.

TextBridge was a latecomer to the world of desktop OCR packages, a market that, in broad terms, was divided between OmniPage and WordScan. But its extremely low initial price, which was about a third or so below that of the competition, and its excellent recognition speed and accuracy, matched the fact that this program came from Xerox, a company whose name might just as well spell "document".

In other words, the program had to be a success, and the fact that it is now bundled with various scanner models, and is being continually updated and improved, is evidence of this success. Although the first version competed well with the top packages in terms of speed and accuracy, it lacked many of their features. This is no longer the case, even though the program seems to have kept its simple, even minimalist interface.

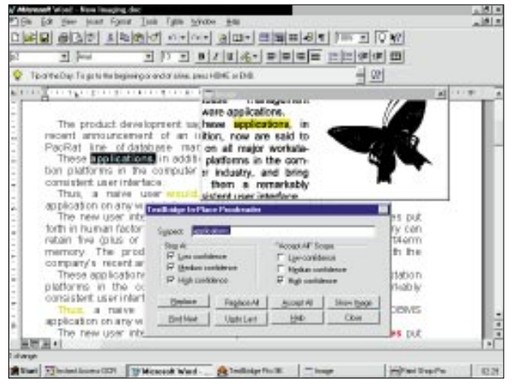
The version we had for review was Pro 96 for Windows 95 and NT. Like OmniPage, it supports a training mode, and like WordScan and TypeReader, it can cope with skewed images (up to ten degrees). The latest European version supports 11 languages: English, French, Italian, and German, Spanish, Portuguese, the Scandinavian tongues and Dutch (the US version supports only the first four).

The program now runs in 32-bit native mode in Windows 95 and Windows NT (not OS/2) and supports long filenames in Windows 95. In keeping with the times, and clearly trying to win a new market, it handles HTML (HyperText Markup Language) file formats, the standard for the web. It can output to HTML files, including Netscape and HotMetal formats, so you scan pages and import the converted text directly into your web browser. You also get HoTMetaL Light version 2.0 for editing HTML files.

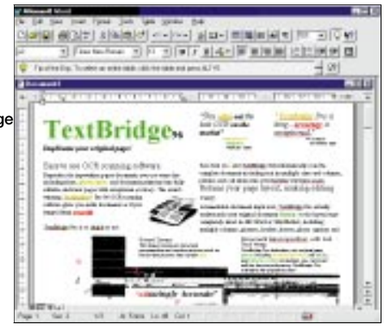
The program supports over 100 scanners and this includes the use of ISIS, TWAIN, and H-P AccuPage 2.0 drivers. ISIS is the acronym for Windows' scanner drivers provided by Pixel Translations, a number of which are provided as a standard part of the TextBridge Pro package. TWAIN is an industry standard that a number of manufacturers, including Xerox, are using to build their own scanner drivers, although the producers of most OCR software, including TextBridge, recommend not using this driver. H-P AccuPage, licensed by Hewlett-Packard, improves the combined performance of the H-P ScanJet scanner and TextBridge Pro.

Epson's Text Enhancement Technology, which lets you improve the readability of text captured from a paper document that has a screened or coloured background, is also supported. And so is Auto Area Segmentation which lets you scan text and images separately.

The so-called TextBridge Instant Access OCR enables you to run the program from within any Windows-based text application and import recognised data into an open document. If you do this from Word 2.x, 6.x or 7.0, or from WordPerfect 6.1, you have a page recomposition facility at your disposal as well. Page recomposition keeps columns, pictures, headers, footers, photo captions, tables with lines (cell tables) and more. If you run TextBridge Pro from within another text application and specify recomposition settings, the program will warn you that some formatting will be lost.



(Above) Textbridge's Proof Reader



(Right) TextBridge reconstructs a scanned page with all its formatting information in Word for Windows

An in-place proofer for Word 6.x and 7.0, and WordPerfect 6.1, gives you post-recognition proofing and editing. You can assign a confidence level depending on the original document quality and Textbridge highlights words which fall below this level. You can switch back to view the original scanned document at any time.

Xerox provides unlimited customer support to registered users. A manual in Acrobat format is on the CD-ROM. A printed one would cost you £10 and you don't really need it. In addition to the version we had for review, there's a Pro for Windows 3.1 and one for the Mac, and the original TextBridge (named Classic) which still sells for £99. There's a Unix product, too.

Panicos Georghiades and Gabriel Jacobs

PCW Summary

TextBridge Pro 96 (Win95/NT)

Price £349 (plus VAT)
Contact Xerox 01734 668421
Good Points Simple. Good value for money. Excellent page reconstruction.
Bad Points Nothing major.
Conclusion An excellent OCR choice if you use Word or WordPerfect.
★★★★

p81 ➢

Hardware

Epson Stylus Pro XL+

Phew! What a bargain for an A3 colour printer.

The Epson Stylus Pro XL+ is a colour inkjet printer with one major selling point: it prints on A3 paper. The original model has been around since last spring in the form of the Stylus Pro XL. The XL+ is the upgraded version: a four-colour model with two large cartridges, one of which is for black ink, another for Cyan, Magenta and Yellow.

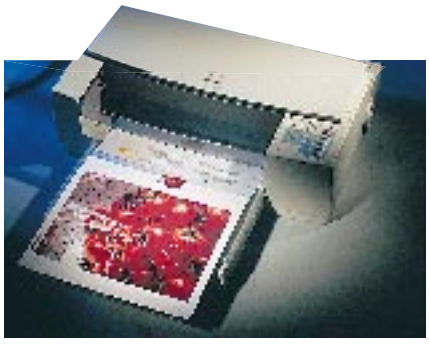
If you're familiar with other Epson printers, you'll find this printer easy to handle. Apart from the obvious design similarities across the range, many of the basic operations are the same, like installing a new cartridge or running the cleaning cycle.

A3 and A4 paper sizes fit into the front loading tray secured by sliding paper guides. An extra leaf must be pulled out for the A3 size to fit. This arrangement worked well under test and there were no paper-feeding or alignment problems.

New enhancements to the driver software have made the XL+ faster than its predecessor and the buffer size has been doubled, from 64Kb to 128Kb, to allow more efficient file handling. This also lived up to its marketing spiel with full-page A3 graphics files being processed in about four minutes at 360dpi, or about 15 minutes at 720dpi. The real speed test is for full-page A3 photographic images on high-gloss paper. These varied between 19 and 22 minutes, which was impressive considering the size and resolution of the result.

An enhanced colour correction module built in to the driver has improved output quality on this model, and full-page colour results were superb under test. Good results at high resolutions are still very dependent on paper quality and this makes running costs high.

Eleanor Turton-Hill



PCW Summary

Epson Stylus Pro XL+

Price £800 (plus VAT) on the street
Contact Epson 01442 61144
Good Points Much improved version of the XL. Amazingly low street price.
Bad Points Consumables are expensive: high-gloss A3 Epson paper costs £45 for ten sheets! Coated (720dpi) paper sells for around £25 for 100 sheets.
Conclusion Complete bargain. The only A3 colour printer for less than about £2,000.
★★★★

Hardware

Roland PMA-5

A mighty MIDI synth, sequencer and keyboard — all in the palm of your hand.

Rolph Harris began the trend for "music on the move" with his quirky Stylophone, back in the seventies. Roland's new Personal Music Assistant, or PMA-5, is a "Stylophone" for the nineties. It combines a General MIDI synthesiser, an eight-track sequencer and MIDI keyboard in a unit no bigger than a Filofax. On the side of the PMA-5 you'll find a port that lets you to connect it to a PC or notebook. It has standard MIDI ports around the back, so you can link it to your sound card to expand the range and quality of sounds for use in games and presentations.

The PMA-5 has a touch-sensitive screen for its user interface. Using the plastic-tipped pen, which you'll find slotted in the side of the case, you can access every feature the PMA-5 has to offer via Roland's most intuitive interface yet. The unit is designed to be held in one hand while the other does the tapping. The on-screen keyboard enables you to play any of its 306 sounds. It sends out MIDI information, allowing you to input data to a software-based sequencer, such as Logic Audio, reviewed on page 84.

The sounds, ranging from pianos to helicopters, outperform most current sound cards. Using the sequencer, you can record up to eight tracks of music. There's an intelligent auto-accompaniment section for you to jam along with.

The PMA-5 can be used as a stand-alone sound source, you can write tunes while you're travelling on the train, or you can download MIDI files to it, making it the world's smallest karaoke machine.

PCW Summary

Roland PMA-5

Price £445 (incl. VAT)
Contact Roland UK 01792 702701
Good Points It's loads of fun, looks great and has some very practical uses.
Bad Points No backlight makes it difficult to use in poor lighting conditions.
Conclusion The best gadget we've seen since the Psion 3.
★★★★

p82 ➢

Software

Scala Multimedia MM100

Versatile and interactive multimedia presentations.

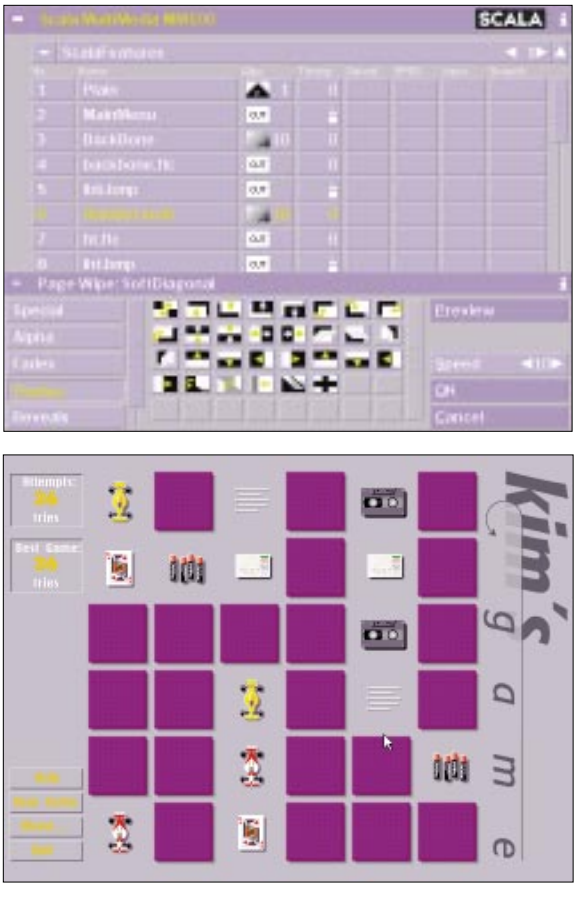
Scala MM100 is a new release (for DOS, Windows 3.x, Win95, NT and OS/2) of a product which originally débuted on the Commodore Amiga. Targeted at the business, home and education markets, it creates multimedia presentations. It combines graphics, animations, video clips and sound, with the option of interactivity.

Its strengths lie firmly in the area of presentation as opposed to the full-blown authoring provided by the likes of ToolBook, IconAuthor or Director. MM100 excels with screen-wipes and objects flying around the screen.

It uses its own operating system known as MMOS, which co-exists with other operating systems. This has advantages and disadvantages. One advantage is that it can speed things up because it accesses your multimedia hardware using its own drivers, as programs used to do in the days of MSDOS. What's more, a single installation enables you to run the program from DOS, Windows 3.1 or Windows 95, so applications will work in the same way under all three operating systems. You can develop in DOS and your application will run in Windows 3.x and Windows 95.

A major disadvantage is that if you have hardware which is not supported, you're stuck. Whether the MMOS approach arises from transferring the program from the Amiga to the PC or from a deliberate design decision, the result is that MM100 doesn't behave like your everyday Windows application. The interface looks different, you need to install a DOS mouse driver, and it doesn't use Windows MCI (Media Control Interface). You need to configure your SoundBlaster (or other hardware) specifically for the program.

However, MM100 is easy to use, even with its unusual interface. The design screen shows an empty list where you fill in the names of files that will appear on the various screens making up your presentation. These can be background bitmap files, sound files (digital audio, MIDI or CD-audio tracks) and MPEG files.



(Top) Scala's design screen, showing the wide range of screen effects

(Above) A memory game achieved by using Scala

You can define the way each screen (text or clip) will appear. There are 200 different, very smooth screen transitions and you can set their direction, speed and so on. Thumbnails of the various screens in your presentation are generated automatically. They look like a pack of cards and you can shuffle them using the mouse.

As for text, the program supports TrueType fonts; it has its own font format with fonts specifically designed for screen output and suitable for output to video. There are effects for shadow, outline and colour variations, and you can animate text in and out of the screen.

ScalaScipt is a script language which is automatically created by the interface. You can access the language to do advanced things but you needn't use it for standard presentations. You don't need to use it for Scala's variables and conditional branching, to make your presentation interactive. You can ask the viewer a question and use their answer to make a decision about what to do next, so MM100 can be used to create games, quizzes and training applications.

There's support for most of the industry-standard multimedia files: BMP, GIF, JPEG, PCX, PhotoCD, PNG and TIFF for stills, as well as MIDI and WAV, CD-audio, Autodesk FLC and FLI for animation, and MPEG for video. There's no support for Video for Windows or QuickTime, which is a substantial limitation. Even if you have a Pentium capable of software-only MPEG playback, MPEG support here is hardware dependent: no MPEG hardware, no digital video. Sound is well supported and there's fading, panning and a mixer for CD-audio, MIDI and digital audio if you wish to play all three types simultaneously.

The program is supplied on floppies and CD-ROM. The latter is packed with extras such as backgrounds, buttons, animations, sound effects, music in MIDI and digital-audio formats. There are fonts, animations, demonstration scripts, MPEG movies, cartoons and games. Minimum requirements are a 486/33 with 8Mb of RAM, and 10Mb of hard disk space.

Panicos Georghiades and Gabriel Jacobs ■

PCW Summary

Scala MM 100

Price £149 (incl. VAT)
Contact Scala UK 01920 484811
Good Points Platform independent. Rich in screen effects. Easy to use.
Bad Points Lacks software-only playback for digital video such as Video for Windows or QuickTime, and you need to check that your particular hardware is supported.
Conclusion Good performance, and very good value for money. Designed for TV-type presentations.
★★★★

p84 ➢

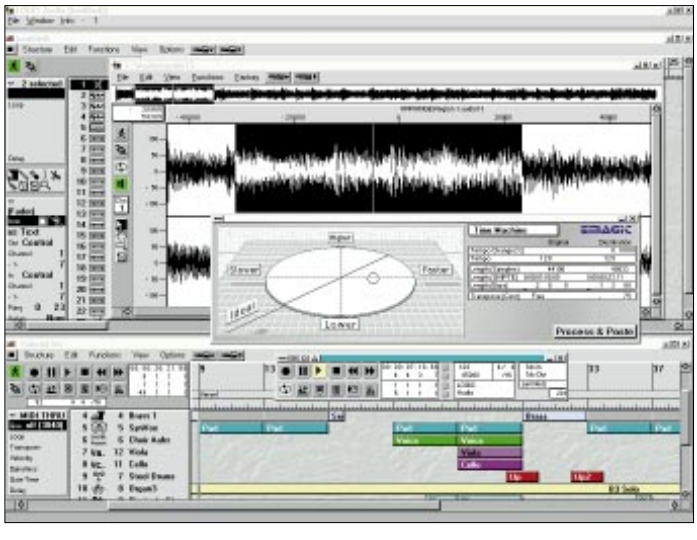
Software

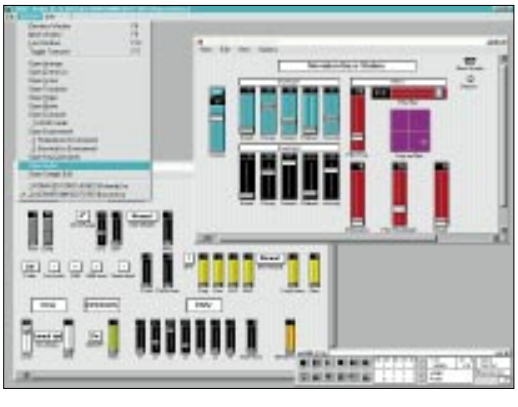
Emagic Logic Audio

A powerful, feature-stuffed sequencer. Not for the faint-hearted.

The Atari ST was an instant hit with the music fraternity due to its built-in MIDI ports which allowed instruments to be effortlessly connected. Two of the first applications on the scene were Steinberg's Pro-12 and Emagic's Creator; today, Cubase and Logic, as these apps are respectively known, are the most important in use in studios worldwide. Although the Atari ST is still considered a major platform for music production, more powerful PC and Mac systems are rapidly taking its place.

Mac systems are more prevalent in professional studios, while PCs are found mainly in project and home studios. This could all change in the near future as high-end software and hardware is developed for the PC. Emagic's Logic has been more successful on the Mac, while Cubase has had most success on the PC.





(Above) Any number and combination of windows may be viewed simultaneously

(Right) An environment set up to control synthesiser parameters

In this release of Logic, the integration of digital audio and support for Digidesign's professional AudioMedia III hardware are the most significant enhancements, making the PC more respectable as a professional sequencing platform.

Logic Audio is supplied on three floppies, with a 600-page manual and a copy-protection key that connects to either serial port. Logic works with any combination of Windows-compatible sound cards and MIDI interfaces. In addition to unlimited MIDI tracks, Logic can record and play back up to eight tracks of digital audio at 44.1kHz and 48kHz sampling rates. The integration of MIDI and audio is flawless. Both appear in the arrange window as objects, or parts, and both can be treated in the same way. Audio tracks can be moved, split up, copied, merged and edited in much the same way as MIDI parts.

Once a path has been set for audio files to be recorded to, you don't need to give each audio take a new name, even when beginning a new song. Audio can be recorded in mono or stereo but different sampling rates cannot be mixed within the same sequence. Stereo recordings occupy two of the eight tracks but are treated as a pair when being edited or moved around.

Double-clicking on an audio part opens the audio editor. Here, you can edit your audio files and accurately define start and end points for audio regions. New regions can be created from here. Most editing is non-destructive, which means the original recorded audio file isn't affected. Low-level editing, such as "normalising" a file, is destructive. Logic prompts you to create a backup before continuing.

All the standard audio editing tools are available, including fades, normalising and reverse, and there are some powerful features in the Factory drop-down menu. These include a sophisticated time-stretch and pitch-shifting utility, a silencer, and an energiser. The energiser is able to increase the perceived volume of a sample, even if it has been normalised, which is valuable when you need a "thin" sound to stand out in a heavy mix. Time-stretching lets you stretch the length of a sample, say a percussion loop, without affecting its pitch. The opposite of this, pitch-shifting, allows the pitch of a sample to be changed without altering its length, which is handy for correcting vocals. The silencer tool can remove unwanted noise, or clicks-in audio.

The most powerful tool in the Factory is the Groove Machine. It can take a sample like a drum loop and give it a swing or shuffle feel, and it works well. Before applying a new groove, it is important to loop the loop accurately. Logic is then able to calculate its tempo and where each beat occurs. Another good Logic trick is to analyse the groove of a sample and create a MIDI quantise groove from it.

Logic Audio has too many features to cover here. It would take months to fully appreciate it, but it is the most powerful and flexible sequencing package available.

Steven Helstrip

PCW Summary

Emagic Logic Audio for Windows 95

Price £399 (incl. VAT)
Contact Sound Technology 01462 480000
Good Points A truckload of features offers total integration with the most demanding studio.
Bad Points The over-complexity of Logic can be intimidating.
Conclusion Incredibly powerful sequencer. Not recommended for the beginner.

★★★★★

p87

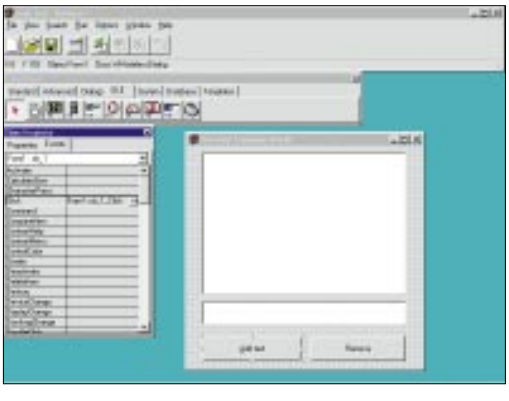
Software

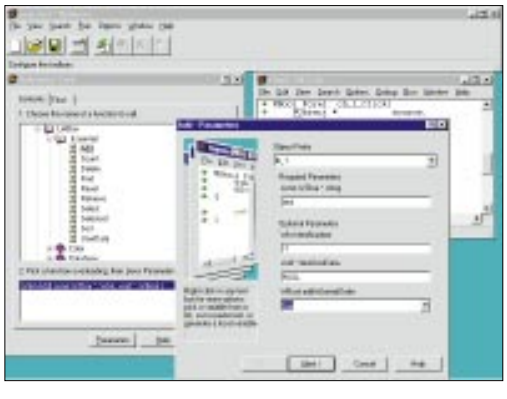
Optima ++

PowerSoft's new RAD tool is the easiest C++ yet.

A C++ compiler is nothing new and neither is Rapid Application Development (RAD), but put the two together and you have what developers have longed for since Visual Basic showed how easy Windows development could be. Many versions of Microsoft's Visual C++ have failed to address the issue.

Optima ++ provides a solution, mixing a VB-like development environment with a fully-fledged C++ compiler; namely, mixing the Watcom compiler with a new visual development environment. Bundled with it is the Watcom SQL database engine, revamped as Sybase SQL Anywhere.





(Above) It looks like Visual Basic or Delphi, but Optima uses the fast C++ language (Right) Optima's Reference Cards list member functions, let you set parameters, and insert the correct C++ code

The Optima ++ development environment is reminiscent of Visual Basic. New projects begin with a blank form and a palette of components like buttons and edit boxes, together with an object inspector that lists properties and events for a selected object. To write code for a button you choose the Click event, which opens a program editor with the correct C++ member function already defined. At this point, Optima goes one better than rivals with a feature called Reference Cards. If you want the button to change the text in a text box, drag the text box into the program editor and Optima presents a Reference Card, showing the functions of the textbook class in an outline view. A further button lets you set parameters, minimising the amount of code you must remember or type.

Sybase is a database company and Optima ++ has integrated database support using Open Database Connectivity (ODBC). The Developer edition comes with a standalone version of SQL Anywhere and drivers for flat-file databases including dBase and Paradox. Creating database applications is simplified by several components, including a data navigator, a transaction object and a query object. A query builder walks you through the creation of SQL queries and you can bind controls to database fields for quick completion of database applications. Everything is based on SQL, which is hard for those coming from a dBase background. The advantage is that scaling up to a full client-server installation is greatly simplified.

Behind Optima's RAD wizardry is a C++ class library, and PowerSoft has chosen to create a new one rather than use the standard Microsoft Foundation Classes. The decision may be for good technical reasons, but will make it harder to attract converts from Visual C++. It leaves PowerSoft vulnerable to the same problem Borland has with the Object Windows Library (OWL). It's a struggle to keep up with the latest features of Windows.

Optima ++ supports OCX controls. Several are supplied, including a calendar control. Others can be used by means of an OLE Component Wizard which generates the required classes and installs a new OCX onto the component palette. A similar approach is used to access OLE automation servers. The OLE support is client-only, since Optima does not currently provide an easy way in which to create OLE controls or automation servers. Advanced users will be glad to see classes supporting multi-threading. Apart from installing OLE controls, you cannot add new items to the component palette.

Optima compiles native executables for Windows 95 or NT, or for Win32s on 16-bit systems. This latter option limits you to a restricted set of features and the development environment runs only on 32-bit Windows, so 16-bit developers should look elsewhere. As with Visual C++, you choose between standalone executables or those which depend on a runtime DLL. In our tests, a simple application compiled to a 330Kb standalone executable, larger than the Delphi or Visual C++ equivalent but smaller and faster than a Visual Basic program with all its runtime files.

PowerSoft has announced two further versions of Optima. The Professional edition includes the PowerBuilder data window and net support including Java development and a three-user version of SQL Anywhere. It will let you build native components along with OLE automation servers. The Enterprise edition adds a version control manager and database drivers for leading client-server SQL databases like Sybase, Oracle and DB/2. Both versions will carry a much higher price than the entry-level Developer edition.

Tim Anderson

PCW Summary

Optima ++

Price £139 (plus VAT)
Contact Sybase/Powersoft 01494 555555
Good Points Genuine RAD with C++. Strong database features. Fast compiler.
Bad Points No MFC support. Cannot yet create native components.
Conclusion An ambitious product that nearly delivers. Already a capable development tool, future versions could challenge both Visual C++ and Delphi.

★★★★

Space and the Universe

Space, politics and the universe the DK way.

A galaxy of information for the space-crazy

The Eyewitness series has enhanced Dorling Kindersley's already excellent reputation, and the Encylopedia of Space and the Universe, is in that tradition. This title tries to cover a lot of ground in a simplistic way. Explaining space age technology and the politics surrounding it can drag you down, but DK has opted not to get deeply involved. The content is wide-ranging rather than comprehensive.

There are sections on the night sky, hardware, history, the space race, cosmology, and the universe. The information is well cross-referenced but is accessed via icons. Very little is linked with hypertext except glossary entries, which slows down your search.

The best sections allow the most interactivity. The "star dome" lets you specify the place, the month and the time of night from which to view the stars. You can pan around, and choose which elements of the sky you want to see. Home in on the zodiac stars and, as you move to a later hour, chart their progress across the sky.

This CD demands effort from the user to really get to the heart of the matter. It's all there, but it doesn't really grab you.

Adele Dyer ■

PCW Summary

The Encylopedia of Space and the Universe

Price £39.99 (incl. VAT)

Contact Dorling Kindersley 0171 753 3488

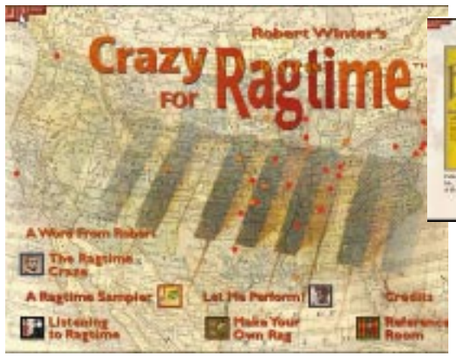
Conclusion Good as far as it goes, but a bit limited.

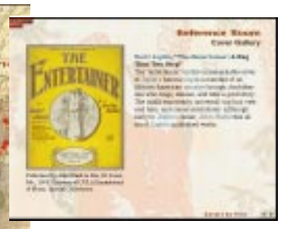
★★★

Crazy for Ragtime

It don't mean a thing if it ain't got that swing… but this has.

A book on the ragtime style of music describes it as "an instrumental work in 2/4 time, composed for the piano, that combines a syncopated series of melodies accompanied by an even, steady rhythm." This illustrates the trouble with books about music: unless you are a musician, a verbal description doesn't convey an awful lot. But the Crazy for Ragtime CD, with musical examples accompanying its descriptions, provides all the information you'll need to discover the ragtime genre.





Ragtime was the pop music of two decades

Robert Winter describes the two decades when ragtime ruled supreme as popular music. There's a good sample of ragtime music by Joplin and others, guides to the musicality of ragtime and to playing and singing it. There's a history of ragtime dancing, too. You can drop into a "reference room" to view photographs and short biographies of the major ragtime composers. There are pictures of the sheet music covers, and over 130 general and historical pictures. And there are 15 short movies ranging in time from 1896 to 1909. "Direct testimony" provides first-hand accounts of ragtime, and a bibliography. A glossary of words and phrases is continually available.

Crazy for Ragtime misses a few opportunities here and there and is overpriced at nearly 50 quid. It would have benefited from some hot-spot examples of minstrelsy and early "jass", too.

Paul Begg ■

PCW Summary

Crazy for Ragtime

Price £49.99 (incl. VAT)

Contact Macmillan Interactive Publishing 0345 697008

Conclusion Overpriced, but still recommended.

★★★★

Language-learning CDs

Yackety-yak — these talk back.

To coincide with the approach of the new school year, there has been a flurry of language-learning CDs aimed at everyone from the beginner to an advanced student.

Starting with the beginner's package, the Language Labs series from Europress teaches you a foreign language in much the same way as you learnt your native tongue. You see a series of pictures, with spoken and written words to accompany them. This way, although you don't translate anything, you do assimilate the meaning. You repeat words again and again, sometimes with one element or another removed: you could listen to a phrase and click the right picture; or have no picture, and listen and read instead.

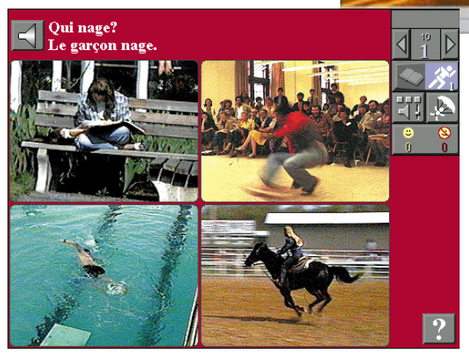
You get just far enough to pick up sentences in the present tense, nouns, adjectives, pronouns, questions and negatives. The vocabulary is limited and not very useful for anyone going abroad on holiday or business.

Right

Zut alors! French Now! will sharpen up your knowledge of French. There are five other languages, too, in the Transparent Language series

Below

Forget your Franglais and learn the lingo by ear, with Language Labs



The RealTime series from Macmillan is aimed at those with a rudimentary knowledge of the language who want to learn more vocabulary and grammar. The French version has a guide who leads you around each region of France, with its own grammar points and exercises.

The main part of each section consists of little dialogues. I couldn't get these to run, and there was no read-me file or other documentation to suggest possible remedies. However, the exercises that did work were very good.

The Linguamatch CDs are billed as interactive talking phrasebooks and are a good way of cramming vocabulary. There is a series of little cartoon scenes such as a town, a museum, an airport and a restaurant. You can click on each of the objects to hear the word spoken in French, and play games where you listen to a word and click the appropriate picture, or spell it out. There is a dictionary relating to each scene. The package is basic and limited, but is lively and good fun to play with.

Transparent Language's French Now! is aimed at those with a good knowledge of a foreign language but who want more of an insight. The main part includes articles from various journals: this is a good way to push yourself if you have gone beyond the "Janet and John" stage. Games include crosswords, rearranging sentences, and filling in missing words.

Adele Dyer ■

Below

Linguamatch is like a talking phrasebook

Bottom

Realtime French increases word power and sharpens up grammar (there's Spanish, too)

PCW Summary

Language CDs

French Now!

Price £89.99 (incl. VAT)

Contact Watford Electronics 01582 745555

Conclusion Excellent for advanced users. Languages available: French, German, Spanish, Italian, Latin, Russian.

★★★★

Language Labs

Price £19.99 (incl. VAT)

Contact Europress 01626 859333

Conclusion A good starting point. Languages available: English, German, French, Spanish.

★★★★

Linguamatch

Price £19.99 (incl. VAT)

Contact VCI Software 01923 255558

Conclusion Fun, cheap and useful. Languages available: French, German, Italian, Spanish, Russian.

★★★★★

RealTime French

Price £29.99 (incl. VAT)

Contact Macmillan Interactive Publishing 0345 697008

Conclusion Languages available: French, Spanish.

★★★

p90 ➢

Fundamentals of a Model Golf Swing

Fore! golfers who are teed off with a high handicap.

This CD claims to teach you the perfect golf swing. You'll need a lot of space for this, and the best place to run the program is on a portable computer out on the golf course, either at the practice tee or propping up the "19th hole"!

Fundamentals of a Model Swing (FoMS) won't teach you to "play" golf; it assumes you know how to do that already. It runs through all the usual instructions and drills on how to improve your timing and tempo, your swing, stance, grip, backswing, transition, top, downswing, impact, and the all-important follow-through. But apart from the multimedia help and frame-by-frame analysis, there's nothing here that you wouldn't learn from a few lessons with the Pro at your local club or from a good golfing book.

The screensaver that's definitely not golfing for dummies

FoMS includes Swing Maker for Windows. This is a separate program to generate your own screensaver in which a crash-dummy-type mannequin rehearses the ideal swing across the full range of clubs, and is based on composite photographic images of 54 PGA (Professional Golfers' Association) players. You can determine what operations will restart your normal screen (key-click, mouse, or password entry) yet still allow others to leave you on-screen messages if you're away.

You can control the speed and the order in which the clubs are played and concentrate on a particular part of your anatomy, displayed on-screen.

Ideal for casual players and golfing fanatics, Fundamentals of a Model Swing may well help you reduce your handicap without ever leaving the clubhouse.

James Taylor

PCW Summary

Fundamentals of a Model Swing

Price £29.95 (incl. VAT)

Contact Guildsoft 01752 895100

Conclusion A great way to improve your swing without having to move a muscle.

★★★★

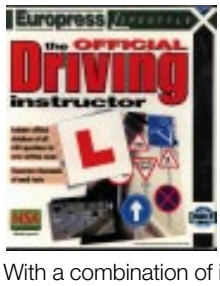
Question Master for Learner Drivers & The Official Driving Instructor

Nose to tail — two CDs to help you pass the written part of the driving test.

Feeling a bit nervous about sitting the written part of your driving test? If so, you might want to check out these nifty CD-ROMs. The Driver and Vehicle Licensing Agency (DVLA) now requires all learners to take a theory test before they get their licence, so would-be drivers are desperate to learn the correct answers. Two CD-ROMs have been specifically devised to help them.

Question Master for Learner Drivers (from Computech) and The Official Driving Instructor (from Europress) both cover the areas included in the theory test, ranging from alertness, to signs and signals. Both cover all the questions that the DVLA is likely to pose.

The Official Driving Instructor is more interactive and educational than Question Master and herein lies its strength. If you can forgive the cheesy background music, you'll find a wealth of driving information.



With a combination of interactive, dashboard-like menus and tutorial video clips, Driving Instructor shows you how to anticipate and handle difficult driving situations, from overtaking on a motorway to the hazard of children playing in the road. It includes a simulation test and extra information such as roadside first-aid and international road signs.

Question Master provides no tutorials or video sequences; it focuses on the test format and its questions. You learn by repetition but you can print out the questions and answers, which allows you to work away from your PC if you want. This is fine, but if you want to learn more, The Official Driving Instructor is the better choice.

Dylan Armbrust

PCW Summary

Question Master for Learner Drivers

Price £29.99 (incl. VAT)

Contact Open House Marketing 0161 833 8000

Conclusion Good for practising for the written test.

★★★

The Official Driving Instructor

Price £29.99 (incl. VAT)

Contact Europress 01625 859333

Conclusion An excellent all-round driving tutor.

★★★★

p92 ➢

Perfect Plants

Everything in the garden's lovely.

The first thing to strike you about Perfect Plants is its dazzling speed. It's refreshing to see a product that doesn't hang around. Launching the program brings up an introductory video from the author, Roger Phillips. You can press the escape key to skip past this to the contents screen. It has five sections: garden tours, ABC plant index, a plant searcher, a plant browser, and plant-care movies.

Garden tours contains six movies of different gardens around the world, including a Pacific Coast garden, a London Camellia garden and an English cottage garden. All have a commentary accompanied by music, much of which was composed specially for this CD. The Plant Care Movies section contains 35 practical videos on planting and training, propagating and pruning. The movies have been professionally shot and this shows in the quality: paradoxically, good-quality video compresses much better than something thrown together on a camcorder. At the end of the movies, a "view plants" button appears. Clicking on this brings up a screen with photographs and plant names.

There's a colour photograph of each of the 2,002 plants on the CD

The product's database contains detailed information and high-quality photographs of 2,300 plants. It lets you set 140 different criteria to search for plants to suit a particular area of your garden. From the Plant Searcher you can choose any one of the six main plant groups: shrub, bulb, climber, tree, perennial and annual. Narrow your search by choosing plant size, growing conditions, leaf and flower characteristics, and plant history.

The search criteria are incredibly detailed. You can search by any of 15 flower colours, six flowering times and five scent characteristics. A search of shrubs with red flowers native to North America, which like half-shade, quickly narrowed the search to just four plants. Clicking on one reveals a colour photograph of the plant on-screen. Icons at the bottom of the screen reveal information such as planting, rainfall required and size. You can view a plant description by clicking on the plant icon. Along the right-hand side of the screen, icons link to other plants in the same family.

Other features include "Shopping carts" which lets you create an electronic collection of plants (just as you would if you wandered around a garden centre) and then print out a list of those you want to buy. The browse feature runs a slideshow of plants, accompanied by music — about as near as a CD-ROM can get to the coffee-table-book experience.

Perfect Plants is one of the best CDs I've seen. It's a comprehensive plant reference that manages to be fun and easy to use. *(A Perfect Plants demo is on this month's cover-mounted CD-ROM).*

Ben Tisdall

PCW Summary

Perfect Plants

(See the demo on this month's CD-ROM)

Price £39.99 (incl. VAT)

Contact Macmillan Interactive Publishing 0345 697008; www.content.co.uk/perfectplants

Conclusion A must for any keen gardener who owns a PC.

★★★★★

The Adventures of Peter Rabbit and Benjamin Bunny

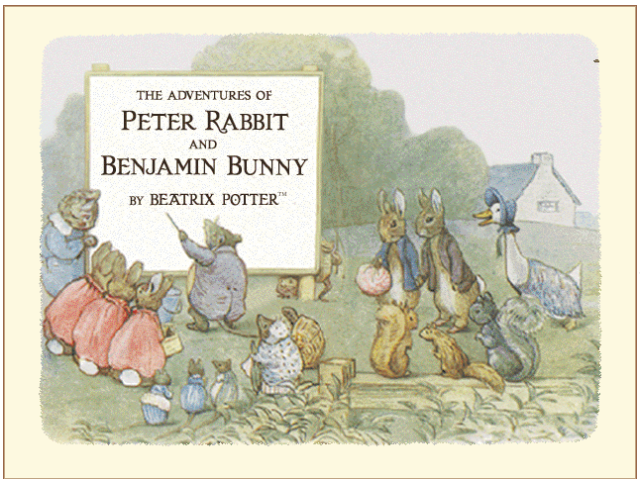
Peter Rabbit and friends are now on CD. Unfortunately, so's that nasty Mr McGregor.

Beatrix Potter must be turning in her grave — her sweet little books have been turned into an interactive extravaganza. Okay, slight exaggeration. What you actually get is two stories, thirteen nursery rhymes, a few puzzles and a "virtual explorascape" (the manufacturer's term for a 3D map). This CD is billed as being for three- to seven-year-olds, but Mindscape must have a strange idea of what will keep a seven-year-old amused. Tear them away from the TV and put them in front of this, and I think you'll have some extemely bored kids. Clicking on a tree in Mr McGregor's garden and watching birds fly out will only appeal to the younger age group. These younger children would, however, get something from this CD. It can help with learning to read, and exploring the garden will sharpen basic computer skills.

The graphics are pretty, delicate, pastel drawings which are reminiscent of the original book. The animation is sweet but a little sedate; the voices are sugary, like in BBC's "Watch With Mother", and the music is soothing. Younger children will probably enjoy listening to the stories of Peter and his friends and roaming around the garden discovering its surprises.

However, Ms Potter's legacy is safe. This sort of CD will never replace the original books. Children may be able to learn the nursery rhymes and listen to the stories but the real joy comes from a different sort of interaction. Call me old-fashioned and sloppy, but the imagination and magic conjured by a parent telling a bedtime story can't be beaten, however comforting the technology.

Janice Murray



The interface is so close to the original books that it barely makes a difference. Click forward or back — just don't upset Mr McGregor

PCW Summary

The Adventures of Peter Rabbit...

Price £tbc
Contact Mindscape 01444 246333
Good Points Improves reading and computer skills.
Bad Points Age range from another age.
Conclusion Hardly improves on the original books.
★★

Thomas Blue Eagle

An appealing look at the ways of the native Americans.

This beautifully-packaged CD tells the story of how Lakota, a native American boy, learns the ways of his ancestors — the buffalo-hunting tribes of North America. And your child will, too, if the style of animation appeals to them. For on Thomas Blue Eagle the animation is undoubtedly beautiful, and it's not surprising that this CD won an award for Best Visuals at a multimedia festival. But awards are given by adults, and the designers of Thomas Blue Eagle seem to have forgotten that kids need to have some fun as well.

The central part takes you into Thomas's teepee where there are plenty of objects to point and click, or you can settle down and listen to Blue Eagle's story. It's when you open the covers of Thomas's book that the animation comes to life, and images float across the page like ghosts. It's beautifully done. Kids can create their own native-style paintings and animated stories using genuine Indian words.

If you can drag them away from the Nintendo they might learn something from this CD, but I suspect that adults will appreciate its artistry a whole lot more.

Joe Young

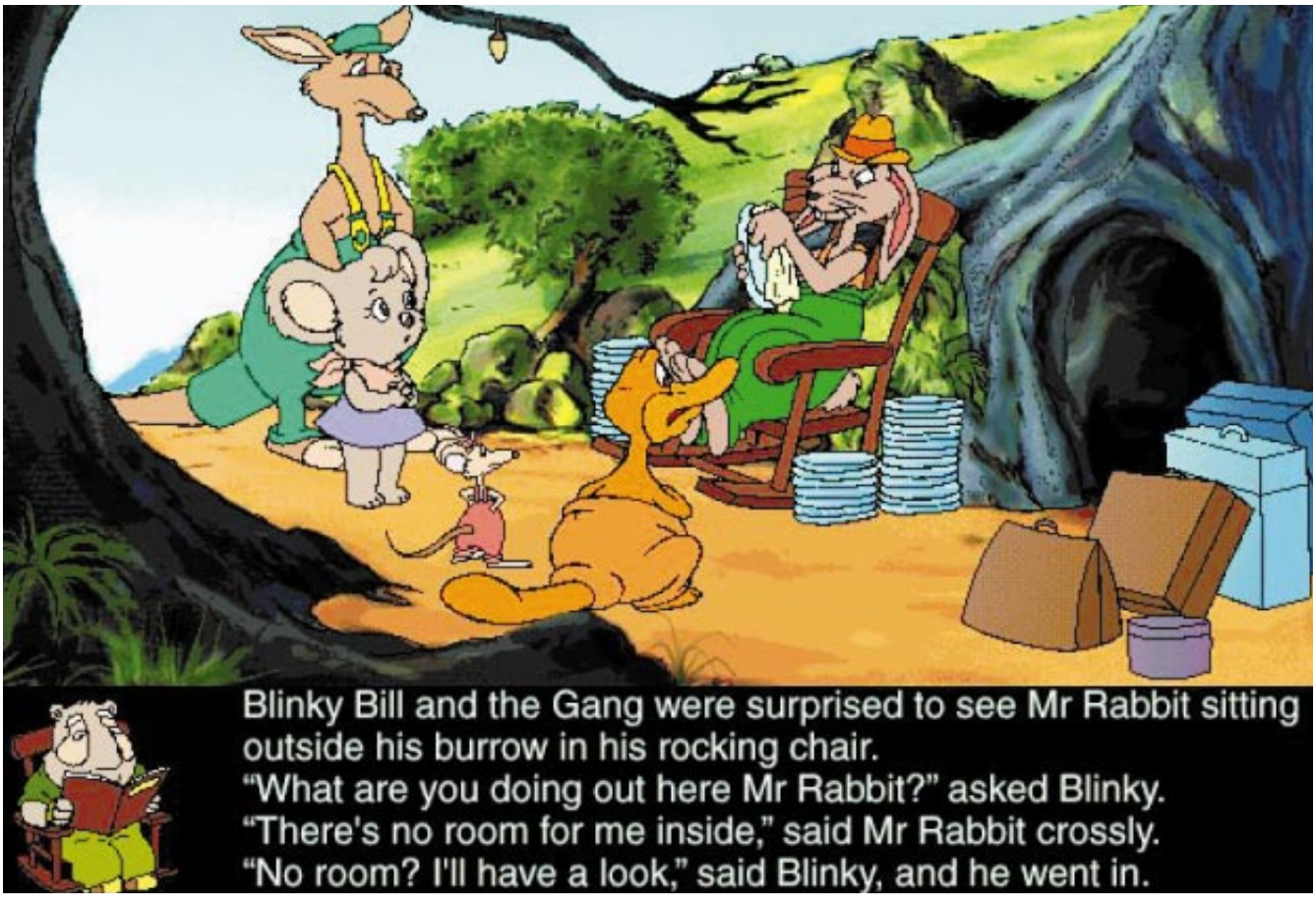
Native cave paintings tell their own story

PCW Summary

Thomas Blue Eagle

Price £24.99 (incl. VAT)
Contact YITM 0113 2461528
Good Points Original and resonant animation style.
Bad Points Perhaps a little too worthy overall.
Conclusion Some kids will be enchanted, others will just get bored.
★★★

p99 ➢



More than just a read-through, Blinky Bill contains a host of clickable surprises on each page

Blinky Bill's Ghost Cave

Go down under to meet Blinky Bill, read his story and play his game.

If you like Neighbours, you'll hate Blinky Bill. It has everything our favourite aussie programme hasn't: comedy, intellect, plot and lots of fun. This is a CD-ROM based around one of Blinky Bill's adventures. Blinky, if you don't know him from CBBC (Children's BBC), is a happy little koala bear with lots of friends and, in this case, a problem to solve.

The CD uses a great cartoon to tell its story. The colour is vibrant, the animation sleek, the voices chirpy and humorous. It has what every good cartoon should have, namely, scarey bits.

You can listen to the story or play the interactive version, where you can click things into action. Watch lizards dive, scorpions scatter and a spider play its web like a harp.

Once you've heard the story, there's plenty more to do. Select the palate in Mr Wombat's living room (he's the MC of the whole affair) and you will be transported to a

painting programme where you can colour in your favourite characters, move them about and give them silly hats. Select the puzzle from the living room, and the same characters fall to pieces and you have to reconstruct them.

There is some learning to be done as well as all the fun. You are able to highlight and read the story for yourself, and when you think you know the plot well enough, you can play the memory game. This little quiz tests you on things you have heard and seen in the story with the aid of eating ears and lots of encouragement. It's an enjoyable way of improving memory and comprehension.

If all that isn't enough to keep your children amused, they can sit down in front of Mr Wombat's slideshow where they can see pictures of real aussie wildlife. This may seem a bit worthy, but it is conducted in the same humourous manner.

Go out and buy this CD. It's a ripper, mate.

Janice Murray

PCW Summary

Blinky Bill's Ghost Cave

Price £29.99
Contact Anglia Multimedia 01603 615615
Good Points Humorous and educational.
Bad Points Nothing that springs to mind.
Conclusion You'll have to give a XXXX for this.
★★★★

p100

Fuzzy and Floppy: The Search For The Golden Bee

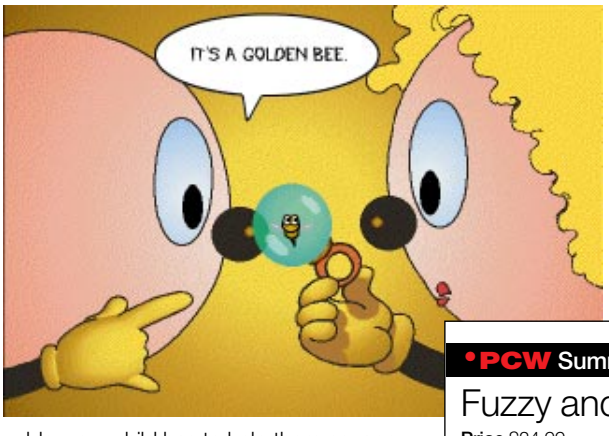
The evil Professor and his nasty sidekick steal a ring with a bee in it: help track them down.

Fuzzy and Floppy: The Search For The Golden Bee is an interactive problem-solving game for children aged from about seven years upwards. Created by Daniele Panebarco, a former strip-cartoonist who turned to multimedia titles in 1990, the artwork and music has considerable style and charm.

While helping their uncle clear and tidy his attic, Fuzzy and Floppy discover a ring which has a tiny glass sphere instead of a jewel. Inside the sphere is a golden bee. The evil Professor Hacker and his sidekick Zapo burst into the attic and steal the ring, believing that the golden bee will lead them to a hoard of gold. Fuzzy and Floppy set out to track down the thieves and recover the bee.

The concept behind Fuzzy and Floppy is quite clever. You follow their adventures just as you would in a traditional interactive storybook, but if they find themselves in trouble, your child has to help them escape. For example, when Professor Hacker and Zapo steal the ring, they lock Fuzzy and Floppy in a chest. Your child must find the key to let them out. The accompanying book has clues to help you. To add to the fun, the clues are in mirror writing!

Paul Begg



Fuzzy and Floppy investigate the Golden Bee, a ring with a sting in it. Follow the clues to help them find the evil Professor and get the ring back

PCW Summary

Fuzzy and Floppy...

Price £24.99

Contact Macmillan Interactive Publishing 0171 881 8000

Good Points More than just a game. Better than a purely educational title.

Bad Points You might get stung!

Conclusion Crazy name, great game.

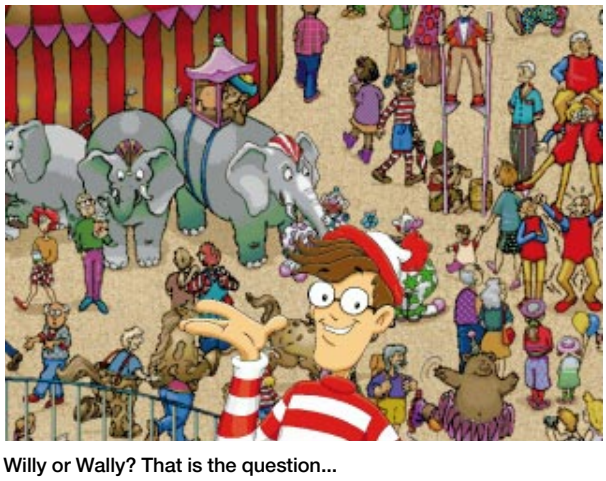
★★★★

Where's Wally At The Circus?

Not just hide-and-seek, Where's Wally includes stimulating games and puzzles.

The Where's Wally... series of books is a collection of large pictures full of people. Among them you have to find the character Wally, who is distinguished by his red-and-white striped jumper and matching bobble hat. This CD-ROM retains the fun of the books and adds a host of excellent problem-solving games. For example, there's a maths game to teach multiplication. You have to help Fearless Fred, the Lion Tamer, get his large cats to jump through hoops. You have seven numbered hoops and a pride of cats. You have to count the cats, then choose the hoop through which they can jump. If there are twenty-one cats, the hoop to choose would be hoop three or seven.

There are assorted other games to play, and you have to search for clues and puzzle pieces throughout, your task being to find the whistle needed to start the circus.



Willy or Wally? That is the question...

Wally offers highly stimulating games that are a cut above the average. There are nice characters like Arthur Minute, the bandleader, and Fearless Fred, who is really as timid as a church mouse. There are sufficient games to keep a child involved and the accents are British, which makes a nice change from the almost obligatory American. Overall, worth looking at.

Paul Begg

PCW Summary

Where's Wally At The Circus?

Price £29.99

Contact Time Warner Interactive 0171 391 4300

Good Points Problems are better than most.

Bad Points A little tough to get to grips with.

Conclusion Where's the next one?

★★★★

Long Term Tests

Hardware

1 YEAR TEST

Sharp PC-3000

A nicely designed portable PC with long battery life, suffering only from the built-in software.

I was interested to read Tim Bajarin's item about the NEC Libretto (*PCW*, July). It looks like it could be the ideal upgrade for my current Sharp PC-3000.

The PC-3000 resembles the box of one of those geometry sets with the set squares that you never used. It is a little too big to fit in a pocket, but at 8.7in long, 4.3in wide and weighing 1.4lbs there is plenty of room for it in a briefcase. It has 1Mb of RAM, serial, parallel and expansion bus ports and slots for two PCMCIA cards. The built-in ROM software consists of a file manager, address book, scheduler, text editor, spreadsheet, calculator, clock and "to do" list. There are also a small number of DOS utilities and a version of LapLink.

The good points are the keyboard and the battery life. The keyboard is excellent for the size of the computer, with good-sized keys and a nice touch. (I tend to make more errors when I revert to using a full-size keyboard.) Battery life is good. I haven't measured it exactly, but the "Main Battery Low" warning appears about every three to four weeks, with regular use. The machine uses three AA cells for normal use and data is safeguarded by a lithium button cell. Battery life is aided by the ability to instantly put the computer to sleep or wake it up at any stage using hotkeys, with no need for re-boots. Although the screen is clear under reasonable lighting, it is not backlit.

A negative aspect is the built-in ROM software which could be described, politely, as slow and clunky. The programs do work, but there's no fancy formatting such as underlining or italics. Additionally, the computer will only carry out limited task-switching by loading the separate programs on top of each other. Definitely no multitasking.

I use a 2Mb SRAM card in one of the PCMCIA slots with WordPerfect 5.1 squeezed on without the dictionary or thesaurus, which leaves plenty of room for data. I would strongly recommend getting the optional serial and parallel printer cables, particularly the former for file exchanges using LapLink.

The PC-3000 is the ideal shape and size for a portable PC and has a good battery life. I wish Sharp would make it faster and include a decent set of multitasking software, such as that built into the Psion 3a. I have tried the Psion. It's a lovely machine but I couldn't live with the keyboard. Now, this Libretto looks nice... If only it had a 30-hour battery life.

Angus Ross-Thomas

Was it a PDA? Was it a notebook? The late, lamented Sharp PC-3000

PCW Summary

Sharp PC-3000

Price (Now discontinued. Replaced with the Organiser series.)

Contact Sharp 0800 262958

Good Points Long battery life.

Bad Points Lacks good multitasking software.

Conclusion Nothing on the market to beat it.

★★★★★

p106 ➢

Software

1 YEAR TEST

Novell Groupwise version 4.1

This easy-to-use email package has a groupware feel to it and some useful built-in features.

My company entered the era of groupware computing in July last year almost as an afterthought. We had already made the decision to upgrade our desktop applications to Novell's PerfectOffice a few months earlier, which in turn led to our purchase of Groupwise Version 4.1, Novell's answer to Lotus Notes.

Its main function was to replace Da Vinci as our email application and it has been very successful; yet Groupwise is anything but a simple email package. It is made up of a number of small applets that range from a project planner to a desk calendar. Therefore, it has as much in common with a PIM, like Lotus Organiser, as it has with a package such as ccMail or Da Vinci.

For beginners, Groupwise includes an animated tour through all its features and how to use them. I am sure that most people could quickly learn how to use Groupwise: I certainly did and had no problems in swapping from Da Vinci.

The interface is user friendly and easy to customise should you so choose. It provides a number of email templates such as the "While you were out" message, and an appointment scheduler that most users will find helpful. Sophisticated features are provided, such as the ability to set rules on how Groupwise should react to a particular event. You can tell it to forward all messages to a colleague or even specify which sender's messages you want forwarded.

Additionally, there is the facility to automatically reply to an incoming message by sending back an appropriate email if you are in a meeting, on holiday, or otherwise engaged. However, this feature is not without its faults, as was discovered in my company a few months ago: a colleague who was about to depart for his holiday turned on his auto-reply function and, just prior to leaving, sent a message to all users informing them that he would be away. Someone in another department, who was also away, had turned on his auto-reply function as well. The result? You guessed it! Both users kept bouncing messages back and forth to each other until the network was inundated with email traffic. I am not sure whether Novell has dealt with this problem in the latest release of Groupwise, but if not, it ought to.

You are able to look directly into a colleague's mailbox and read their messages should you be so inclined. For obvious reasons, this particular feature can be disabled by the more security-conscious.

Of the other applets I found the Appointments Deskpad, the Notes Deskpad and the Tasks Deskpad most useful for my needs. They enable you to record tasks or appointments days, weeks, months, or even years in advance and will sound an alarm at the appropriate time. You will be reminded of tasks left undone, and can view entries in all three deskpads for an entire week, at the same time using Week View mode. When you switch to Day View mode, all appointments, tasks and notes for that particular day are shown together on one screen.

The Task Assigner enables you to delegate tasks to other users, and arranging appointments with colleagues is simplicity itself. A special template sends off the date, time, place and any accompanying message to everyone concerned, and each recipient can accept or decline the appointment. It is even possible to check, from your machine, whether or not a colleague is busy by checking entries in their appointment diary.

For the musically inclined, Groupwise provides a wide selection of tunes and sound effects to use as an alarm. It even allows you to compose your own tune by bringing up a keyboard on-screen, a feature which will no doubt appeal to all budding Beethovens.

I found Groupwise to be a big improvement on a standard email package, with many useful features and applications built in. I do not think it has made me drastically alter the way in which I work, but rather has helped me do the same things more efficiently. It is a good, solid package, and having used it for almost a year now, I can believe reports from Novell that it is selling well.

NA Nawab

Email project planner and desk calendar, all in one

PCW Summary

Novell Groupwise 4.1

Price SRP £480 (plus VAT) for five mailboxes

Contact Novell Customer Care 01344 724100

Good Points Easy-to-use email with good PIM features.

Bad Points The occasional quirk.

Conclusion An improvement on other email packages.

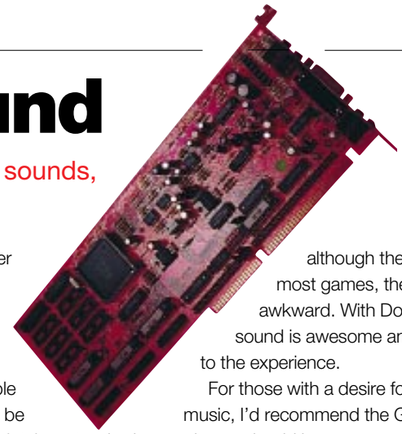
★★★★

Hardware

2 YEAR TEST

Gravis Ultrasound

Make high-quality music or enhance your game sounds, but beware of the limited on-board memory.



I am an amateur musician, and when the time came to upgrade my old 8-bit sound card I went for one which would aid composition. At the time, my available options were either the SoundBlaster 16 and its clones (all relying on old FM synthesis to generate sound), or a new wavetable synthesis card such as the Gravis Ultrasound (GUS). Wavetable synthesis uses recorded samples to generate sound, so, for instance, violins actually sound like violins. The card implements 16-channel MIDI in/out/thru via the separate adaptor.

Installation is simple. You select the address on the card using jumpers and the installation routine automatically chooses and tests the card settings. The bundled software is excellent. It includes Power Chords and Midisoft Recording Session for MIDI sequencing, Wave Lite for wave editing, and Patch Maker and Patch Manager to create and manage those sounds used by the GUS. Patch Manager enables multiple banks of instruments to be used, allowing me to maintain a standard general MIDI set, a set of old analogue synthesisers and various drum machines. Patches can be easily created from wave files with the Patch Maker, and many high-quality replacements and additional patches are freely available on the internet.

The GUS's most noteable drawback is the 256Kb of on-board memory which limits the number and complexity of patches that can be loaded at any one time. It should be increased to the maximum 1Mb at time of purchase. SoundBlaster support is supplied in software via one of two emulators, and although they work with most games, they can be awkward. With Doom, the 3D sound is awesome and certainly adds to the experience.

For those with a desire for good-quality music, I'd recommend the GUS. Game players should buy one anyway and add a cheap SB16 clone for problem games.

Alex Crookes

PCW Summary

Gravis Ultrasound

Price £159.99 (plus VAT)

Contact Koch 01420 541880

Good Points Excellent bundled software.

Bad Points Some games can be troublesome.

Conclusion Buy the maximum amount of RAM.

★★★★

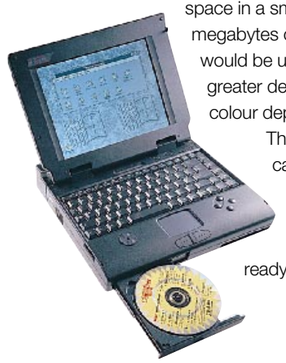
Hardware

6 MONTH TEST

Hi-Grade Notino P75M

A capable notebook but it could do with more RAM, longer battery life and a better joystick.

My Hi-Grade Notino P75M arrived last January. I hadn't bought it — it was a *PCW* competition prize! The Notino's keyboard is comfortable despite its thickness and non-standard layout. The 11.3in dual-scan screen feels almost as large as my old 14in monitor, and its 800 x 600 resolution packs plenty of space in a small area. Two megabytes of video RAM would be useful for greater definition or colour depth.



The Notino came with all its basic operating software ready to run, and worked "out of the box".

Although Win95 works efficiently with 8Mb of RAM, it sometimes feels no quicker than my old 386SX. The CPU is impressively fast but the interface still lumbers along, and printing documents at high resolution reduces the machine to a crawl.

Battery life is only 30 minutes, but this is sufficient to dial up email or print out a document without plugging in. It has a dual-speed CD-ROM, a joystick and MIDI/games port. The supplied joystick is difficult to use and an external model needs a proprietory adaptor. I bought a PS/2 mouse for comfort, as Hi-Grade provides an adaptor to fit mouse and keyboard in the single PS/2 socket. The trackpad is reliable and effective.

A lot of power has been built into a box the size of a large telephone directory, but then, I don't need a compact machine. Despite the pace of technological advance, my Notino does all I want and takes up little space. Nothing has broken or worked loose and there is nothing more I really need — except another 8Mb of RAM.

Mark Winston

PCW Summary

Hi-Grade Notino P75M

Price £1,980 (plus VAT) for current spec

Contact Hi-Grade 0181 532 6123

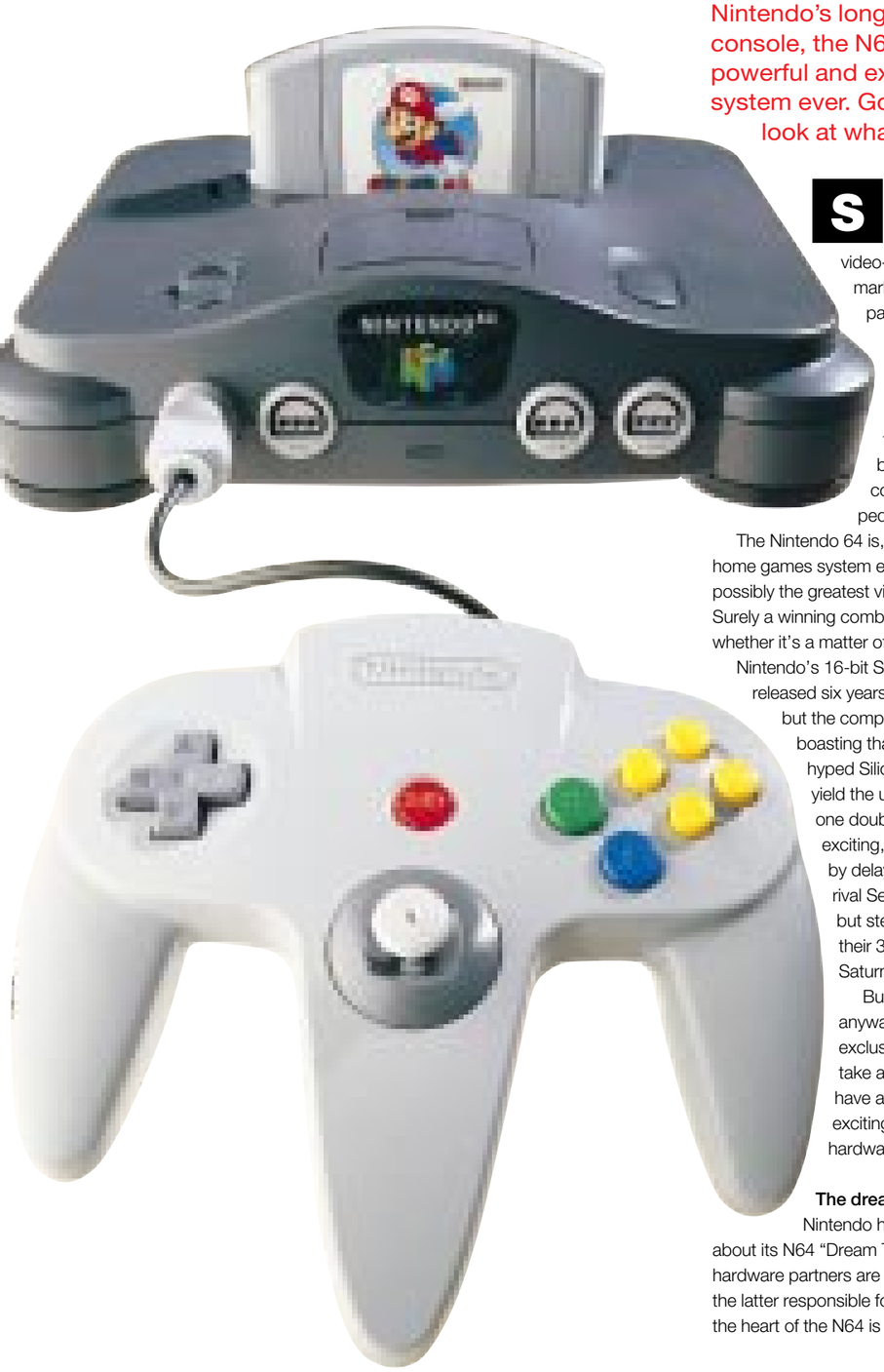
Good Points Well set up. Comfortable to use. Capable.

Bad Points Size. Joystick. Battery life.

Conclusion A competent workhorse.

★★★★

The power game



Nintendo's long-awaited 64-bit console, the N64, is the most powerful and exciting home games system ever. Gordon Laing takes a look at what all the fuss is about.

Sunday 23rd June, 1996: Nintendo finally releases it's long-awaited 64-bit cartridge-based video-games console to the Japanese market. The customers are literally panting with anticipation. By the end of the day, sales of over a quarter of a million units are reported. By the time you read this, Nintendo expects to have shifted no less than 1.5 million units. Impressive, but not surprising when you consider the N64's background and pedigree.

The Nintendo 64 is, without doubt, the most powerful home games system ever and makes its début with possibly the greatest video game of all time: Mario 64. Surely a winning combination, but the big question is whether it's a matter of too much, too late?

Nintendo's 16-bit Super NES (SNES) console released six years ago was an enormous success but the company skipped the 32-bit platform, boasting that its relationship with the much-hyped Silicon Graphics company would yield the ultimate 64-bit games console. No-one doubted the collaboration was exciting, but the final product was plagued by delays. In the meantime, established rival Sega and newcomer Sony slowly but steadily gained market share with their 32-bit CD-based games consoles, Saturn and Playstation.

But what is all the fuss about anyway? *PCW* visited Nintendo's exclusive UK distributor, THE Games, to take a look, take apart and generally have a great deal of fun with the most exciting piece of home video gaming hardware to date.

The dream team

Nintendo has justifiably made a big noise about its N64 "Dream Team" partner list. Nintendo's hardware partners are Silicon Graphics and Rambus Inc, the latter responsible for high-speed memory. Powering the heart of the N64 is Silicon Graphics' Reality Immersion technology, consisting of a custom version of the MIPS 64-bit R4300*i* RISC processor, a MIPS Reality co-processor and an embedded software layer.

The customised MIPS R4300i RISC processor is manufactured by NEC, features a five-stage pipeline for enhanced media processing and runs at a clock speed of 93.75MHz. The MIPS Reality co-processor (RCP) designed specifically for Nintendo by Silicon Graphics, incorporates processors for sound, graphics and pixel drawing and runs at 62.5MHz. Its features include gourad shading (to render polygons with smoothly-changing surface colours), realtime anti-aliasing (to smooth pixellated edges), advanced texture mapping (to retain natural-looking textures regardless of distance), z-buffering and realtime depth buffering (to calculate distances and remove hidden surfaces during 3D rendering). The processor and co-processor together boast over four million transistors.

To sound more impressive, most console manufacturers talk in terms of megabits, of which there are eight in a familiar megabyte. The N64 features 36Mbits (that's 4Mb) of DRAM. Of far more interest is Nintendo's decision to stick with cartridge-based games, typically measuring 64Mbits (8Mb) each.

Sega, Sony and the PC have virtually standardised on the CD, boasting cheap duplication and a huge 650Mb capacity. Nintendo is quick to point out that CD-based systems are slow to start up, while cartridges are ready to go the instant you power up. Silicon is pricey though, so you're unlikely to see many video clips on N64 games. However, anyone doubting the scope of a machine with 4Mb of RAM and a mere 8Mb of ROM games should check out Mario 64 and prepare to be amazed.

To cover itself, though, Nintendo has announced a forthcoming magneto-optical disc drive, called the 64DD, which sits as a base under the N64. It uses proprietary rewritable 3.75in discs with 64Mb capacity, a claimed 1Mb/sec sustained data transfer rate and 150ms average seek time. It will be sold with a 1Mb or 2Mb RAM expansion pack. The 64DD is scheduled to be unveiled this autumn in Japan, at a rumoured cost of around $100.

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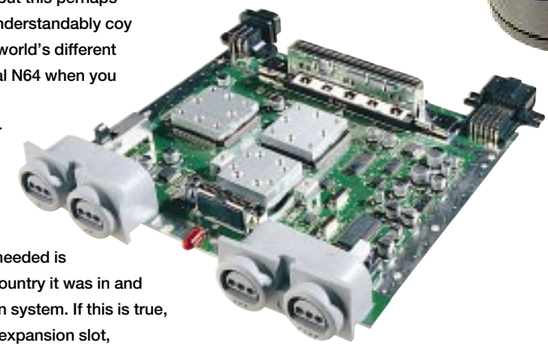
Nintendo 64 laid bare

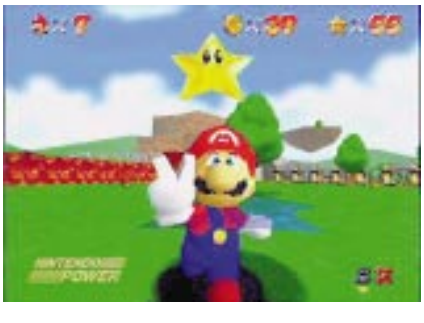


The Nintendo 64 bared for all to see. The small, neat and perfectly formed N64 motherboard is dominated by three large chips, measuring about 3cm on each side. The heatsinks could not be removed so we're guessing when we say that one is the custom version of MIPS' 64-bit R4300i RISC processor, another is the MIPS Reality co-processor, while the third (or a discrete chip on the far right) could be Rambus's 4Mb DRAM memory technology. The motherboard components run on either 12v or 3.3v, the latter perhaps implying some sort of modified Pentium technology.

The large slot at the rear is for the cartridges, while the shorter slot at the front takes the forthcoming RAM expansion packs, initially to be sold with the optional 64DD magneto-optical drive which connects to a slot on the underside. Also notice the four controller sockets at the front, power socket rear left and video output rear right.

Interestingly, the Japanese N64 comes with an unidentifiable card already fitted into the memory expansion slot and has "do not remove" written all over it: if you do remove it, the N64 doesn't operate, but this perhaps provides a clue to localisation of units. Nintendo is understandably coy about the difference between units designed for the world's different television systems: why wait for your country's official N64 when you could buy an import and modify it today?

The US and Japanese SNES consoles used different-shaped cartridges than the UK SNES, immediately conferring physical incompatibility. However, it is believed that N64 units and cartridges will be physically identical the world over, thereby saving manufacturing costs for Nintendo. All that would be needed is some slot-in device which would tell the unit which country it was in and then automatically switch itself to a suitable television system. If this is true, and we're only guessing, one could use the memory expansion slot, occupied as standard by a tell-tale mystery card, or perhaps even the removable power supply which docks in the rear of the N64.



A taster of the N64 games, from top: cruising in PilotWings 64; four-player action with MarioKart 64; Doom-style Goldeneye; and the remarkable 3D cartoon world of Mario 64

The N64's controller is a remarkable piece of hardware in its own right. There's a conventional 8-way joypad with ten buttons dotted around the unusually comfortable surface and, uniquely, an analogue joystick slap bang in the middle. In Mario 64, it is the primary means of control. Push it a little and Mario walks. Push it further and he gradually increases speed until he's really legging it.

Sega has an optional analogue controller and Sony's can't be far away, but Nintendo's is standard from day one. Better still is Nintendo's provision for four controllers, bringing a new dimension into multi-player games, such as the forthcoming MarioKart 64.

The N64 works at screen resolutions between 256 x 224 and 640 x 480 pixels, with most titles opting for the normal mode of 320 x 240. Thirty-two bits per pixel offers 24 bits of RGB colour plus an 8-bit alpha channel for transparency. Sound details were sketchy as we went to press but the N64 supports General MIDI.

In Japan the N64 is sold without a video cable but is compatible with those for the SNES. The highest quality SNES RGB video cable can get around NTSC problems on some PAL television sets, but sadly does not work with the N64, perhaps to discourage import. Those seeking the best quality can only hope that Nintendo has changed the RGB pin-outs rather than removing them altogether. An RF module, for those who want to connect to their TV aeriel sockets, should be an optional extra.

Going to market

Nintendo plans to have manufactured five million units by the end of next March and is expected to pump 3.4 million of them into Japan, with the remaining 1.6 million going to the US. Consequently, it looks highly unlikely that we'll see UK 50Hz PAL Nintendo 64s, at least in volume, before Easter 1997. Also, consider that Nintendo only intends to supply half a million units at $250 each to the US before Christmas, accompanied by a $54m marketing campaign. Do the sums for that and you've got a marketing budget of $100 per $250 unit sold in the US. The Americans will be so hyped they won't be able to help themselves from snapping up their share, leaving few spare for exporting to us poor, neglected Brits.

Nintendo is clearly confident that hardcore fans won't mind waiting that bit longer. But the mass-market, requiring a present for their kids at Christmas may plump for a Saturn or Playstation instead, especially since both 32-bit consoles are currently available for £199, with plenty of software already out and the strong possibility of further price reductions.

Japan has had to make do with only two games at launch: Mario 64 and PilotWings 64. By the time we get UK N64s, we should have access to the 20 or so games planned for launch during the next year. We're assured of quality rather than quantity, but many, shall we say, *parental* buyers will see the limited range of titles as a turn-off. Couple this with the fact that an N64, plus game, approaches double the price of a Saturn or Playstation with game, and you can see that Nintendo may have a problem on its hands.

UK pricing is not set in stone, but hardware usually comes across at an even dollar-to-pound ratio, meaning we're looking at around £250 for the unit alone. Software is a little more promising, with typical $79 cartridges coming in at around £49.99. If you can't wait, you might consider buying a Japanese import today or a US import when the models become available. Specialist games stores are selling Japanese N64s with Mario 64 for around £700 but you'll have to put up with Japanese text and, more importantly, you'll need a TV or monitor capable of accepting a 60Hz NTSC signal. Also bear in mind that THE Games, Nintendo's UK distributor, will not support imported consoles.

Quality vs quantity

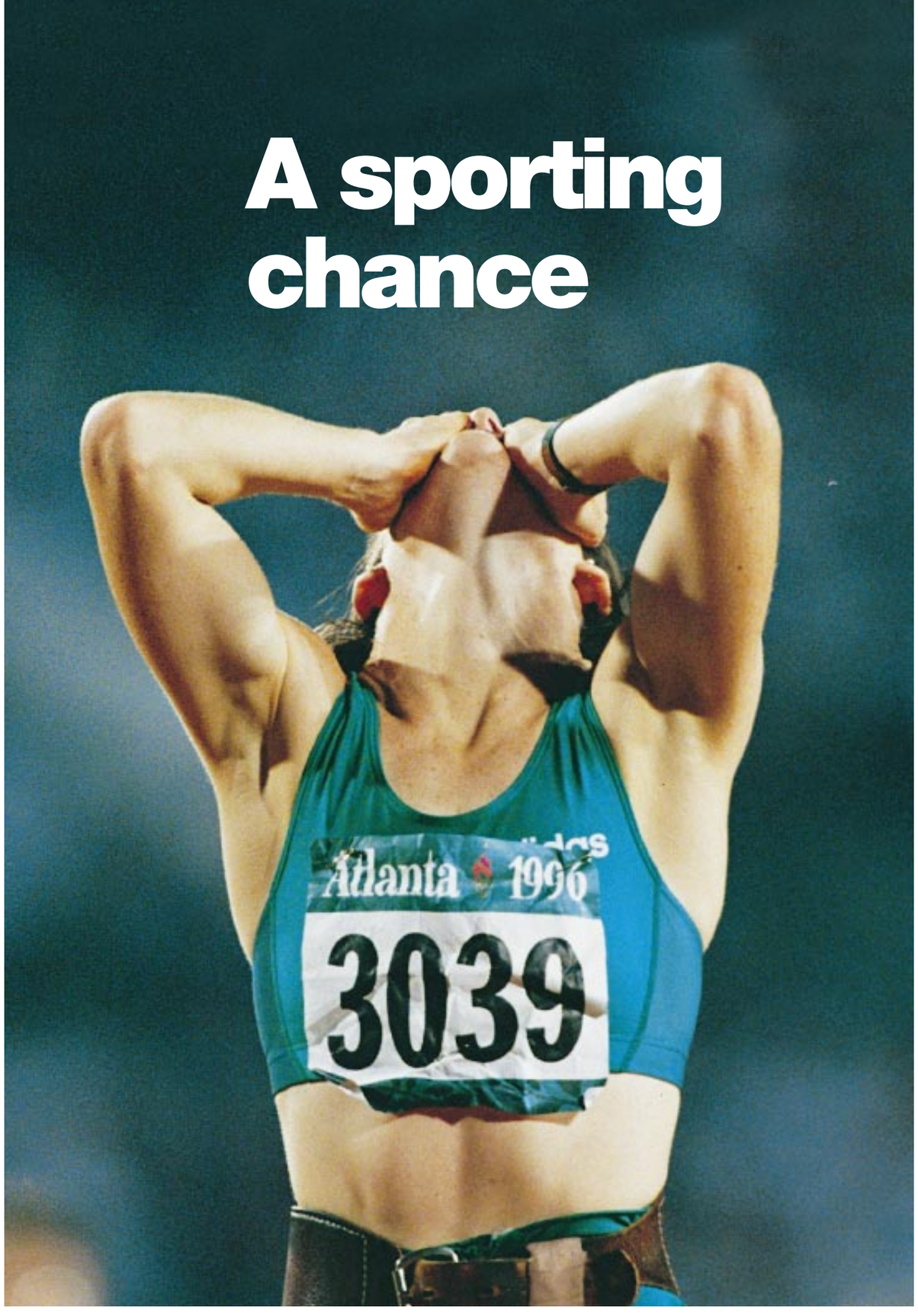
The Nintendo 64 is, undeniably, an impressive piece of hardware easily beating all competition in terms of raw performance. Mario 64 knocks other 3D video games, Doom, Descent and Quake included, into a cocked hat; but can this standard be maintained?

Nintendo has a policy of quality rather than quantity but even so, Nintendo's chairman, Hiroshi Yamauchi, admitted that if only three of the company's games released this year came close to the quality of Mario 64, it would be fortunate.

Many games developers have become comfortable with the low cost of CDs and may be reluctant to make the move to pricey cartridges, but Nintendo's confirmed software dream team should at least ensure a supply of decent titles. The team lead by the legendary Shigaru Miyamoto, the man responsible for every leading Mario game, is exclusively working on N64 and 64DD titles. If you want his games the N64 is the only platform to go for. But unless you're prepared to pay the high cost of importing a foreign N64, you're going to have to wait.

THE Games 01703 653377 ■

A sporting chance



Sports sponsorship is ideal for IT companies to showcase new technology. Set against the background of the Olympics and Euro 96, 'Match of the Day' was IBM *vs* Microsoft. Ben Tisdall had a seat in the stand.

Old rivals IBM and Microsoft are locked in combat again. This time the battle is not the traditional fight between OS/2 and Windows, but a battle for domination of sports sponsorship. Microsoft fired the first salvo with its sponsorship deal to deliver most of the software technology behind Euro 96. IBM then hit back with its own Olympics offensive. It went one better than Microsoft by supplying the entire internet solution from end to end: hardware and software.

Sports events can be brilliant for IT companies because the infrastructures they require are on a par with the largest corporations. And because they're usually start-up greenfield sites, they are an ideal way to showcase new technology.

Unfortunately, as IBM can attest, when things go wrong you're likely to generate vast quantities of bad publicity. There were 15,000 journalists at the Olympics, all looking for stories. When the results from some events were delayed, the bad publicity didn't take long to appear.

Euro 96

The four computer sponsors were Sema Group, Microsoft, Digital and BT. Digital supplied PC desktops, NT servers and Alpha servers, while BT took care of the ISDN technology to link them all.

Euro 96 involved 16 teams playing in eight different cities. Every location needed to receive realtime match information and to access information held at any of the other sites.

Sema Group developed the main applications, building on its experience from the Barcelona Olympics, while Microsoft provided the network and data architecture using its Back Office products. Windows NT Advanced Server was the operating system, and SQL Server supplied the distributed database capability. Exchange was used to provide the email capability.

It wasn't possible to have all the data in a single location so the replication capability of SQL Server was used to minimise traffic. This also helped reduce the ISDN charges. Microsoft used a central hub approach. Rather than each venue replicating its data to all the other sites, they each replicated to the central hub which then forwarded the data.

This had a couple of advantages. Firstly, only the hub required high ISDN bandwidth (two ISDN30 lines in total). Secondly, all the data was stored on an Alpha server so that it could be backed up. The central site also provided the NT Primary Domain Controller (PDC) and allowed monitoring and management of network performance. All 50 LANs combined to make a single NT domain with every server additionally acting as a Backup Domain Controller (BDC).

Microsoft claims that SQL Server is the best-performing relational database platform for NT: well, Microsoft *would* say that, and state that if it had used Oracle7 instead, the company might have had problems with performance and with the replication.

The applications supplied by Sema were operational and informational systems. On the operations side: VIP management (looking after the celebs and VIPs visiting Euro 96, materials management (keeping track of everything from balls to mobile phones), volunteer management (looking after the 1,000 volunteers) and accreditation, which is the registration of all participants in the championship and the provision of security badges.

On the information side there was the results system, which took match statistics such as territorial advantage, corners and shots on target from spotters in the stadium and distributed them to local outside broadcast units. And the intra/internet systems. These provided detailed results in web format for intranet use by journalists in the press room, and internet access by fans with an internet connection.

Every major sporting event from now on will have a big web site, and Euro 96 was no exception. As well as providing up-to-date information while matches were taking place, the Euro96 site also had a personalisation feature. This meant that first-time visitors could choose favourite teams and players and be updated later on how their favourites were faring.

Although Microsoft had some problems on the first

Gazza celebrated while Sema and Microsoft kept score

PHOTOGRAPHS: ALLSPORT

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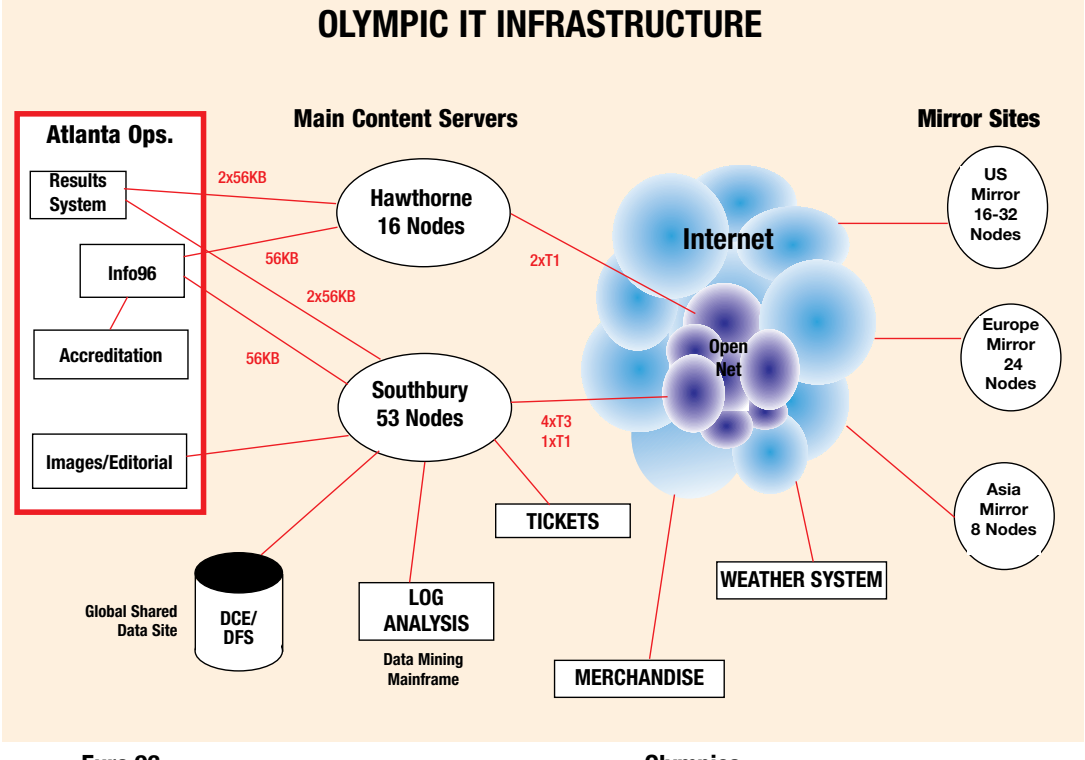
The sponsorship scoreboard



	Euro 96	Olympics
	Microsoft, Digital, Sema, BT	IBM, Xerox, Motorola, AT&T
	6,000 media representatives	15,000 media representatives
	2,000 staff and players 71,000 employees and volunteers	15,000 athletes
	1.4 million ticket holders	Millions of tickets
	16 million web site hits Over one million hits on the busiest day	187 million web site hits 16.95 million hits on the busiest day.

day, the system ran smoothly thereafter. It coped with a total of 16 million web hits during the three weeks of the competition.

The Olympics

While Euro 96 was in full swing, IBM was putting the finishing touches to its vast IBM IT infrastructure. The Olympics has been compared to running the world's largest chain of restaurants and hotels while simultaneously putting on two superbowls every day for 17 days. The scale of it dwarfs Euro 96, and IBM's contribution to the event was valued at $40m.

IBM was in the unique position of being able to provide a complete end-to-end solution using all its own hardware, software and networking capabilities. Some other companies also contributed: Swatch (timekeeping), Xerox (printers), Motorola (pagers) and AT&T (telecommunications). The system was modelled on a huge corporation of 150,000 users on-site with millions of customers worldwide who needed to access information.

During the games, IBM systems were installed at over 30 interconnected venues. A staggering three terabytes of data collected during accreditation, games management and scoring were passed through 7,000 PCs, 250 lans, 500 data lines and 2,000 wireless computers. Behind the scenes, 80 AS/400s and four S/390 mainframes also played a part.

Because most of the 150,000 users had little or no computer experience, the applications were designed to be easy to use and in some cases used touch-screens. There were three main applications: the results system, Info 96, and the WWW home page.

The results system was designed to share competition results between different IBM platforms. Info

p120 ➢

The results system used by IBM at the Olympics generally worked well, although distribution of data to twelve different news organisations threw up the occasional hassle

96 was a touch-screen interactive system available on 1,800 kiosks dotted around the venues. It was designed to inform VIPs, journalists, athletes and officials of event schedules, transport and weather reports. Info 96 was also used to send and receive electronic mail and post messages on bulletin boards. The system behind Info 96 was an IBM S/390 running IBM's DB2 database software which supplied data to an AS/400. This in turn fed 30 AS/400s on the various sites.

It's in the net

Atlanta was the first Olympics to have a web site and it was a massive one. It included competition schedules, ticket information, starting line-ups and results, weather, video clips and on-line shopping for tickets. By March, the site was already receiving 90,000 hits a day and this rocketed to nearly 17 million hits on the busiest day of the games. It beat IBM's projection of ten million hits but was nevertheless well short of the 100 million hits per day with which IBM claimed the system could theoretically cope. A total of 130,000 tickets were sold on the web site, generating over $5.3m revenue. Twelve percent of tickets were sold over the internet, making the official Olympics web site, for a short time, the biggest centre of electronic commerce on the net.

IBM produced an internet program, called Fanmail, for the games. It allowed web users to send messages and questions to athletes, either to teams or individuals. It also allowed users to make donations to UNICEF's "Olympic Aid — Atlanta", the games' official charity.

To put the infrastructure together, IBM provided more than 200 people to work with ACOG employees (the Atlanta Committee for the Olympic Games) to develop the system. Like many companies, ACOG adopted a three-tier client/server architecture. Linking the client and server layers were various types of middleware: the DB2 database family, the customer information control system (CICs) transaction monitor for heavy-duty processing of scores, data and badging requests. Two message queuing products were used to manage delivery of the information.

For WAN (wide area network) communications, IBM used BellSouth and AT&T frame relay network. The entire network was managed from a separate site using IBM's NetView and SystemView Series. Backup was provided by two remote S/390 Enterprise Servers. An SP2 super-computer acted as the WWW server.

In practice most of the systems worked well, but IBM did have hassles with the distribution of results to 12 international news organisations. Agencies like Reuters and AP (Associated Press) reported problems, plus there were delays getting results onto the 1,800 Info 96 kiosks

IBM states that the problem was largely due to the venue managers, as it was up to them when results were posted. There was also a measure of bureaucracy which affected the timing of the release of official results. For example, in the men's marathon the first competitor finished in 2hrs 12mins, yet the results weren't permitted to be put on the system until the last competitor had dragged himself over the finish line 4hrs 49mins after leaving the start. Similarly with the canoe and kayak slalom, there is apparently a mandatory 30-minute waiting period to allow for protests before the results can be posted.

To some extent the problem is the medium. It's difficult for Olympic officialdom to grasp that newswires and the World Wide Web now need to operate in real time and must be able to post results as quickly as television. IBM promises that for Sydney in 2000, it will find a way of getting preliminary results up quicker. ■

Which web editor?

GARRY HUNTER

Nigel Whitfield surveys a selection of editing tools that promise to take the black magic out of web page design.

Web pages are everywhere: in car advertisements, on magazine pages and even in offices. Everyone wants one, sometimes for show, sometimes for fun and at other times because they realise that it's the easiest and fastest way to distribute up-to-date information.

As industry leaders like Microsoft have woken up to the potential of the internet, so many more businesses are realising that with a basic web server they can ensure the most up-to-date information is available on every desk in the office.

For a small business, too, the web offers the potential to have a site that acts both as an advertisement and as a resource that can answer common questions, freeing up time for staff to do real work.

There's obviously a tremendous opportunity here but one big question remains in the minds of many: "How do we make our web pages?"

Traditionally, the answer was to learn HTML (the HyperText Markup Language) and roll your own pages but as browsers such as Netscape and Internet Explorer have added more and more features, fewer people want to learn all the tricks they need to make sure that their pages look good and that they work no matter what browser is used to view them. If the name of the game is producing pages with up-to-date information, then it is becoming increasingly important for people to be able to take the documents they already have (on spreadsheets, databases, and word processors) and turn them into good-looking, workable web documents with the minimum of hassle.

Tools for editing web pages are not particularly new and in the past some have looked more like tools for those who already knew HTML. They were of no use to non HTML-literate people, despite the shortcuts and automatic checking facilities they offered. But now there's a growing number of web design tools that allow people to use these aids with the minimum of effort.

Design is not only about turning your existing documents into web pages. It's also about how to make the best of them, doing for the web what DTP has done for corporate brochures and allowing you to add backgrounds, tables, images and sounds without having to worry about the complexities of the HTML code within.

The web has the power and the flexibility to be a democratic medium, open to anyone who can design a page and put it on a server. We've looked at seven different packages for creating your own pages to find out whether they're the tools you've been waiting for, or if web pages will remain as a black art for a little while longer yet.

Adobe PageMill 2.0

Personal Computer World Highly Commended

By the time this issue of *PCW* hits the streets, PageMill 2.0 should be shipping. We looked at a beta version for the Macintosh but the final release will also be available for Windows.

PageMill works as an offline browser and an editor. When you start up you see a browser-like window, complete with back and forward buttons. Clicking on a link in your page loads the appropriate file from your hard disk.

Editing a page is as close as you can get to using a word processor. You don't see any tags but there's a WYSIWYG display and you select styles from the toolbar at the top of the screen. There's support for text colours and sizes and the attribute inspector lets you alter some of the less common options. For things that PageMill can't handle, you can edit the HTML code in the main window.

Creating links is easy. When your page has been saved, an icon appears next to its title. Highlight text in another window, drop the page icon on it and the two are linked. If you don't highlight text beforehand, the title of the destination page will be pasted in as the link. Or, you can type in the destination of a link at the bottom of a screen for offsite links or more complicated URLs.

There is support for tables and frames. Just hold down the alt key, and drag one edge of the screen inwards to make a frame. You can place a document in a frame and edit it *in situ*, or open it into a new window. There's also support for Netscape plug-ins, so you can just drag and drop items like QuickTime movies or Acrobat files and position them on your page.

Support for Netscape plug-ins means you can embed movies in your pages just as easily as you would a picture

There's no doubt that PageMill is incredibly easy to use. But it does lack features such as HTML validation, so you can't be sure your page works with every browser until you try it. In beta, things did seem a little slow, and there was no obvious way to specify a frame target or change some table attributes. However, if that's all cleared up in the release version, this could be a winner.

PCW Summary

Price £TBA

Contact Adobe Systems 0181 606 4000

Good Points Very easy to use, especially for creating frames and including embedded objects. Linking your pages together is child's play.

Bad Points The beta version was a little slow at times, and there's no HTML validation.

Conclusion If the price is right, this will be a great tool for anyone who wants good pages with minimum effort.

★★★★

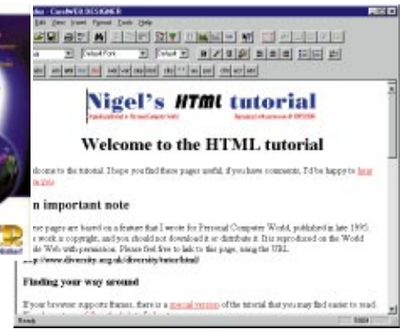
Corel Web.Designer

Corel's package includes more than just a web design tool, there's Web.Transit and Web.Gallery, too. The latter is a collection of images to use in your pages (provided they're not scandalous or immoral) as buttons, images and backgrounds, and there's an application to track down what you're looking for across a wide range of categories.

Web.Transit is a cut-down version of a bought-in product and lets you set up templates to handle the automatic conversion of word processor files into web pages. It worked well with our test documents and even created a hyperlinked table of contents at the top of the longest page, adding captions, headings and lists, although the web designer did complain of some invalid HTML. It also managed to correctly extract tables from the test files.

Although Web.Transit managed to find tables in the documents, Web.Designer didn't understand them, leaving each item of a table on a line of its own. Unless you were to view the raw source, or preview the page with a browser, you wouldn't know there was a table present. This, too, is a cut-down version of another app-lication but a lack of support for tables is one cut too far.

There are some good points. When you include an image in a document, it'll be automatically copied to the same directory as your HTML files and there's a selection of templates you can use to create your pages. There's no close command on the file menu, so if you want to work with more than one page at a time the New Window command launches a new copy of the program. You can't have multiple documents within one window and selecting text often seemed fiddly. The Undo feature always scrolled back to the top of the window, even when undoing a change at the foot of the page.



There's no support for tables in Corel's editor, but there's lots of clipart

PCW Summary

Price £99 (plus VAT)

Contact Channel Market Makers 01703 814142

Good Points Large selection of images and buttons. Powerful translation from word processor documents.

Bad Points Lack of support for tables in the editor. Irritating undo feature.

Conclusion The Web.Transit program is a useful tool, but if you want to create pages from scratch, you'd be better off looking elsewhere.

★★★

p127 ➢

Hot Dog 2.0

The Hot Dog editor can be confusing and you can accidentally delete tags

Hot Dog is rather the odd-man-out in this collection as it's a shareware product and lacks some of the features of the other programs, such as importing files from other formats. But it's not a poor relation, given the dubious quality of some other options. The main difference when you use HotDog is that you see all the HTML because it's displayed exactly as it will appear in the saved file, which could be off-putting to those who don't want to know about it, or awkward for the careless. HotDog works like a text editor, so if you want to delete the end of a tag you can and that sort of accident could easily mess up your whole page.

In this respect, HotDog is probably best-suited to those who know what they're doing with HTML and merely want something that's going to help them out by making it easy to insert tags. On that score it does very well. In one of our tests, converting a text newsletter to a web page, it was the easiest to use. There was no problem selecting lines of text and turning them into lists: clicking three times selected a line of text. This may seem trivial but, for example, it makes italicising captions much easier. It was the only editor which simplified the creation of definition lists from existing text. While most editors require too much cutting and pasting, and the repeated selection of elements, HotDog assumes that separators like colons divide terms from definitions, so highlighting text and clicking the right button does the job.

Don't worry about whether your pages will work with different browsers: a Color Tags option runs through your page changing the colours of each tag so you can tell at a glance whether they're standard, NetScape or Microsoft tags. There's a built-in ftp uploader, too, so you can transfer your pages to a server without having to load another program.

PCW Summary

Price £25 (shareware)

Contact FourthNet 01252 345441
Web; www.fourthnet.co.uk/softpage.html

Good Points Built-in FTP client. Easy to convert text to lists.

Bad Points It's too easy to break tags when you're editing the text of your document.

Conclusion Not an ideal tool for those who don't know HTML, but it's fairly simple to use and should help people who already know the language, to work faster.

★★★

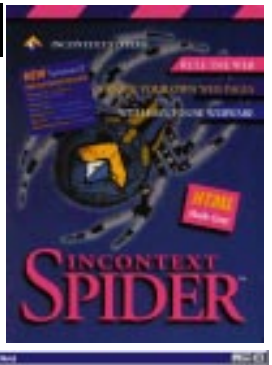
A Look At Future Developments

All the tools in this review are designed to make it easier to create web pages yet they still fall short of the simplicity of DTP. This is partly because they have to fit within the constraints of HTML which is not designed to specify the layout of a page down to the last millimetre. You can't have two columns of text on a web page unless you fake it by using a table, nor can you reliably fix a picture to the right-hand margin. While you can drag an image into a web page, you can't drop it where you want.

It's likely that editing tools will become more intelligent, employing some of the tricks that you have to use now, in order to achieve the desired effect. Future versions of applications, like MS Office, will let you save files as web pages with more intelligent conversion and more word processor features represented in the HTML. New products should make it easier to create your page by following a template: FrontPage and CompuServe's HomePage Wizard help but it should get even easier.

Tools like Java and Shockwave will be supported by more browsers and editors but they will need easier-to-use editors or more widely-available sample applications that can be customised with wizards. If not, they may remain the province of those with the time available to learn more web design. All these frills rely on HTML to support them and on organisations supporting that standard. Writing web pages will never be straightforward if the first thing you must decide is with which browser you want them to look best.

InContext Spider



InContext Spider doesn't look much like the finished web page.

Many web editing tools are designed to let you hide the HTML if you want. InContextSpider revels in it.

The main window is divided into two parts: a "logical editor" and a "content editor". The content section contains the text of your web page, while the logical editor shows the elements of the HTML so you can see that the title is surrounded by the HEAD and that is surrounded by the HTML statement. Clicking on one of the sections will scroll the contents window to that part of your document and highlight the text. It makes sense if you want to know about HTML but many people creating pages probably don't. If you don't know HTML you'll be stumped. There's no significant means of importing documents into InContext Spider. The slowness of the program showed up when changing a heading size: it took about a minute; far slower than any other package.

PCW Summary

Price £69 (plus VAT)

Contact Channel Market Makers (01703) 814142

Good Points Reasonably intelligent interpretation of text from clipboard.

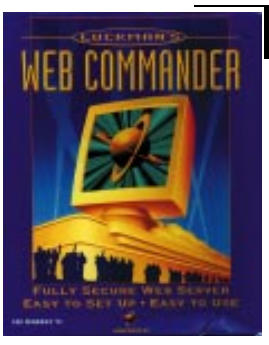
Bad Points Confusing interface. Slow. No importing of word processor files.

Conclusion A poor choice, with a clumsy interface lacking any real degree of WYSIWYG.

★★

p128 ➢

Luckman's Web Commander



This is a bumper package, intending to offer everything you'll need to establish your web presence: a web editor, web server, search engines, browsers, an image map editor, mail servers and a copy of Perl, the language used for scripting on many commercial web servers. There's security via SSL and Secure HTTP and an add-on for processing credit card transactions. There are versions for both Windows 95 and NT. The latter has support for virtual servers but costs a little more.

The manual goes into great detail, right down to configuring TCP/IP on your Windows 95 system. There are security options which prevent some users from seeing certain areas of the server and instructions on enabling features such as the processing of credit card transactions. But the manual offers no useful information about Perl, one of the most useful tools in the package.

Although the WebCharge application supports limited protocols, it's effectively useless as none are used by UK credit card processing houses. The DNS Wizard helps you fill out a request for your own domain name (this is often handled by your internet service provider). The collection of web browsers, while useful for testing your pages, is something that could easily be downloaded.

What of the web editing tool, Web Studio? It's a big disappointment: a rebadged version of InContext Spider replete with shortcomings and sluggish performance. It is a mystery as to why Luckman has chosen to bundle such a tool in a package that aims to be comprehensive.

PCW Summary

Price £89.99 (plus VAT)

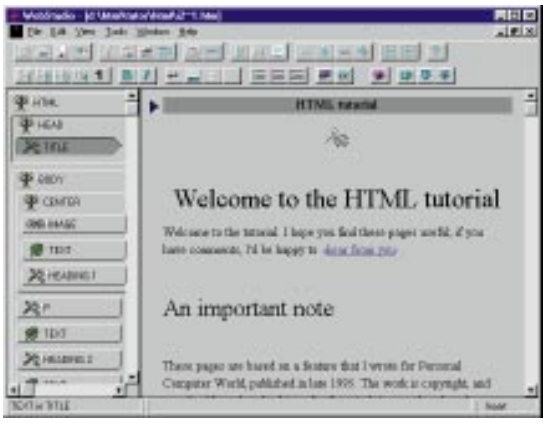
Contact Global Internet 0181 213 2400

Good Points A secure web server and a copy of Perl 5 are the high points of this bumper pack.

Bad Points InContext Spider and US-only credit card processing software.

Conclusion A low-cost way of buying a secure web server, with a few useful tools on the CD to save you downloading them, but there's little else to recommend this package.

★★★



Spot the difference! WebStudio is Spider with a different title bar

Microsoft FrontPage 1.1

FrontPage is Microsoft's foray into the web design market. It began as a product from Vermeer, bought when Microsoft realised that all around the internet was happening but it hadn't noticed.

There are three parts to FrontPage: the editor, the explorer and a personal web server. The idea is that you'll have everything you need to test your pages and even serve them up to a small audience. The explorer manages pages on your server, with all your pages organised into webs (a collection of pages beneath a top level directory).

Microsoft's breathtaking arrogance shines through this product: it virtually assumes that you'll be using a web server with "Front Page extensions". When you create a page with the editor, it's automatically saved into the "current web" in the explorer. Thankfully, though, you can choose to save as a file if you want to organise things more conventionally and although this may make it easier to upload your pages to a suitably-equipped web server, support for transfers via FTP would have been more standard and more sensible: the frames wizard only saves into the current web, and so launches the server and the explorer when you run it, thereby slowing down an 8Mb machine. There are plenty of other wizards, from home page wizards to systems that let you add discussion forums to your pages — but on a FrontPage server. Even the image maps are FrontPage specific, and it's a struggle to construct maps for other servers.

FrontPage has other limitations, too. You can add extended tags that it doesn't support, but although the image "width" and "height" tags are supported they are not changeable. On our test table, we couldn't scale an image to make it fit better and FrontPage insisted on changing manually-edited HTML back again.

Nevertheless, it is a simple and easy-to-use editor and it made a fairly good job of importing our test documents once they'd been saved in RTF format (Word isn't supported). You can create good-looking pages with minimal effort but if you don't watch the extensions they might not work on your provider's server.

PCW Summary

Price £99 (plus VAT)

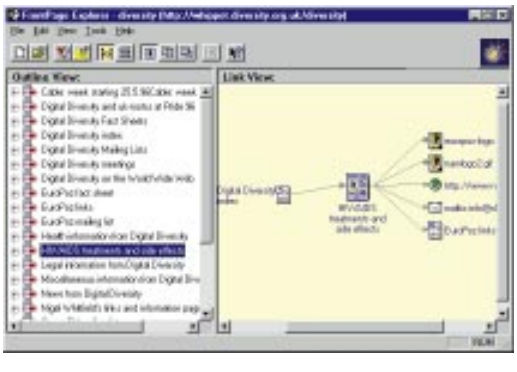
Contact Microsoft 0345 002000

Good Points Easy to use. Plenty of helpful wizards.

Bad Points Microsoft-centric. Rather fiddly management of your pages.

Conclusion A good starting point for many people, but best on a powerful machine. There should be clearer warnings about the use of the non-standard features.

★★★★



The FrontPage explorer lets you manage and update pages on a Microsoft server

p131 ➢

SoftQuad HoTMetal Pro 3.0

Personal Computer World Editors Choice

HotMetal is the only web page editor in this review to support just about every sort of content you can find on the web now. HotMetal Pro boasts the ability to read word processor documents and convert them into web pages. Nevertheless, we received mixed results from our tests. Lists were automatically found and converted in a text file, yet it wasn't as successful when finding lists in a long Word document, nor on headings (but there are options in the configuration file that control heading recognition). There were problems, too, importing tables found in a Word document: these were missed when they were in an RTF file. Also, inserting an image twice caused the program to crash.

Creating pages from scratch in the editor is straightforward. Some users may be put off by the tags being shown but they can be hidden if you don't want them. Creating frames was more straightforward than with the Wizard in MS FrontPage and the manual explains issues relevant to using non-standard web features. HotMetal Pro supports most features and while not always as accessible as, say, PageMill it is powerful, flexible and repays the time spent getting to know it.

When your page is ready for publishing, the "Publish" command effectively changes any references to your hard drive and you can then save the page in DOS, Mac or Unix format — something not offered on any of the other programs. That flexibility is also available for creating image maps which can be embedded in your page, or in either of the two common formats.

The way tags are displayed in HotMetal Pro can be a bit forbidding at first

PCW Summary

Price £99 (plus VAT)

Contact SoftQuad 0181 236 1001

Good Points Powerful and flexible. A useful printed manual.

Bad Points May take a little time to get used to. Tables are not found in RTF files.

Conclusion One of the most powerful tools on the market, but nevertheless simple enough for the novice user to produce basic pages.

★★★★★

Editor's Choice

Two products stand out as being flexible and up to the standards required for complicated web site design. The first is Adobe's PageMill 2.0. Although still in beta, it shows every sign of being a powerful tool that will let you create effects with tables and frame more easily than the frame wizard in FrontPage 1.1. The support of NetScape plug-ins will be a boon and shows how a little thought can result in a system that's about as drag-and-drop as you can get. The second is HoTMetaL Pro 3.0: very powerful, with more features than PageMill, and extendable. The ability to check which extensions you've used will be useful to those who want their sites to be widely read. If you already have documents that you want to convert for the web, the import features give it the edge over Adobe's product.

Front Page is easy to use but the perversity of assuming that you'll be using an MS web server is enough to complicate matters for those who might otherwise be ideal users. HotDog 32 is a noble effort, but intimidating if you don't know HTML. Corel's import features in Web.Transit are let down by the editor and neither Web Commander's Web Studio nor InContext Spider are desirable for modern web page design.

Our Editor's Choice is HoTMetaL Pro 3.0 for its power and flexibility. For most users, it will fit the bill perfectly and there's support for every facet of web page authoring. If the interface puts you off somewhat, PageMill 2.0 is a very worthy, close runner-up. Highly Commended.

Table of Features

Product	Adobe PageMill (beta)	Corel Web.Designer	InContext Spider	Luckman WebCommander	Microsoft FrontPage	Sausage HotDog 32	SoftQuad HoTMetaL Pro
Layout							
Tables	●	▲	●	●	●	●	●
Frames	●	❍	❍	❍	●	❍	●
Text colour	●	●	❍	❍	●	●	●
Text size	●	●	●	●	●	●	●
Advanced editing							
HTML validation	❍	❍	●	●	❍	●	●
HTML editing	●	●	❍	❍	❍	●	❍
Image map editing	❍	●	❍	●	●	❍	●
General							
WYSIWYG display	●	●	❍	❍	●	❍	●
Spell check	●	●	●	●	●	●	●
Word processor import	❍	▲	❍	❍	●	❍	●
Long filename support	●	●	❍	❍	●	●	●
Web server included	❍	❍	❍	●	●	❍	❍

Key: ● Yes ❍ No ▲ *These features are provided in Web.Transit, but not directly supported in the web editor.*

Tooling up for multimedia

Multimedia authoring packages are growing up — they've become more sophisticated and easier to handle. Panicos Georghiades and Gabriel Jacobs review four major products and brief you on three prominent new releases.

Multimedia as we know it is almost ten years old, yet only recently have we been able to begin to forget specialised equipment like i750 video boards and laserdisc players. It's now becoming possible to play MPEG full-screen video without any extra hardware.

Multimedia authoring software hasn't changed fundamentally in the last few years. Packages have become more sophisticated, they perform faster, don't crash as much as they used to, and are cheaper than they were. Essentially, they do just what they have always done which is assemble stuff together. We may be on the verge of a big change even in this area because of the internet. All multimedia authoring packages now provide net facilities but change is on the horizon because at the moment there is no prevailing net standard for multimedia.

Multimedia authoring software is still considered a specialised area. It's not surprising because the vast majority of users want ready-to-go, off-the-shelf software. They have neither the time nor the expertise to produce multimedia applications and authoring software is one element in the production process: you need all kinds of other software, graphic designers, sound recordists, video experts and so on. On the other hand, the number of people developing tailor-made applications is on the increase, as authoring software becomes progressively easier to handle.

Here, we concentrate on the two market leaders, Director and Multimedia ToolBook, and two other successful products, CBT Express and Illuminatus, all of which are under £1,000. We take a brief look at some new releases, too.

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Aimtech CBT Express 2.0

CBT Express is unlike the other products reviewed here which try to cover a wide development area. This is for developing computer-based training (CBT) modules, and is for use by non-programmers.

The product's market covers people in training and education, large companies requiring things like self-paced tutorials, performance support systems, evaluation and testing programs, and interactive guided tours. CBT Express enables those with no knowledge of programming to produce good applications. As there's no scripting language the program is probably the easiest to learn, of the four reveiwed here. You won't find commercial CD-ROM titles developed under CBT Express, although there's nothing stopping you from developing a commercial application. In fact, the producers say that the program has been used by a range of commercial and government organisations.

CBT Express works in a similar way to presentation programs. Individual screens are called frames. To build an application you select pre-built frames from libraries and fill in the blanks. You have hundreds of templates form which to choose. You can create your own but the pre-designed ones cover a range of authoring needs from menus to lessons, from glossaries to tests. Adding movies, graphics, text and buttons is straightforward and is done by using dialogue boxes.

Version 2.0, just released, includes Windows 95-style Wizards to automate common development tasks. A Flow Wizard helps you select one of four possible ways of navigating. There's a Wizard for creating exercises, one for building tests and another that prepares your applications for distribution. The new version bundles two media editors. The first, ImageLab, is a graphics editing utility designed for multimedia still images. Special features include deriving the best common colour palette from a selection of images and batch-processing of files. The second media editor, IconAnimate, is a cell-based animation program. Its text editor has been enhanced, now offering spell checking, search and replace, and various formatting features.

Following the trend of incorporating internet support with authoring programs, CBT Express supports http and ftp addresses. No longer does an application need to have all its data on the hard disk or network drive where it's situated, or on the CD-ROM on which it's distributed. Part of the data and media can exist on the internet.

You can play CBT Express applications from IconAuthor (and vice-versa) and both can share data. We suppose one advantage is the choice between the more powerful features offered by IconAuthor, and the ease-of-use afforded by the pre-built features of CBT Express.

The ability to store information on students and their progress is important in a training application. CBT Express holds various types of information, including student response, in a dBase file (a viewer is provided). In addition, free-form student responses can be captured using the program's new Essay and Survey templates.

Version 2.0 offers many minor enhancements, too. Some of them are innovative, while others should have been there from the start. They include linear tests, student pre-registration, various test options, feedback on exercises, flexible cursors, multiple frame importing from other courses, tooltips and more.

Even though you need to go through the supplied tutorial, you can begin putting applications together in under a day. This is faster than the many days needed by most novices using, say, ToolBook or Director.

PCW Summary

Aimtech CBT Express 2.0

Price £995 (plus VAT)

Contact Aimtech 0171 702 1575

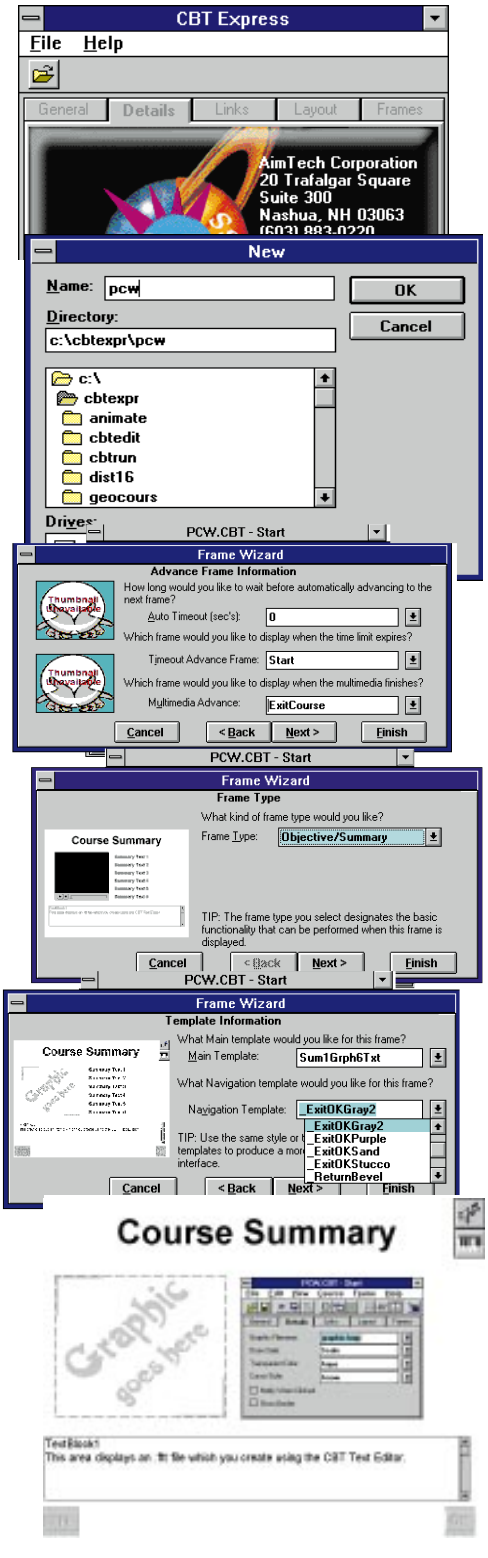
Good Points Easy-to-use, fast development.

Bad Points Specialised product, thus of less interest to those not in the area of training applications.

Conclusion The best product for end-user development of training applications.

★★★

CBT Express 2.0 walkthrough: Creating a new application...



From the top:

1. Start CBT Express 2. Create a new file/directory 3. Using the frame Wizard, select a frame type 4. Select the Main template and the Navigation options 5. Select the method of frame advance 6. Edit the frame by specifying graphics file, text file, MIDI and audio files etc

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Asymetrix Multimedia ToolBook 4.0

ToolBook is based on the metaphor of a book: your application consists of pages, each of which can contain objects. Each object has certain properties (size, position on the screen, colour) or a built-in reaction to a command.

You can place objects on the page by selecting them from a toolbox (at design time), or by placing them (at runtime) using ToolBook's programming language, OpenScript. This is a full-blown language with built-in file handling, a Paradox engine and about 1,000 commands.

The original idea behind OpenScript was to make it resemble English as far as possible. But an effort has now been made to bring it closer to Visual Basic. You can use Visual Basic VBX controls in your ToolBook applications. Although you can create very simple applications without learning OpenScript, if you've spent £800 on the package you'll want to learn the language properly so you can use the available facilities to their full extent.

Initially, you don't need to learn everything about OpenScript: one of the features we really like in ToolBook is AutoScript, a library of pre-written scripts ready for you to employ in carrying out various common tasks. This not only speeds development, but also helps you learn. Although a completed application is compiled to an EXE file, you still require runtime files. These are royalty-free with no obligations to Asymetrix, the producers.

ToolBook now runs even faster than Director 5, especially on start-up. You can now show multiple pages and windows simultaneously, and use 24-bit colour graphics with automatic dithering when applications run on lower colour-depth displays. You get some drawing tools including lines and patterns for vector-type graphics but the package doesn't include the paint facilities you'd find in Director. Animation facilities include a scriptless animation tool.

ToolBook has always been good on hypermedia, through the use of hotspots and hotwords. In the later versions, which support RTF (Rich Text Format) files, hotwords, in-line graphics and text-formatting can all be set while preparing the text in your word processor before importing it into ToolBook.

ToolBook has its own text-editing tools including a spelling checker and a full-text search with Boolean operators. All known media types are supported, including MCI types and most known image formats. The Media Packager is included, to organise the objects. This automatically checks all media links, assembles and compresses multimedia files, and generally gets the application ready for distribution. You have the capability to embed your own TrueType fonts to be distributed with your applications. The Setup utility then creates a simple end-user installation routine.

New features include Book Specialist which automates the creation of books, and a palette optimiser which automatically adjusts colours to create a unified colour scheme. Worth having is Script Remover to protect your code so that end-users can't pinch bits of it. And you can now access a specific page on the internet by clicking a button.

Some ToolBook users will be glad to know there's a new internet plug-in called Neuron. It works under Netscape 2, and it lets you download and play applications produced in ToolBook 4. Asymetrix is about to release a version II of ToolBook, specific to the internet. Another special edition, the CBT (Computer Based Training) edition of ToolBook, includes extra functions specific to the creation of learning material. The less specialised Multimedia ToolBook is now widely used in educational institutions for developing training packages. We've also seen it used to produce a number of product catalogues.

PCW Summary

Asymetrix Multimedia Toolbook 4.0

Price £795; CBT Edition £1,050 (both plus VAT)

Contact ICS 01256 469460

Good Points Versatile. Lots of features. Relatively powerful programming language.

Bad Points Longish learning curve.

Conclusion Good choice if you want to produce electronic books.

★★★★

Multimedia Toolbook Walkthrough: Setting up a button to move to the next page…

From the top:

1. Select the button tool at the toolbox and draw a button on the page
2. From the Object menu, select Button Properties
3. In the Button Properties dialogue box select Auto-Script
4. In the Auto-Script dialogue box select the Action Go to Next page
5. The script for handling the move to the next page is automatically inserted in the Button's Script property

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Digital Workshop Illuminatus 3.0

This UK product is the cheapest multimedia authoring program on the market, and it's very easy to use. However, you don't get much flexibility in the software. Still, it's quite a good program which can be used successfully for things like electronic newsletters or catalogues, or rolling screen-based demos. It supports the full range of multimedia (CD-audio as an extra) and this latest version will even handle MPEG video and PhotoCD images.

Its ease of use arises from the fact that no programming language is supplied and everything is done interactively. You start either by designing your own screen layouts, or using one or more of Illuminatus's templates. The program offers a wide collection of clip media.

You work with frames in which you place objects and then attach properties. Having imported a sound clip, video clip or still image, you define its properties by making selections presented to you as check boxes. As well as frames, you have ready-made buttons for various actions such as playing a sound or video clip, moving to a different page, or launching another Windows application.

Once you have made up a page from frames and buttons, you give it an identifier which is used to make up a final play list, and off goes your application. That is, after you've created an .EXE file out of it, which will work without any runtime Illuminatus module. Additionally, Illuminatus applications can be played from other programs. Any applications you create will not necessarily be wasted if you ever go for a more sophisticated multimedia authoring system. Indeed, some functions seem to have been supplied with the specific intention of being used with other programs such as a score-keeping module for games or educational purposes.

You can write your application to CD-ROM or floppies. In the latter case, Illuminatus will automatically compress the data into the right-size chunks depending on your disk capacity. At £129, this is a good buy for those who want to create fairly simple applications without messing about with scripting languages.

PCW Summary

Illuminatus 3.0

Price £129.95 (plus VAT)

Contact Digital Workshop 01295 258335

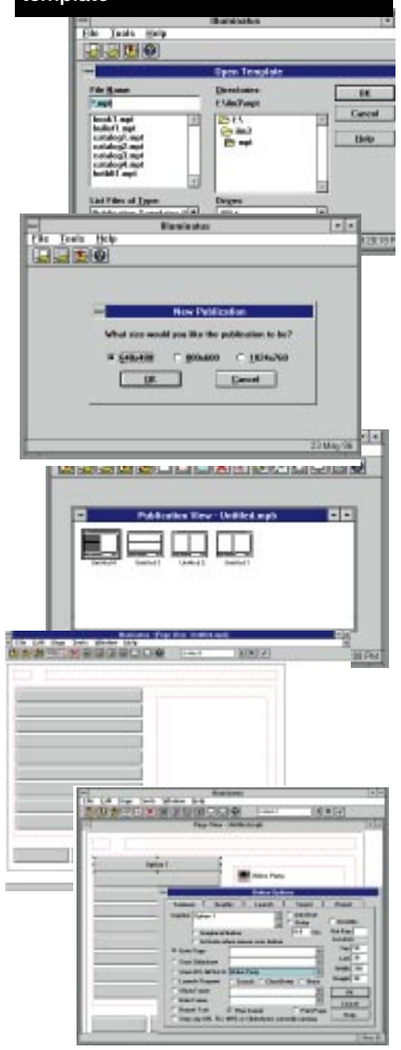
Good Points Cheap, easy to use.

Bad Points There are limits to what you can do without complexity and a programming language.

Conclusion Best value for money. For many applications you won't need anything more complex.

★★★★

Illuminatus 3.0 walkthrough: Creating a new application from a template



From the top:

1. **Select the type of template**
2. **Set the screen resolution for the application**
3. **The publication view shows thumbnail views of the pages**
4. **Clicking on a thumbnail takes you to that page**
5. **Clicking on a particular object on the page opens up a dialogue box where you set options**

Editor's Choice

We can only give firm views on ToolBook, Director, CBT Express and Illuminatus. Other products are either out of our scope or not commercially available. Although more or less everything is possible with all four products, each has a different target market. Choosing a multimedia authoring program from this group is dead easy, because they're so different.

Director 5 is strong on animations, impact, graphics and synchronising time-based events. Toolbook is strong on hypertext and applications with large amounts of data (databases, books, catalogues). CBT Express is for those who want to create training applications with no knowledge of programming. Its power lies in its ease and speed of use. Illuminatus tries to do a bit of everything. It's very easy to use, as well as being inexpensive.

So, if you don't have a large budget, go for Illuminatus. If you want to create training programs fast, go for CBT Express. More generally, have a close look at the application you're trying to create, decide whether you're really creating a movie or a book and then decide between Director and ToolBook. But overall, it's Macromedia Director 5.0 that gets the Editor's Choice.

Macromedia Director 5.0

Director is the industry-standard development tool for the Mac, and probably the most widely used authoring tool for commercial titles. Its success lies in its cross-platform compatibility, and its excellent animation facilities.

Director uses the movie (or storybook) metaphor. Each movie consists of actions called frames. Individual movie elements are called cast members and cover everything you may need in a movie. Even the scripts created using Director's programming language are cast members. Each movie can have up to 32,000 of them.

Director keeps track of where each cast member is in each frame, and controls the speed and timing of sounds, transitions and palette changes. The movies are played on a Stage. The main window, called the Score, looks like a spreadsheet, with each cell indicating what a particular cast member is doing in a given frame. The frames are represented by the columns, while the rows are there to show the six effects channels and 48 other channels. Because of the spreadsheet-type design it's easy to synchronise the various media, so Director is really good for applications where impact is of prime importance.

Its programming language, Lingo, resembles Basic, and isn't all that difficult to learn. It offers a wide range of commands and functions, and you don't have to learn much of it to do ordinary things because most functions are automated. Putting a cast member into a score means simply dragging it to the right place, with the mouse. Dragging is used for animation, too. You record the moves of a graphic by dragging it around and the in-between function generates intermediate animation frames without your intervention.

Director makes it easy to create effects such as transitions or colour gradients. Talking of special effects, with version five you can use Adobe Photoshop plug-in filters for images. You can also alter filter parameters over time to create animated effects, and Director bundles a special version of Kai's Power Tools. Two sound channels of digital audio are available if you have the hardware, alhtough Director can mix up to eight tracks of digital audio. Even this latest version can't directly incorporate CD-audio tracks or MIDI files and you're forced into sending MCI commands using Lingo.

With a new technology called Shockwave, Director movies can now be compressed and played over the internet. A utility called Afterburner post-processes source files to protect and compress the content by up to 60 percent. All this works with Netscape 2.0, but we're told that soon most other browsers will be supported. You can hook up to the net from a hotlink in a Director movie played from a CD-ROM or your hard disk. New Network Lingo commands support URLs and can take you to pages on the net.

RTF files can be imported, and there are controls for text-handling such as kerning, tracking, line spacing, indents and anti-aliasing. In addition, there's a cross-platform standard for third-party extensions, replacing the use of XObjects and DLLs. There's so-called onion-skinning, which is the ability to see other cast members in the Paint window, which makes for easy cell animation.

PCW Summary

Macromedia Director 5

Price £999 standalone; Director Studio £1,110 incl. Xres, Soundedit 16 for Mac or Sound-Forge 3.0 for Windows, Extreme 3D, and Deck 2 (prices excl. VAT)

Contact Computers Unlimited 0181 200 8282

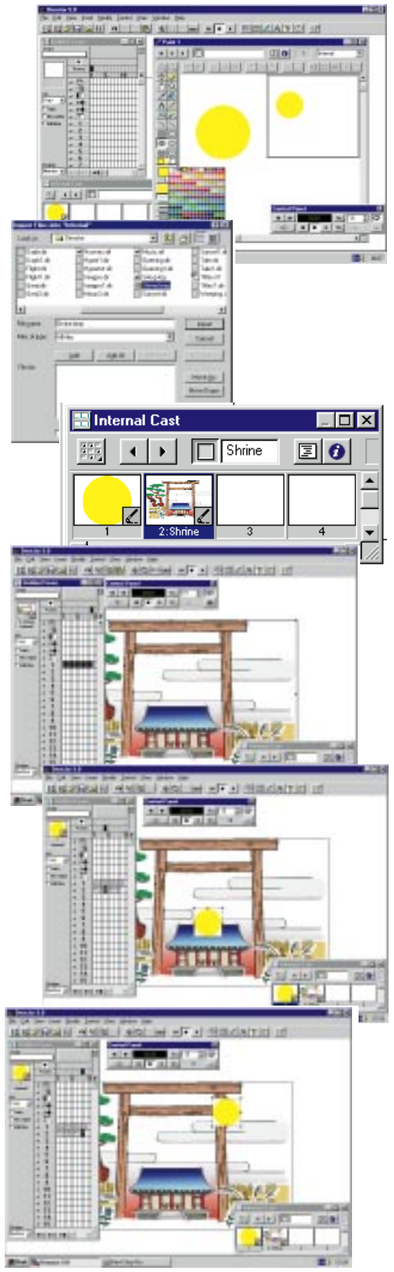
Good Points Good with graphics, animation and event synchronisation.

Bad Points Some things could be simpler.

Conclusion The choice for storybook-type applications.

★★★★

Director 5.0 walkthrough: Creating a very simple animation of the sun rising



From the top:

1. **Draw a yellow circle (the Sun) in Director's Paint facility. This is cast member 1**
2. **Import a background picture (of a Shrine) SHRINE.BMP. This is cast member 2**
3. **Both cast members can be seen in the Cast List**
4. **Place the Shrine on the Stage by dragging and dropping from the cast list to the stage**
5. **Place the Sun on the Stage at its initial position**
6. **Through a series of moves, move the sun up a little bit at a time and record its position in each subsequent frame. This picture shows the final position**

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A Brief Look At Some New Releases

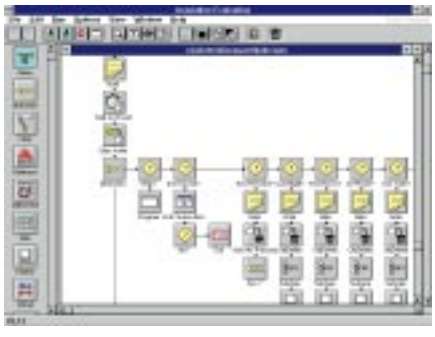
Icon Author 7.0

IconAuthor and Authorware Professional *(see below)* are the top-of-the-range multimedia authoring packages and they're expensive. You can do a lot without using their scripting languages: both use the concept of dragging icons of objects and tools onto a flow chart, and giving them various properties. IconAuthor has probably the widest range of platform portability and if that's important to you for distribution, then this should be your choice if you can justify the initial outlay.

Version 7 runs under Windows 95 and offers excellent support for the internet, allowing you to create pull-down menus easily and incorporate drag and drop into internet applications. There's also a facility for putting parts of an application which need regular updating on a local-area network or CD-ROM, and the rest on the internet. Other new features include image manipulation, spreadsheet and database data display, palette shifts and zoom graphics.

By the time we go to press, you'll be able to obtain a cut-down version of IconAuthor, called IconAuthor SE, for £995 (plus VAT).

- **Price** RRP £3,295 (plus VAT)
- **Contact** Aimtech 0171 702 1575



IconAuthor 7.0. With IconAuthor, creating applications is carried out using a flowchart method

GL PRO

This product, to be released by the time we go to press, is a programming language as opposed to an authoring program. But it's a programming language with a difference, since it's specifically for multimedia development. It's a re-incarnation of GRASP, a language responsible for many product advertising demos distributed on floppy disk. That's not surprising, because the runtime overhead is less than 190K, and the program enables you to write applications that will fit on a single floppy disk.

There has been a DOS version of GL PRO for a while now. But this Windows 3.1/95/NT version is brand new and supports WinG and DirectDraw technologies, matching playback speeds of C++ programs, and also providing good performance, even on low-end machines. There's support for Windows features, including palette control, sound, animation, digital video, MCI, API access, printing, dialogue boxes, text boxes and data entry. The language has 135 commands, 68 functions, and can also access system variables. Unlike most visual Windows languages, programming here is carried out in a sequential manner. But GL PRO is easier than the original Basic and is a good alternative if you're trained as a traditional programmer.

- **Price** £299
- **Contact** G-media 01734 344666

What's available in GLPro

Authorware 3.5

Authorware Professional was one of the first multimedia authoring products and one of the first to use the flowchart graphic method of assembling applications to replace programming. It's particularly good for creating interactive applications, which is no doubt why it still has a dedicated following.

With Authorware, creating applications is carried out using a flowchart method

The latest version is 3.5 (for Windows 3.x, 95, NT, Mac and Power Mac). It's about to be released as we write. It's native 32-bit, and comes with four other applications for preparing media. It interfaces closely with Director, and can use Director Xtras. Some of the new features are similar to those found in Director, such as Shockwave, which now enables Authorware applications to be played over the internet. There are many enhancements in the program's support for media and datafile formats, and over 1,000 clips (buttons, sliders and bullets). There are much-improved text-handling and text-formatting facilities. Hypertext links and hotspots are available and easy to use.

Authorware Professional competes very well with IconAuthor in most major facilities but until recent versions it lacked in important areas, such as on-line help. Other additions have brought it up-to-date with the competition, like the ability to read RTF files, a two-way Mac/PC compatibility and OLE 2. We'll be reviewing this product in detail when it becomes commercially available.

- **Price** £3750
- **Contact** Computers Unlimited 0181 200 8282

Nicholas Negroponte

If the MIT Media Lab in Cambridge, Massachusetts, is the R&D department of The Future Inc., then Nicholas Negroponte is its travelling salesman. A trained architect who became an early adopter of the digital age, Negroponte founded the Media Lab as a research facility to concentrate on his overlapping interests in computers, broadcasting and publishing, or as he refers to them, "the interactive world, the entertainment world, and the information world."

While still involved in shaping the overall direction of research and schmoozing with the hundred or more blue-chip corporations who bankroll the Media Lab's work, Negroponte no longer has a desk there. He keeps in constant touch by email while clocking up over 300,000 miles a year, promoting the digital future. He doesn't have a product to sell, but his vision has become such a valuable commodity that Negroponte is constantly in demand at conferences and seminars around the world.

Using metaphors and entertaining analogies, Negroponte describes a digital future filled with computing power which is dispersed among everyday objects. The microwave oven would talk to the toaster, which in turn would receive instructions from — here comes the futuristic bit — a "smart" doorknob that recognises when you arrive home and unlocks the door.

His crankier ideas of future technology, like the fridge which senses when you're out of milk and orders more, seem more like biblical parables than actual prophesies. Given his insight and unrivalled access to the masters of the digital universe, it would be a long-odds gambler who'd bet against Negroponte in a predictions game.

Before you can even think about a smart doorknob or milk-ordering fridge, you need to understand his explanation of the way our lives are fundamentally shifting from a world of atoms to one of computer bits. "Think about the difference between bits and atoms," he says.

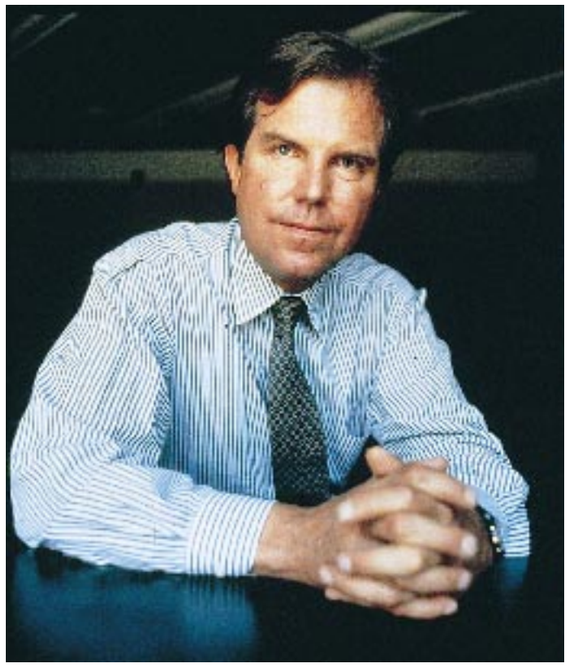
The MIT-man calls

Following his first-ever public appearance in the UK, **Nicholas Negroponte**, MIT's nearest living equivalent to hypertext, talked to Eddy Gibb about atoms, bits and his Big Idea.

In his book, Being Digital, a collection of essays on the implications of the computer age, published last year, Negroponte claims that about a quarter of his luggage space is taken up with the myriad phone jacks and power plugs needed to guarantee an online connection in any hotel room throughout the world. Presumably, he found at least one that would fit his laptop when he visited Edinburgh last month to give his first-ever public address in the UK.

Immaculately groomed in a sober but not unstylish suit, Negroponte's performance in front of hundreds of conference delegates is nothing short of stunning. His seductive delivery has the air of someone who could sell a born-again religion or snake-oil just as easily. Up close, he is less handsome than he appears on stage and considerably less charming, submitting to an interview with little grace. Despite his apparent impatience, he just can't help providing interesting answers to even the most banal questions.

Negroponte was booked to speak in Edinburgh about the impact of the internet on the business world but everything he talks about is linked to things he's said in the past and will probably say at similar events for the rest of the year. The trick is in his seamless presentation and Negroponte is probably the nearest living equivalent to hypertext. Everything he says about "being digital" is part of his Big Idea, with each point in the argument being linked to the others. Their sequence is less important than the points themselves.



"We're made of atoms, we wear and eat atoms. They have shape, size and mass, and when you put them together we know about them. Bits, meanwhile, have no mass and travel at the speed of light ,so we don't understand them in the same visceral sense."

"Consider a public library: why does it work? The answer is because of atoms. Assume I go and borrow a book from the shelf. I leave a bit of empty space. I take this book home, read it, and a week later I bring it back. If someone borrows it immediately, that's only 52 people reading it in one year. If you take the library of atoms and turn them into bits, when I borrow a book there's always a bit left, so in the new library 20 or 30 million people can borrow the same bits more or less simultaneously."

This is why the digital age will undercut nearly every current assumption about the way we trade information, receive entertainment media and communicate with one another. By removing the need to physically shift objects (the atoms) like books and bank notes, the power to zap digital information around a virtual world opens up a new way of life. For audiences like the one in Edinburgh, predominantly made up of middle-aged men in suits, it will change the way they do business provided they can get hip to the digital world in time. "The consequences are enormous," says Negroponte. "Internet transactions will probably represent hundreds of billions, if not trillions of dollars by the year 2000. People aren't going to hand over atoms for goods, they are going to hand over bits for goods. If anyone tells you they're not making money on the internet, they're smoking pot — millions of dollars are being made as we sit here."

Negroponte predicts the rapid disappearance of hard cash, cheques, or any kind of transaction involving paper and a signature. Instead, digital cash which is sucked out of one account in the form of bits and squirted into another, will take over as the dominant form of purchasing goods. The goods may also be in the form of bits (a book, a photograph, a piece of software) which can be bounced back down the line, but this causes a whole other set of problems relating to copyright.

In fact, digital cash is with us already. Mondex, a joint venture between NatWest and Midland Bank, is piloting smart cards which can be charged up with bits and then handed over as payment in much the same way as a phonecard provides you with call units. Concerns about security, which may have more to do with perception than reality, must be overcome, but even so, Negroponte is in no doubt that cyber-cash will be here soon.

If methods of digital payment are being taken seriously, Negroponte believes the issue surrounding ownership of bits, which can be copied endlessly and perfectly, has not been confronted. Copyright of software is mainly controlled through the distribution of atoms which contain the bits: the diskettes and CD-ROMs. Even in today's relatively limited wired world, such methods of transporting data are beginning to look a little prehistoric.

"What most people have forgotten is that copyright is supposed to protect the creative people so they can continue being creative," says Negroponte. "Copyright protects the distribution channel, not the author or artist, so as soon as you pull that distribution channel out of the loop, what you really want to do is protect the artist or author. But maybe artists want to give their work away free, just to get famous? Look at Netscape; the organisation became Netscape because it gave it away free. This is a good strategy to capture a market."

Biography — Nicholas Negroponte

Nicholas Negroponte, born in New York in 1943, went to school in Europe. He trained as an architect, specialising in the then new field of computer-aided design. Negroponte was more artist than scientist until he fell in love with the possibilities of the computer. In 1966, he joined the teaching staff at the Massachusetts Institute of Technology (MIT) and later founded MIT's architecture machine group which carried out pioneering work on the human interface with computers. As he never tires of saying, he knew Apple founder, Steve Jobs, when he was still in short trousers.

Negroponte spotted the application of computers at an early stage in the game. He realised how important the man-machine interface would be to their development. The subject still fascinates him, and Negroponte talks repeatedly about the industry's failure to make computers respond well to human speech and gesture. He sees mouse-and-keyboard as an impossibly primitive way of doing business.

Having published a series of influential texts on computer architecture and interfaces, Negroponte had an idea for an independent research facility which would push at the edges of information technology, with an emphasis on the overlap between computers, entertainment and publishing. In 1985, the MIT Media Lab was born, backed by American and multi-national corporations. He maintains that this plurality of backers remains the best way of guarding the Media Lab's independence.

For over ten years, Negroponte's pet project has become legendary for its weird science, like a computer in the heel of a Nike trainer which is powered by the footfall of its wearer. Visitors to the Media Lab are guaranteed some entertaining demonstrations. He is credited with coining the term "multimedia", and was one of the first to realise the importance of bundling processing power, video imaging and telephone links in a single box.

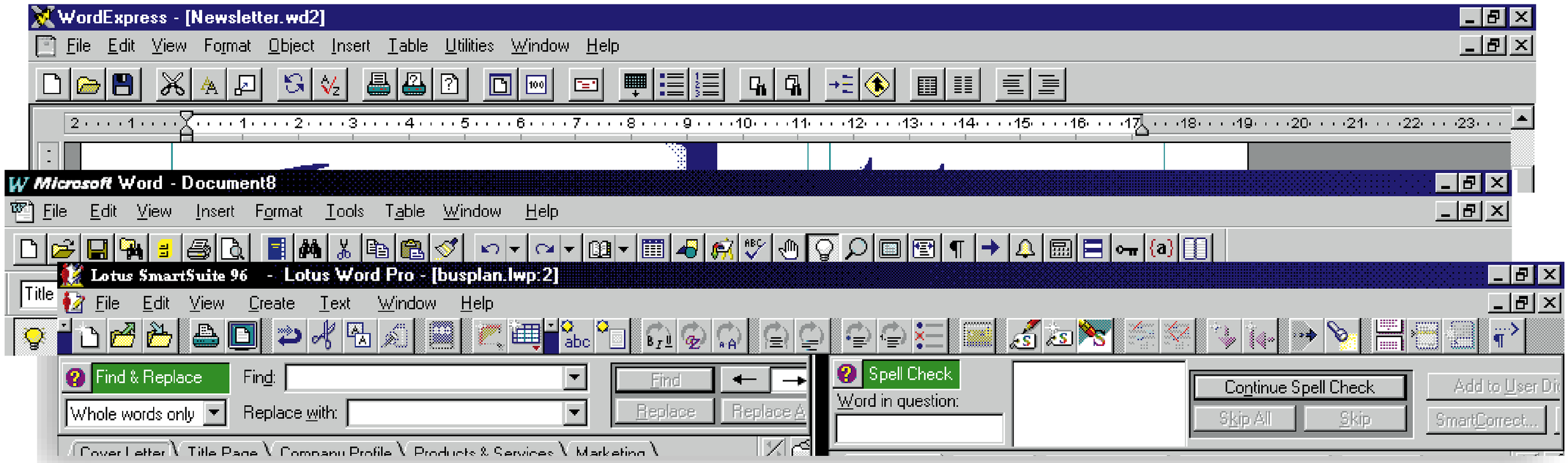
Although Negroponte has held visiting professorships and has been advisor to several national governments, he is known to the wider public as co-founder of *Wired*, the magazine he described as "Vanity Fair for propeller-heads". It embodies much of what Negroponte believes about computers in society. He still writes a provocative column for it, but his day job remains to invent the future.

This wild talk is what makes companies concerned with copyright rather nervous. How do you make money if you give it away free? Anyone who has trouble getting their head around these ideas is referred to by Negroponte as "the digital homeless" and, looking around the conference suite in Edinburgh, it seems such people make up a fair number of his audience. They are the people without email addresses who metaphorically squat in cardboard boxes on the sidewalk of the information superhighway.

"The digital homeless run companies and countries," says Negroponte, who refers to the Nintendo generation as the "digitally cool", adding: "Children are making up this huge tidal wave of digitally-literate people, and any parent knows how fast that tidal wave moves."

To be blunt, the digitally homeless are bricking it, or at least they should be. In Negroponte's view, where software, entertainment and information providers will converge into a single industry supplying bits down phonelines, there are many corporations with a lot to lose. They've got a lot to gain, but it's just they haven't yet worked out how. As the man says: "The argument about whether it's the TV or the PC which will become the home information appliance is over. It's the PC." ■

Group Test: Word Processors



As good as your word

Can't find the right words? These days you can just sit back and let your word processor take the strain. Tim Nott rounds up a selection of Windows packages, and a few DOS ones, to see who gets the last word.

Personal computers — what do you use yours for? Plotting the course of inter-continental ballistic missiles? Forecasting coffee futures? Designing power stations? All these things are possible, but word processing has remained the core activity of personal computing since the early 1980s.

The key, killer feature then was that everything could be revised over and over again before committing it to paper. Errors could be corrected, blocks of text added, removed or moved, with gaps automatically closing up and pages being renumbered to suit. This dealt a terrible blow to sales of correcting fluid, but there was more.

Liberated from the chore of retyping, we could also use bold, underlined and italic, check our spelling, and if we were really lucky, have a preview of what it was all going to look like before committing it to paper. By the end of the decade, with the advent of graphic user interfaces, such as GEM and Windows, what-you-see-is-what-you-get (WYSIWIG) editing was emerging. The launch of Windows 3.0 in May 1990 set the seal on WYSIWYG as a basic human right, and within a year, at least four high-end Windows word processors were competing, all priced over £400.

In the ensuing five years, it has become cheaper and better. We have a vast choice of high-quality typefaces, versatile column and frame layouts, graphics and embedded "objects" from totally different applications such as a spreadsheet, table or chart. At grass roots level, even the tricky business of getting the words into the machine correctly spelt and in the right order has been made easier, with drag-and-drop editing, grammar checking and "smart" on-the-fly corrections of commonplace mistakes.

In our last word processing round-up, we were still in the 16-bit world of Windows 3.1. Since then, Windows 95 has arrived, bringing with it smoother multi-tasking, a farewell to the "system resources" limit, far more versatile file management and the introduction of long file names. But it's been more of a shuffle than a stampede for the 32-bit bandwagon. Of the eight Windows products reviewed here, only four have joined the Windows 95 club.

Over the next 12 pages, we review and rate the current products to find the one worthy of a *PCW* Editor's Choice. We also look at the state of play in the DOS market, find out about Wizards, and predict what the future holds for word processors.

Word Processors Contents

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MICROSOFT WORD 7.0

Personal Computer World Editors Choice

(Left) Multiple toolbars for different jobs in Word 7

(Below) OLE in action: "in-place" editing a WordArt object

Still the leader on both 16- and 32-bit platforms, largely thanks to its ensuite sales, Microsoft Word has managed to maintain its "all things to all users" position while keeping an intuitive and easy-going approach. There is plenty of help, including a tutorial and "Wizards" to guide the user through setting up a document or complex procedures.

Microsoft started the "smart" race in Word 6 with various innovations under the banner of "Intellisense", including automatic left- and right-handed quote marks and correcting errant spaces after drag-and-dropping text. There was automatic capitalisation of the start of sentences and weekdays, and automatic correction of two initial capitals. Best of all was the facility to auto-correct custom mistakes. If you habitually misspell or mis-type a word, you can add it to the list, so "nad" will always get changed to "and".

Release 7 brings more. "As you go" spell-checking underlines suspect words in red. If you right-click, a list of suggested replacements is offered, together with the options to ignore the word or add it to the user dictionary. As before you can undo an autocorrection, but Word can now keep an "exceptions" list, so expressions such as "PCs" or "MPs" don't fall foul of the "two initial capitals" rule. There are automatic borders and bulleted or numbered lists, and a find/replace word forms option. Replace "build" with "construct" and "builds" will be replaced by "constructs", "built" with "constructed", and so on. It's clever, but not clever enough to distinguish between "building" as an activity and "building" as an object, so needs using with care.

There's a wealth of versatile page layout features, with multiple columns, framed graphics with text wrap, tables that can use, albeit rather awkwardly, mathematical functions, and a set of drawing tools including text boxes and arrowed "call-outs". Unlike most word processors, the latter are "free-range". You can use them anywhere on the page without having to create a frame, and place drawn objects either on top of or behind the text. Further page enhancements include OLE applets to create charts, mathematical equations and logo effects.

Document management is equally impressive, with indexing, cross-referencing, footnotes and tables of contents. An outliner lets you structure a document by headings, revealing or hiding nested levels as you work, and a "Master" document can be split into sections so that different members of a group, for instance, can work simultaneously on different sections while retaining overall page numbering and indexing.

The opportunities for customising are vast. You can have any number of purpose-made button bars on-screen, or edit the keystrokes and menus, including the right-button pop-up.

There's a powerful macro facility which you can record or edit in the WordBasic language.

New features include integration with Windows 95 Exchange for finding addresses and composing email messages. Improved file management features include "Find Fast" indexing and the Windows 95 benefits of long file names and shortcuts to directories. An Answer Wizard lets you search the help file with queries in plain English, but I found this tended to produce too many spurious matches. Although the new Windows 95-style help system may be easier for beginners, existing users might find it slow and fragmented compared with previous versions.

Two security warnings. When using Word 7 and the August 95 release of Windows, fragments of deleted files can turn up in Word documents. Though they are not visible within Word itself, they can be seen with a text editor. The cure is to get the Win95 Service Pack or, for 3.1 users, the 6.0c release of Word. Secondly, some macros can be set to run automatically, laying the way for viruses to be transmitted via documents, as per last year's "prank macro" scare. Again, there is a freely available fix.

PCW Summary

Good Points Good balance between power and ease-of-use.
Bad Points Tables not up to Lotus or WordPerfect standards, and new-look help files are awkward.
Conclusion Still the best all-rounder of the bunch.
Contact Microsoft 0345 002000
Price Around £200 (plus VAT)

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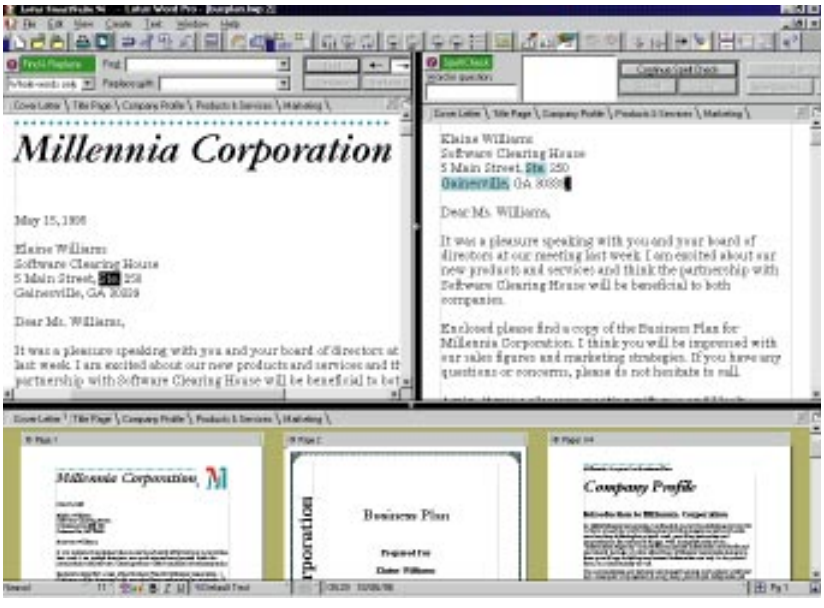
LOTUS WORD PRO 96

Formerly known as Ami Pro, Word Pro comes in both 16- and 32-bit flavours. The version reviewed here was part of Lotus SmartSuite, with English, French, German, Spanish and Italian versions on the same CD, and ten more languages for the spelling checker.

There's a strong emphasis on document management in this version. Tabbed section dividers appear across the top of a document, for navigating and ordering. OLE objects can be given their own labelled tabs, and a section doesn't necessarily have to coincide with a page break. Viewing a document brings more innovation with tiny, but editable, "page sorter" views where pages can be rearranged by dragging. Views can be mixed: you can, for instance, have page layout and outline side-by-side with a row of thumbnails below. Teamwork is another strong suit, with support for internet connectivity. Lotus Notes and annotations via "Rich Comments" mean that multiple versions of a document can exist in the same file.



(Above) Multiple views in Lotus Word Pro (Left) Word Pro's Infobox provides a constant shortcut to every aspect of formatting (Below) Smart correction and "Click here..." blocks make life easier

The Lotus interface has always been innovative, with Ami Pro's clever status bar pop-ups for fonts and formatting, and Word Pro goes further with a "task-sensitive" interface. As you work, the menus and buttons change automatically to suit the task in hand, be it drawing shapes or editing text. New too is the Infobox, a modeless (i.e. it can be left permanently open) dialogue box that contains all the controls relevant to the current selection. While the pointer is within text, or with text selected, you have tabbed pages of controls covering everything from font and style to spelling, language and bullets. With a graphic or frame selected, you have instant access to borders, text wrap options, position, size and so on. All changes happen in real time, and there is no "OK" or "Apply" button to click.

In terms of page design and content, everything you could reasonably expect is here. Tabling is excellent, with a small selection of spreadsheet-style functions for summing, averaging, finding maxima and minima of sets of figures, as well as normal arithmetic operators. There is excellent charting and equation-editing, and a range of drawing tools which must be used in a frame. Fancy logo effects don't quite measure up to Word or WordPerfect's, but you can rotate or curve text. A bonus is that you have a small but effective range of image-processing tools for altering the brightness, contrast and sharpness of imported bitmaps.

Customisation is limited to button bars and function keys that cycle between font attributes and styles, but there is a fully-equipped macro language with its own editor and debugger. There are several "Smart" features, including real-time spelling checks, smart quotes, auto correction, capitalisation of weekdays (but not the start of sentences) and correction of two initial capitals. Unlike Word or WordPerfect there's no search-and-replace of word forms, and as you have to switch to the spelling controls rather than right-click to get a list of suggestions, the "as-you-go" spelling correction is rather awkward. Performing a conventional spelling check is also far slower than Word or WordPerfect, as it rechecks the entire document each time rather than skipping unchanged sections. Display updates, especially with multiple views and graphics enabled, also seem sluggish compared with the competition.

There's plenty of help, with a series of animated tutorials and demos, an "Ask the Expert" feature and a series of "SmartMasters". These are interactive templates which let the user replace the sample, pre-formatted text with their own.

PCW Summary

Good Points Stylish and original, with good workgroup support.
Bad Points Slow, and not quite as "smart" as the competition.
Conclusion Excellent value.
Contact Lotus Development 01784 455445
Price £99.95 (plus VAT)

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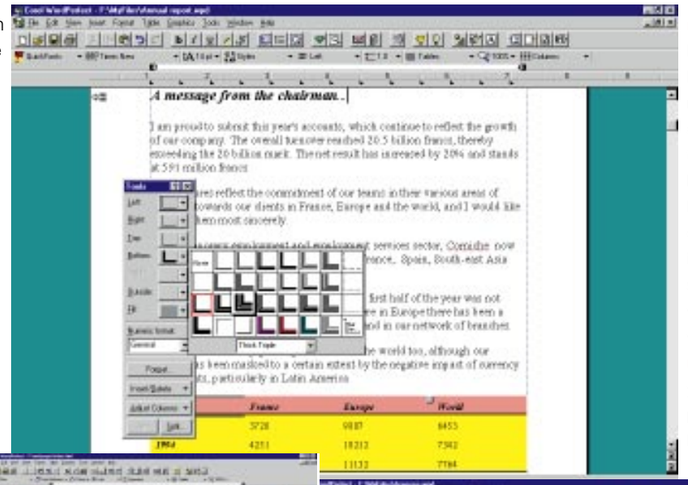
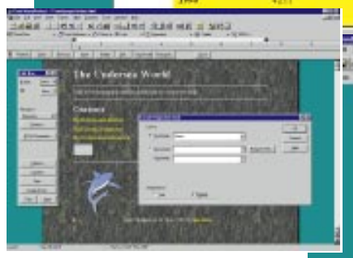
WORDPERFECT 7





(Left) Word Perfect's new Edit Box, a more elegant alternative to the Feature bars (Below) Layout capabilities include shaped text wraps and watermarks (Inset) Create your first web page with the Expert

The last of the big three to join the 32-bit club, the one-time leader in DOS word processing has seen two changes of ownership recently and is now part of the Corel Corporation. Depending on the options you choose, you'll need 36-70Mb of disk space.

In terms of "Smart" features WordPerfect 6.0 didn't match Microsoft Word 6.0, but version 6.1 leapfrogged ahead with word-form replacement in the "Find/Replace" and thesaurus. Word 7 caught up, although not in the thesaurus, and forged ahead with smart formatting such as bullets and borders and on-the-fly spelling checks. WordPerfect 7 evens the honours by incorporating these features, and the spelling checker makes a far better job of spotting missing spaces. Whie Word 7 has no suggestions for "wedanced the nightaway", WordPerfect gets it right first time.

The interface has the sharp Windows 95 look but apart from that has changed little. You still have the rather eclectic array of buttons and bars, and the Tool bar defaults to a normal mix of file, clipboard, emphasis, proofing and other tools, but different sets are available for different tasks. Unlike Word, you can't have more than one set open. Below this is the "Power bar". This can have text and/or pictures, and, although there is only one Power bar, you can add as many buttons as you have room for. When performing specialist tasks such as mail-merging, outlining or indexing, a "Feature bar" pops up with non-editable text-faced buttons for the job in hand.

"Quick spots" are small non-printing buttons that appear beside every paragraph or picture as you move the pointer around the page. Click on these and up pops the Edit Box, offering various formatting options such as paragraph alignment or borders. It isn't as comprehensive as Word Pro's Infobox, and doesn't really seem to offer any additional functionality to that provided by the toolbars and right mouse-button. With graphics and tables, it replaces the rather grim Feature bar. New, too, is the "shadow cursor", a lighter version of the insertion point bar that follows the mouse pointer around, tracking the position in the text so you know exactly where a click will "land". You may find this useful, although I found it too easily confused with the "real" insertion point, and, unlike Quick spots, it can't be turned off.

WordPerfect's graphic capabilities are as impressive as ever but still slow. You get a more comprehensive set of drawing tools than Word, but they take far longer to load and you can only use them in a drawing frame. You have a more versatile system of captioning pictures, but the old WordPerfect awkwardness shows here. Instead of a dialogue to edit the caption text, the whole screen is commandeered for the purpose, with a single button feature bar to close and return to the page. In terms of layout features WordPerfect excels as always, with contoured text wraps, "watermarks" and decorative features such as dropped caps or paragraph separators. Another new layout feature is the facility to move text margins and columns by dragging guidelines.

An address book which interacts with the letter template, "Experts" is a new feature, and there's a double dose of electronic publishing. You can save a document in Envoy format which, like Adobe Acrobat, is a hypertext format that can be viewed without having the originating application. A range of internet features includes a button to launch your web browser, conversion between WordPerfect and HTML documents, and direct creation of web pages.

PCW Summary

Good Points Brilliant in parts, especially tables, graphics and proofing.
Bad Points Slow, and still sporting a quirky interface.
Conclusion The best Windows WordPerfect yet, but it won't knock Word off its perch.
Contact Corel 0800 973189
Price £199 (plus VAT)

WORDSTAR 2.0

The original WordStar for Windows was, as we said in 1993, "by no means a front runner". Version 2.0 was such a vast improvement that following its acquisition and sub-£50 marketing by Softkey, in 1995 it won our Editor's Choice. This accolade failed to spur its owners on to greater things, and the version reviewed here is the very same one, albeit on a CD-ROM.

WordStar's selling point is that despite having most of the high-end word processing features, such as a macro language, grammar checking and indexing, it also has many of the features you'd normally associate with a desktop publishing application. Everything, including text, pictures or OLE objects, must be placed in a "frame". If you start a blank document or use one of the supplied letter templates, you are already supplied with a single, full-page text frame, so the whole business is transparent.

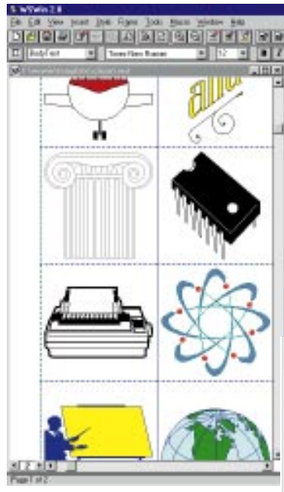
Should you get more ambitious you can switch to layout view, where you can add and manipulate frames rather than their contents. Frames can be given a variety of borders, and when you create a graphic frame, a box of drawing tools automatically appears. Text frames can be "linked". As with a newspaper or magazine, you can start a story on one page and continue it several pages later. The link ensures that editing the story doesn't affect the layout or contents of the intervening pages. Frames can also be placed within other frames, so you can "box out" text with an enclosed graphic, or put a text panel or caption inside a diagram. There's an excellent word-counter that works on a selection, frame, story or document, and a reasonable selection of templates and clip-art. Although you don't get the type-tweaking equivalent of Microsoft's WordArt or Corel's TextArt, you can rotate text to any angle.

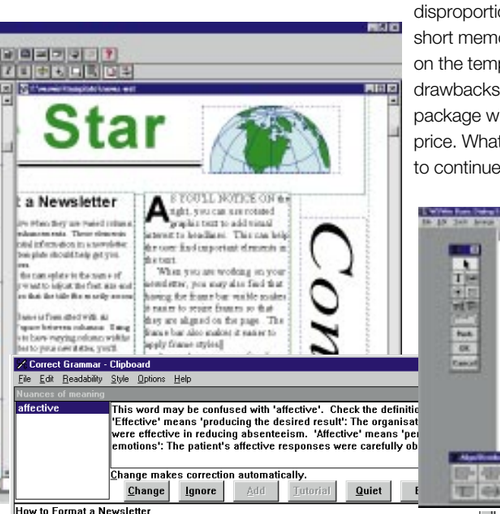
Moving from newspaper-type documents to longer works, you get a full set of tools for building indexes and tables of contents, illustrations and references. Pictures can be anchored to the text rather than the page, so if you're editing a book the illustrations stay in the relevant context. Business users have an impressive mailmerge facility which will import data from dBase or ASCII files, as well as the bundled MailList program.

In terms of creature comforts and "Smart" features, WordStar shows its age. Although there's a macro for producing automatic left- and right-handed quotes, there are none of the autocorrection features seen in the high-end products. Although there's reasonable online help and a 230-page manual, you don't get the wizards, coaches and other hand-holders seen elsewhere. One useful feature is "Quickpath" in the Save and Open dialogues. Instead of burrowing down several levels to deeply-nested directories, you can give them meaningful names and access them with one click.

There's plenty of scope for customisation, with a configurable button bar and a basic-style macro language complete with a visual dialogue box designer. Fifty six well-documented and commented macros are included, plus you can create custom keyboard shortcuts. Three predefined sets include the "Classic" DOS WordStar and WordStar 2000 Control + K combinations.

Performance isn't brilliant, the spelling check being particularly lethargic. Another drawback is that short documents have a disproportionately large file size, with even a short memo taking up 30-40Kb depending on the template being used. In spite of these drawbacks, it's a competent and attractive package with plenty of power features for the price. What a shame SoftKey seems reluctant to continue developing it.





(Above) Dragging clip-art from templates in WordStar
(Right) WordStar's Correct Grammar spreads fear, uncertainty and doubt
(Far right) Roll your own dialogue boxes for WordStar macros

PCW Summary

Good Points Cheap and feature-rich, especially in page-layout capabilities.
Bad Points Getting old, with poor prospects for updates.
Conclusion A bargain buy, but probably a dead end.
Contact Softkey 0181 246 4000
Price £42.51 (plus VAT)

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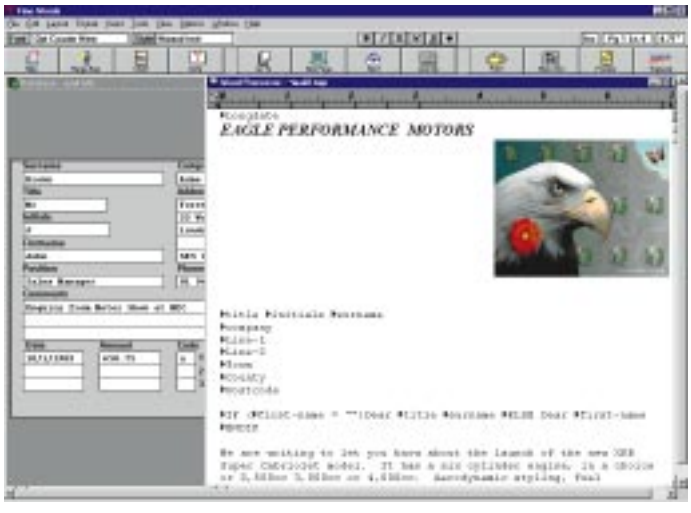
TOPLEVEL FINE WORDS 1.7

Strange though it may seem, not everybody wants DTP-like layout features, drawing tools, grammar-checking and all the other paraphernalia inherent in modern word processors. Some people, particularly those running small businesses, would like something that produces smart business letters, manages customers' and suppliers' addresses and can be learnt in a morning. Toplevel Fine Words probably has all that these users need. It comes on just two floppy disks and runs on any PC with Windows 3.0 or later. The interface is very simple: one row of buttons correspond to the function keys, and an optional help line at the bottom of the screen doubles as a menu of accented characters. Although there are no DTP frills, there's a simple charting module, and you can import pictures although graphics and text can't co-exist side-by-side. There's a thesaurus and word-counter, formatting "styles" (named combinations of character or paragraph attributes) are supported, and that's about it.



Plain and simple, with a deluxe mail-merge — Fine Words

The star of the show is the database module. This claims to support up to four billion records of 200 fields, although we didn't put this to the test. The obvious use for this is in mail-merging, and despite rather inadequate documentation there are some extremely powerful features here. One brilliant feature is the use of "conditional" text, depending on the contents of a field. This could have a variety of uses in a mail-merge, for example the time, date and venue of a "road show" depending on the addressee's location, or the degree of severity of an overdue account reminder dependent on the time lapsed. On the down side, it refused the search and replace on our 240Kb test file, although this worked fine on smaller files.

PCW Summary

Good Points Cheap and very simple to use, with an excellent mail-merge feature.
Bad Points Sparsely featured, and unhappy with very long documents.
Conclusion Excellent for no-frills, no-learning-curve, small-business correspondence.
Contact TopLevel 01453 753955
Price £29.99 (plus VAT)

WORD EXPRESS 2.0

Word Express is shareware and comes in both 16- and 32-bit versions. While not in the same league as Word Pro, extra spelling dictionaries in French, German, Spanish, Danish and Dutch are available. When you first start the program, you're prompted for your name, address and other details. This information is used in the templates to produce customised letterheads with your details already completed. Since this is in US format, with city, state and zip codes, European users will need to return to the "User Info" dialogue to experiment in getting the letterheads to look right. Word Express follows the DTP convention of having text and object modes, switchable from the button bar or right-button menu.

Word Express. Low price, but lots of features

Switch to the latter and the formatting bar is replaced by a set of frame and drawing tools. You can place tables, pictures, OLE and other objects into frames on the page. Multiple columns can be specified on a per-section basis, and like Word you can draw simple shapes anywhere on the page without having to contain them in a frame.

Although the English-only version takes up just 9Mb of disk space, it's remarkably well equipped. There's now an outliner, and in the Windows 95 version, full OLE/2 support. There are automatic bulleted and numbered lists, envelope printing and even a fancy text logo effect similar to, but much faster than, those in Word and WordPerfect. There is a word counter and thesaurus, and support for chapter and page numbering. The only serious lack is a macro language.

PCW Summary

Good Points Shareware, compact and available in both Windows 95 and 3.1 versions.
Bad points No macro language
Conclusion Excellent value, in terms of both price and disk space.
Contact The Thompson Partnership 01889 564601
Price £29.00 for single language version, extra languages £15.00. Three language version £55.00 (all plus VAT)

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THE UNIVERSAL WORD 6.2

Although it's possible to get different language versions and additional spelling dictionaries for some word processors, our two final Windows offerings are purpose-built international offerings. The Universal Word is the dearest application reviewed here, and comes with 87 fonts in not just the Western character sets, but Arabic, Cyrillic, Urdu and many more. There's a rather formidable display of three button bars on startup, but most of these are concerned with the usual business of font attributes, alignment, file and proofing operations.

The exotic characters of The Universal Word

The key to Universal Word's difference is the language drop-list. Pick a language from Arabic to Wendish from the list, and three things happen. Firstly, the keyboard layout changes to suit the current language. French will change the top row from "QWERTY" to "AZERTY". You can override the defaults if you are mixing languages but want to stick to one layout. Secondly, the contents of the font drop-list changes. Although there is no difference switching from French to English because they both use the western European character set, if you change to Arabic, your Arial and Times will be replaced by Al Waleed and Tuluth plus many other fonts. Anything you type in these fonts will be laid on the page from right to left, apart from numerals which are (correctly) displayed in the same order in both Arabic and Western formats. Thirdly, the section will be marked for proofing in the target language, though you will need to purchase the relevant dictionaries as they aren't included in the core product. There isn't a lot in the way of page-layout features, but you do, rather curiously, get an extensive range of image-processing tools. Performance was poor. It took nearly ten minutes to load the sample text file.

PCW Summary

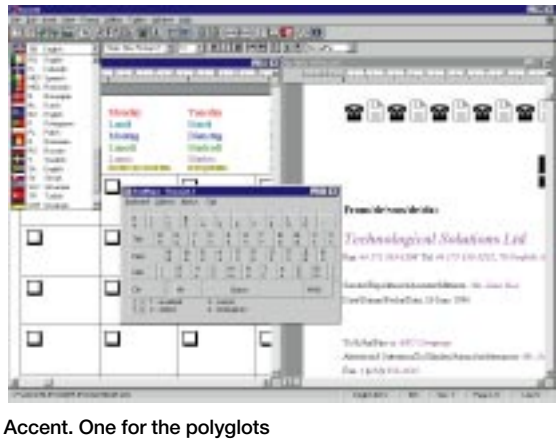
Good Points Huge range of available languages and typefaces.
Bad Points Expensive, poor on page layout, only English proofing included in basic product.
Conclusion Poor value compared with its niche rival.
Contact Prestige Network 01344 303800
Price £399 (plus VAT). Extra dictionaries/thesauri £29 each

ACCENT PROFESSIONAL 2.0

Our other multilingual contender comes in a variety of editions. We reviewed the top-of-the-range Accent Professional 2.0, but other versions, offering fewer languages, are available. First, the statistics. The professional version comes with 160 fonts, encompassing seven character sets including cyrillic, Arabic, Greek, Hebrew, Turkish, east European and western. You get a choice of seven installation languages and, once up and running, you can switch between any of nineteen menu languages and eleven help files. There's a choice of thirty typing languages, seventeen spelling languages and eleven thesauri. Added bonuses include the Berlitz five-language mini-dictionary, Lotus Organiser and WinFax Lite.

Like the Universal Word, the key to Accent's polyglottery is in the language drop-list. The proofing and keyboard layout languages are set in the same way as Universal Word, but the fonts work in a slightly different way. You see a list of all available typefaces grouped by character set, and the selection automatically jumps to the relevant set. You can also mix-and-match languages anyway you want them. You can type in German but with Arabic menus, thus making things far easier for non-English speakers. Should you find that playing with the menu languages leaves you lost in a foreign tongue, then the globe-shaped "panic button" gives a list of languages in their native typefaces and formats.

Although the page layout facilities go further than The Universal Word's, with multiple columns and tables, there are no drawing tools. There is a word counter, but unlike The Universal Word, no tables-of-contents or footnotes. Once again, there is no OLE support, not even in Spanish. A spelling check in English was made rather tedious by Accent's inability to recognise punctuation, but it did make sensible suggestions for run-together words. Finally, we had problems printing our 240Kb test document — it just didn't want to know.



Accent. One for the polyglots

PCW Summary

Good Points Huge range of languages supported.
Bad Points Few high-end features, no OLE, and problems printing.
Conclusion Good value for a specialist product.
Contact Accent Software 01923 208435
Price £279 (incl. VAT). Other versions from £69

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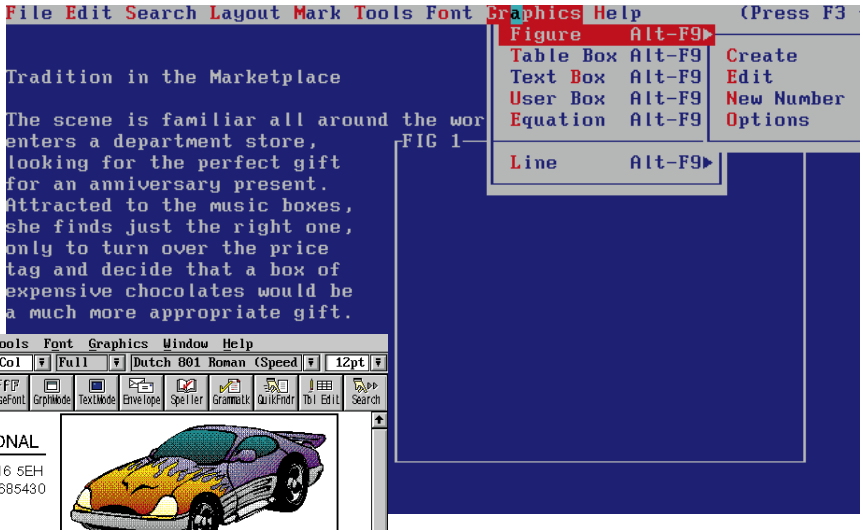
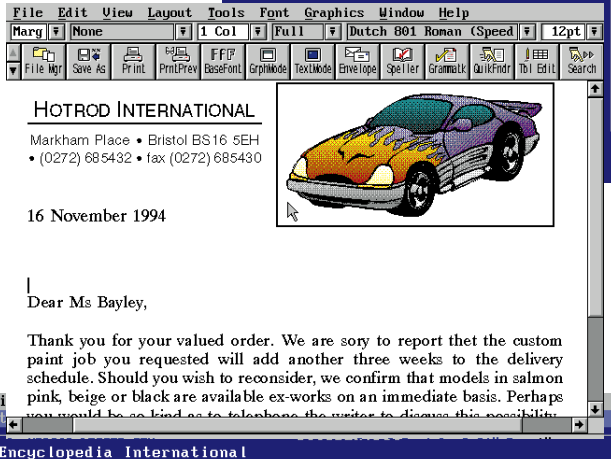
TAKE THE DOS OPTION

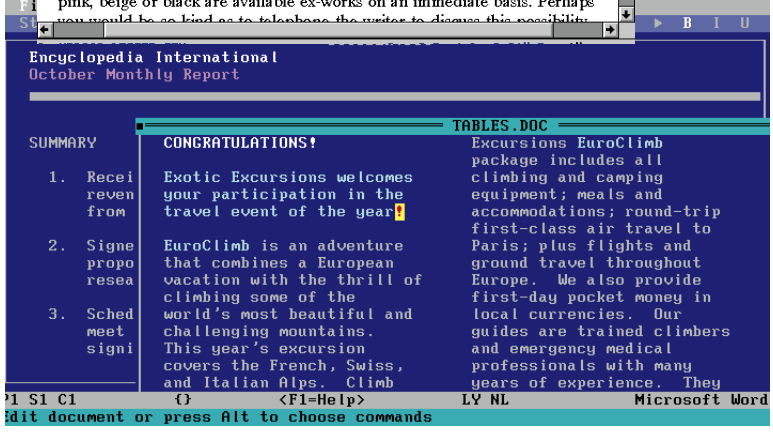
It's hard to see why anyone in possession of a reasonably recent PC would prefer to use a DOS word processor rather than a Windows one, but there are those who literally think WIMPs are for wimps. They mistrust mice, loathe button bars and spent so much effort in the late eighties learning obscure keystroke combinations that they are reluctant to admit there might be a better way. On the other hand, there is no law that makes the use of Windows compulsory, and the principal attraction of DOS applications is that they are far less hardware-intensive.





(Above) **Collector's item: WordPerfect for DOS 5.1 has achieved classic status and runs on any PC**
(Left) **WordPerfect 6.0 for DOS moves onto a more GUI level and is highly featured**

Microsoft Word 6.0 for DOS, though it doesn't share a file format with the Windows version, does offer a remarkably similar look and feel, in a sort of chunky character-based way. You get multiple document windows, similar menus, a formatting ribbon with drop-down lists of font attributes and styles, and drag-and-drop editing.



Microsoft Word 6.0 for DOS: like Windows, in a chunky character-based sort of way

There's even TrueType font support, and although you don't "see what you get", a graphics mode gives some simulation of italic and bold styles. There's an outliner and a table editor, and a somewhat limited macro facility. It will work on any PC with 512Kb of memory.

Over in the WordPerfect camp, there are two options. WordPerfect 5.1 is the collector's version, a computing classic that runs on any PC. It supports scalable fonts, and like the DOS version of Word, there's a quasi-graphic view with different screen fonts visible in bold and italic styles.

On a more GUI level, WordPerfect 6.0, although far more hardware-intensive, has a very similar look to the Windows 3.1 version and is similarly highly-featured. You get WYSIWYG editing, text wrap around graphics, and practically everything in the Windows 3.1 version with the exception of TextArt and drawing tools. It is depressingly slow and, given its hardware requirements, it's hard to see why anyone would prefer it to the Windows version.

LocoScript Pro 2 has its own little niche in history, being a direct descendant of the hugely successful word processor-cum-operating-system bundled with the Amstrad PCW. It has its own file management system and features scalable fonts and black-and-white illustration. Although, like the original, it will run from a floppy disk on any PC, the graphic options need a 286 with a hard disk.

•PCW Summary

Word 6.0 for DOS

Good Points Simple, low hardware requirements.

Bad Points Not WYSIWIG, not file-compatible with Windows version.

Conclusion The most user-friendly of the DOS options.

Contact Microsoft 0345 002000

Price Around £200 (plus VAT)

LocoScript Pro 2

Good Points Easy transition for Amstrad PCW users.

Bad Points Woefully old-fashioned in terms of features.

Conclusion A cheap DOS solution for modest hardware.

Contact Locomotive Software 01306 740606

Price £59.95 (plus VAT)

WordPerfect 5.2 - DOS

Contact Corel 0800 973189

Price Around £200 (plus VAT)

Good Points The classic version.

Bad Points Not for wimps.

Conclusion Fast and powerful on minimal equipment.

WordPerfect 6.0 - DOS

Contact Corel 0800 973189

Price Around £200 (plus VAT)

Good Points Almost as GUI as the Windows version.

Bad Points Slow and hardware intensive.

Conclusion A poor compromise between 5.2 simplicity and Windows luxury.

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Performance results. *All times in seconds*

Product	Accent	Fine Words	Word 7	Word Express 2	Universal Word 6.2	WordPerfect 7	Word Pro	WordStar 2
Load self	6.8	6.8	9.7	12.0	6.6	10.5	28.1	16.1
Load 240Kb text	6.9	1.5	1.8	2.1	579.0	3.9	7.0	7.9
Search/Replace	1.5	failed	1.0	2.0	9.9	2.5	0.8	3.1
Spelling check	35.0	8.2	0.4	12.3	11.2	1.2	10.5	22.9
Print - control back	failed	6.1	2.0	6.2	34.1	4.2	16.2	10.7
Print - printing starts	failed	3.2	3.6	4.1	14.8	5.6	14.3	2.3
Save in native format	2.4	2.4	2.3	1.2	2.8	1.6	3.5	1.9

A MAGICAL MYSTERY TOUR

Microsoft has Wizards, WordPerfect has Experts and Lotus has SmartMasters. So what are they? Wizardry comes in at several levels, but Microsoft's document Wizards are an extension of templates. When you create a new Wizard-based document, the template runs an automatic macro. This guides the user through a set of questions and answers. Typically, it might be "What style do you want your newsletter — Classic, Modern or Jazzy?", followed by prompts for things such as a title or a month. Having gathered all the relevant information, the user sits back while the Wizard chugs away creating the document. When this is finished, the user fills in the blanks or replaces dummy text with their own.

WordPerfect's Experts work slightly differently. You see the document template as soon as you start, but all the normal menus and buttons disappear as you fill in the answers to the questions. Once the process is complete, the "Expert" restores the rest of the interface and you're left with the full panoply of tools to complete the document.

Lotus' SmartMasters are simpler, as there are no question-and-answer routines and you choose a template from a series of previews. This is filled in, where appropriate, with your own name and address. When the document appears, it contains a number of "Click here" blocks. These can run macros,

Word games

So what will we be writing about in next year's group test? Or, more interestingly, in five years' time? There will undoubtedly be more internet-related stuff in the short term, as everyone and their dog seeks to create their own web pages. With other electronic documents, both Lotus and WordPerfect have strong contenders with Acrobat and Envoy.

There will be much more smart stuff, and there is still much room for improvement in proofing. With the exception of WordPerfect and Accent, all the spelling checkers had trouble with run-together words, or spaces missing after punctuation. Similarly, all grammar checkers still leave much to be desired. We should be seeing proofing tools that *know* the difference between there and their or it's and its.

The most bizarre and antiquated part of any word processing system is the keyboard. We're still using a layout that was introduced over 120 years ago with the express purpose of slowing down the user so the machine wouldn't jam. Somehow it stuck, but as computers get smarter, its days are surely numbered. Voice recognition is at present expensive, both in terms of the software and the necessary hardware, but it is becoming more accurate and not just an option for those who are physically unable to use a keyboard.

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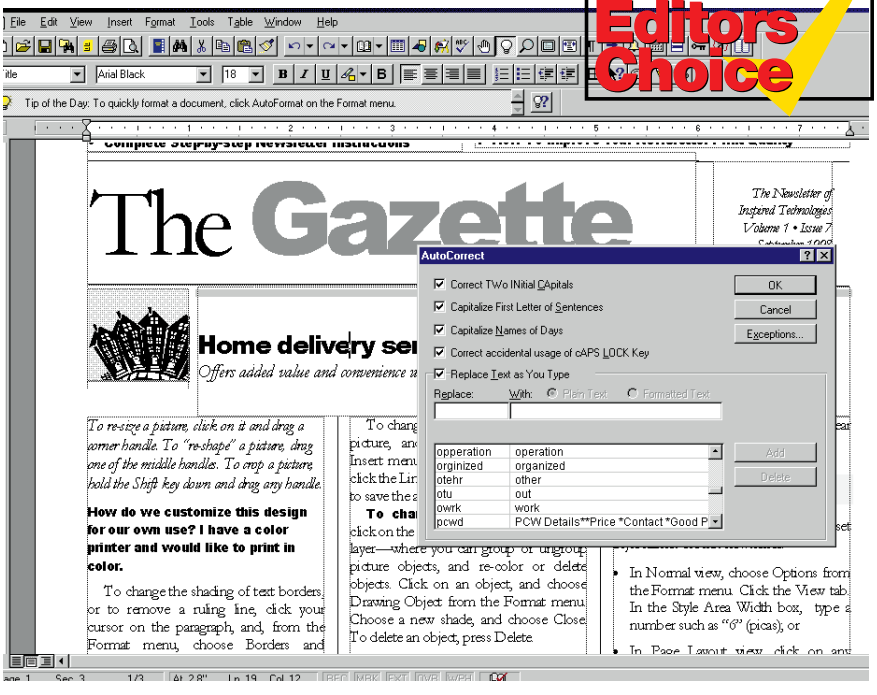
EDITOR'S CHOICE

Personal Computer World Editors Choice

Over the last few years we've seen fewer applications fighting over a growing market. Word processors such as the lightweight but excellent QA Write and Lotus Write are no longer being marketed. But that doesn't mean to say that the budget end is moribund. Toplevel Fine Words' blatant lack of features will endear it to those too busy for a long learning curve, and the shareware Word Express offers excellent value. Of the under-£50 packages, WordStar, last year's winner, still offers the most in terms of sheer features-per-pound, but Softkey doesn't appear to be interested in developing it further.

If you're looking for a specialist product for multilingual word processing, then Accent knocks spots off its rival The Universal Word, in terms of value for money. However, if you're staying with western languages, Word Pro's multiple versions and proofing tools make it excellent value.



And the winner is... Microsoft Word 7.0 — consistency, performance and ease of use

At the top end, each of the three heavyweights has its strong points. The ideal word processor doesn't exist, but if it did, it would have Word Pro's workgroup features, document management, "Infobox" and price. Combined with this would be WordPerfect's tabling, spelling checking, typographic, drawing and image-processing capabilities. Neither of these, however, is the best all-rounder. That distinction goes to our Editor's Choice, Microsoft Word 7.0, which is several lengths in front of the nearest rival. Its strength is that it manages to combine a huge range of features without sacrificing performance or ease of use. Its consistent interface, combined with the wealth of help for new users, makes it the most painless route into high-powered word processing.

Grab the bull by the horns

Early versions of Windows came with Dynamic Data Exchange (DDE). By using the "Copy" command in a spreadsheet, followed by the "Paste Link" command in a word processor, the pasted data would be linked to the remote file. If the latter were altered, then the linked data would be automatically updated each time the WP file was opened. DDE also provided programming tools for application interaction, such as retrieving information from a remote source or sending commands and data to another application. The latter is still very much alive, and, although the nearest non-developers will come to it via their word processor's macro language, it's not difficult to create a DDE link that can, for example, add the total of a word-processed invoice to a spreadsheet ledger.

With Windows 3.1, Microsoft introduced OLE. This took the linking aspect further, with the introduction of "Objects" that could be "Linked" or "Embedded" in a document. This is a common standard whereby the container, or "client" document, typically a word processor file, can hold spreadsheets, graphics, or even multimedia items from "server" applications. Embedded objects are saved as part of the file, the "all in one place" solution for portability, while linked objects stay as a reference to a separate file. This is useful when many files include the same object, such as a business logo.

Double-clicking on the object launches the server application for editing. An advantage is that not only can major applications' objects be embedded in each other, but OLE servers or "applets" such as text-effects or graphing can be used by any OLE client. Version 2 of OLE brought a few cosmetic refinements, including drag-and-drop object insertion and "in-place" editing, where the tools and menus of the client application change temporarily to suit the selected object. Despite this versatility, OLE doesn't appear to have taken the world by storm, and we're still waiting for some promised features. Microsoft Word, for example, still won't search or proof an embedded Excel object.

At the time of writing, object-based technology looks set to expand. OpenDoc, the IBM/Apple-backed object technology, was about to begin beta-testing for Windows. Java, Sun's web-based object embedding, is becoming established, and Microsoft's ActiveX is making its début. These take the object idea further by offering a way for developers to build applications from component parts. For example, one spelling checker could serve all the text-enabled applications on a PC.

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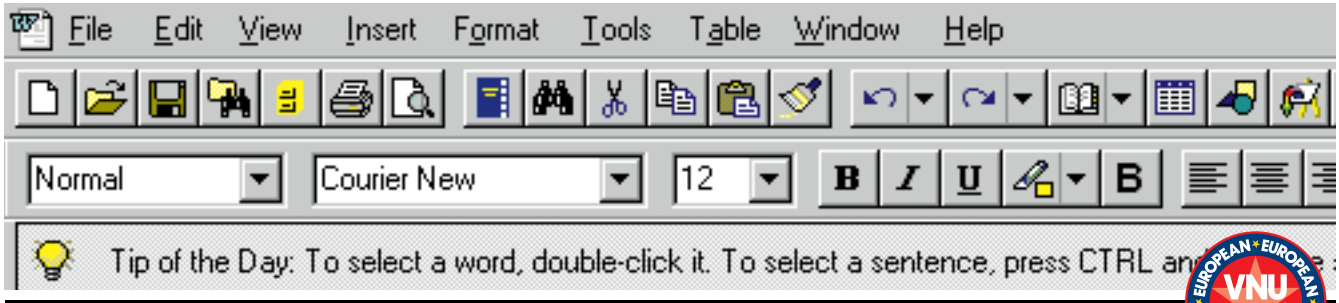
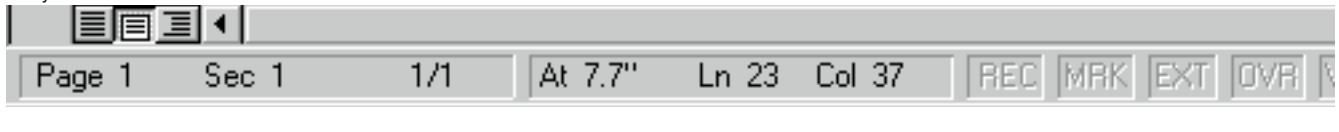


Table of Features

Product	Accent Professional 2.0	Toplevel Fine Words	Word 7	Word Express	Universal Word	WordPerfect 7
Distributor	Accent Software	Toplevel	Microsoft	Thompson Partnership	Prestige Network	Corel
Telephone	01923 208435	01453 753955	0345 002000	01889 564601	01344 303800	0800 973189
Price (ex VAT)	£230.00	£29.99	£200 (street)	£29.00	£399.00	£199.00
Platform(s)	Windows 3.1	Windows 3.1	Windows 95	Windows 3.1 and 95	Windows 3.1	Windows 95
Proc/Mem	386/4Mb	286/2Mb	386/4Mb	386/4Mb	286/2Mb	486/8Mb
Min/Max disk	12-50	5	16-36	10	22	36-70
WYSIWYG editing	●	●	●	●	●	●
Spelling checker	17 languages	●	●	● - additional languages available	● - additional languages available	●
Thesaurus	11 languages	●	●	●	●	●
Grammar checker	❍	❍	●	❍	❍	●
Word count	●	●	●	●	●	●
Autocorrection	❍	❍	●	❍	❍	●
Drag and drop editing	❍	❍	●	❍	●	●
Typefaces supplied	160	0	36	0	87	200
Styles	●	●	●	●	●	●
Mail-merge	●	●	●	●	●	●
HTML output	❍	❍	❍	●	❍	●
Macros	❍	❍	●	❍	❍	●
Drawing tools	❍	❍	●	●	❍	●
Text imports						
Word 6 (Windows)	❍	❍	●	●	●	●
Word 6 (DOS)	❍	❍	●	●	●	●
WordPerfect 6 (Windows)	❍	●	●	●	●	●
WordPerfect 5 (DOS)	●	●	●	●	●	●
WordStar (Windows)	❍	●	●	●	●	●
Ami Pro	❍	●	●	●	●	●
ASCII	●	●	●	●	●	●
RTF	●	●	●	●	●	●
Graphic Imports						
GIF	●	●	●	●	●	●
TIFF	●	●	●	●	●	●
BMP	●	●	●	●	●	●
CDR (CorelDraw)	❍	❍	●	❍	❍	❍
DXF (AutoCAD)	❍	❍	●	❍	❍	❍
CGM	❍	❍	●	❍	❍	●
PICT (Macintosh)	❍	❍	●	❍	❍	●
WPG	❍	❍	●	❍	❍	●
JPEG	❍	❍	●	❍	❍	●
Photo CD	❍	❍	●	❍	●	●

Key: ● Yes ❍ No



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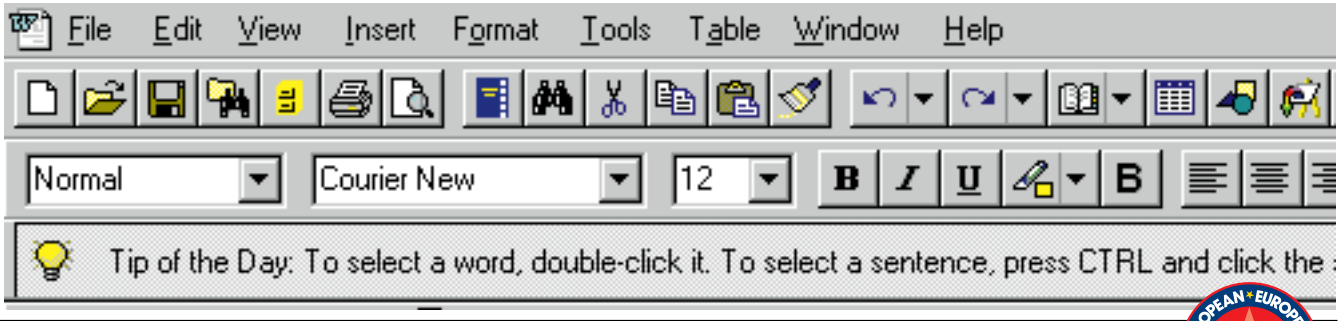
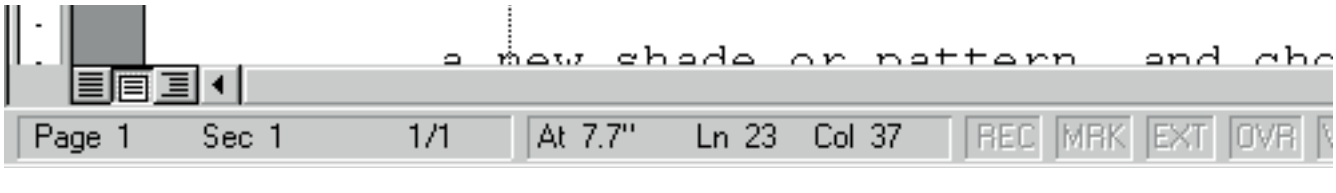


Table of Features

Product	Word Pro	WordStar 2 for Windows	LocoScript Professional	Word 6 for DOS	WordPerfect 6 for DOS
Distributor	Lotus Development	Softkey International	Locomotive Software	Microsoft	Corel
Telephone	0784 455445	0181 246 4000	01306 740606	0345 002000	0800 973189
Price (ex VAT)	£99.95	£42.51	£59.95	£200 (street)	£200 (street)
Platform(s)	Windows 95 and 3.1	Windows 3.1	DOS	DOS	DOS
Proc/Mem	486/8Mb	286/4Mb	8086/512Kb	8086/384Kb	286/480Kb
Min/Max disk	17-42	8-16	0.7-3.6	3-5.5	7-16
WYSIWYG editing	●	●	❍	❍	●
Spelling checker	● - ten languages	●	●	●	●
Thesaurus	●	●	●	●	●
Grammar checker	●	●	❍	●	●
Word count	●	●	●	●	●
Autocorrection	●	❍	❍	❍	❍
Drag and drop editing	●	●	❍	●	●
Typefaces supplied	44	0	5	14	55
Styles	●	●	●	●	●
Mail-merge	●	●	●	●	●
HTML output	❍	❍	❍	❍	❍
Macros	●	●	❍	●	●
Drawing tools	●	●	❍	❍	●
Text imports					
Word 6 (Windows)	●	●	❍	●	●
Word 6 (DOS)	●	●	❍	●	●
WordPerfect 6 (Windows)	●	●	❍	❍	●
WordPerfect 5 (DOS)	●	●	●	❍	●
WordStar (Windows)	●	●	❍	❍	●
Ami Pro	●	●	❍	❍	●
ASCII	●	●	●	●	●
RTF	●	●	❍	●	●
Graphic Imports					
GIF	●	●	❍	●	❍
TIFF	●	●	❍	●	●
BMP	●	●	❍	❍	●
CDR (CorelDraw)	●	❍	❍	❍	❍
DXF (AutoCAD)	●	❍	❍	❍	●
CGM	●	●	❍	❍	❍
PICT (Macintosh)	❍	❍	❍	❍	❍
WPG	●	❍	❍	●	●
JPEG	●	❍	❍	❍	❍
Photo CD	●	❍	❍	❍	❍

Key: ● Yes ❍ No



Group Test: Multimedia Notebooks

Multimedia on the move

Today's multimedia notebooks are more affordable and performing better than ever. Adele Dyer tests 14 of the latest carry-out crew.

There was a time, not so long ago, when notebooks lagged way behind desktop machines. They were slow, heavy, had limited functionality and were horrendously expensive compared to their desktop compatriots.

In the past year, notebooks have taken a great leap forward. Although prices have fallen dramatically for desktops, the price reductions are even more marked in the notebooks market. Many notebooks now offer multimedia capability as standard, while others have gone for slimline, lightweight designs with the multimedia capability built in to separate units.

The choice facing the prospective buyer is, for the most part, dependent on what they want from their machines. If you are going to be using the notebook away from mains power for long periods, then battery life should be your main consideration. Alternatively, if you want to carry a machine around a lot, you will want something lightweight. However, if you want all the functionality of your desktop on a notebook that can merely be shunted between home and work, then one of the cheaper all-in-ones will do the job.

We have looked at all these types of notebook here. The only criteria we set was for a Pentium 100 with 16Mb of RAM and a CD-ROM drive. As we were looking at the cheaper end of the market, many of the notebooks we requested for test came with DSTN (double supertwisted nematic) screens and smaller hard disks, although many manufacturers have take the great leap forward and gone for only TFT (thin film transfer) screens and 1Gb hard disks.

Multimedia Notebooks Contents

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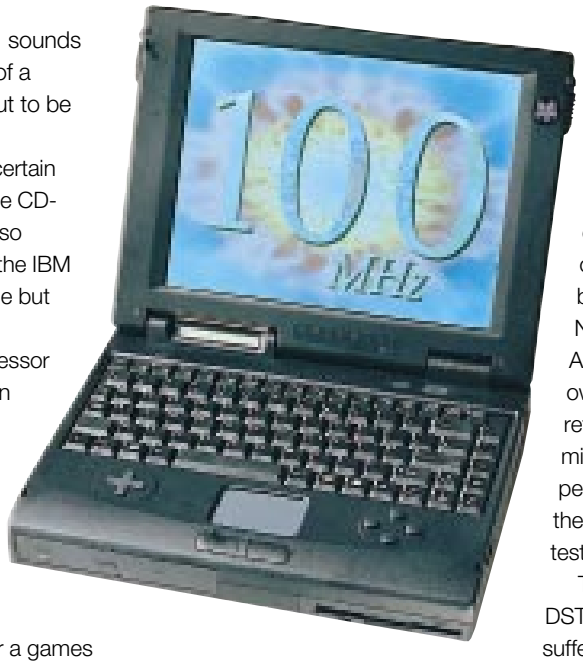
ACi Amethyst P100



The Amethyst, from ACi, sounds as if it should be a gem of a machine, but it turned out to be only semi-precious.

This notebook has a certain amount of modularity. The CD-ROM is not optional and so stays in place. Likewise, the IBM hard disk is not removable but is screwed firmly down. Upgrading both the processor and the RAM would be an easy task, as both are positioned beneath a screw-down panel. There were no free RAM slots, however.

The wrist rest has room for an in-built joypad, which is great for a games player but extremely annoying if you want to type on the machine. The ergonomics of notebooks, especially bulky ones like this, are such that it is difficult to type on them anyway, as the keys are not tilted as on a full keyboard so you are in particular need of a surface on which to rest the base of your wrists. If you put anything on this wrist rest, you are further disrupting the best position for your hands.

The performance of the Amethyst in our office application benchmark tests wasn't too bad, level pegging with the Viglen which costs over £250 more. The Corel test was good, as one would expect from the Cirrus Logic chip, but the Doom2 score was only reasonable. Nevertheless, the Amethyst held its own overall, returning a middling performance on the full range of our tests.

The 11.3in DSTN screen suffered from some flicker and bleeding but was otherwise relatively stable. The colour separation was good, though. It has 2Mb of VRAM to accelerate performance.

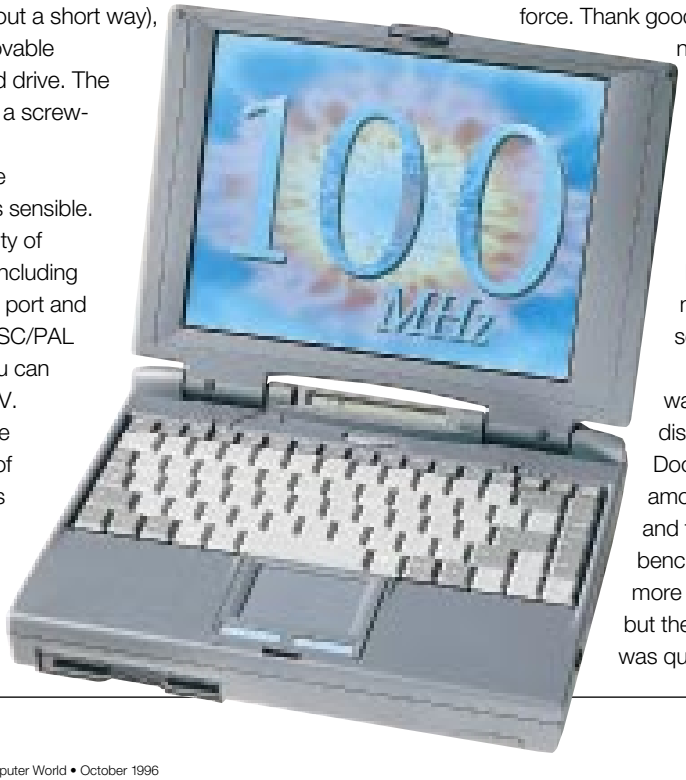
PCW Summary

ACi Amethyst P100

Software Bundle None.
Warranty One year BTB parts and labour, five years labour only.
Technical Support Lifetime telephone support.
Price £1,759 (plus VAT)
Contact 0181 830 1958. Fax 0181 830 1959
Good Points Good performance for the price.
Bad Points Over-springy keyboard. Muffled sound.
Conclusion Cheap, but no software included.

Software Bundle (n/a)
Build Quality ★★
Warranty ★★ 1/2
Overall Value ★1/2

Adams Accura Elite



The Accura Elite is one of those notebooks that can be classed as heavy but full-featured. Apart from the battery, none of the components are swappable. The NiMH battery is easy to swap out (the action of opening the door slides it out a short way), as is the removable Quantum hard drive. The RAM is under a screw-down lid.

All in all, the construction is sensible. There are plenty of connections, including IrDA, a games port and an internal NTSC/PAL adaptor so you can plug it into a TV.

Perhaps the worst aspect of this machine is the glidepad and mouse buttons. The former was a little oversensitive, but by contrast the mouse buttons were hard and unforgiving. Double-clicking on the glidepad resulted in the mouse point often sliding away from the desired icon, while depressing the mouse buttons fully meant using unnecessary force. Thank goodness there is a Windows 95 key to help you navigate by using keyboard strokes instead.

The DSTN screen is a large 11.3in, but then, size isn't everything. It's a little blotchy and blurred, and it suffered from bleeding. The definition isn't too bad and the colour quality is respectable, but overall it is not the best of screens.

Performance was a little disappointing. The Doom2 score was among the worst and the application benchmarks were no more than average, but the Corel score was quite acceptable.

PCW Summary

Adams Accura Elite

Software Bundle Windows 95.
Warranty One year back to base.
Technical Support Lifetime telephone support.
Price £1,599 (plus VAT)
Contact 0161 282 8822. Fax 0161 283 1001
Good Points TV port. Very cheap.
Bad Points Screen. Trackpad and mouse buttons.
Conclusion Has everything on it for a good price, but it's heavy and slow.

Software Bundle ★
Build Quality ★★
Warranty ★
Overall Value ★★ 1/2

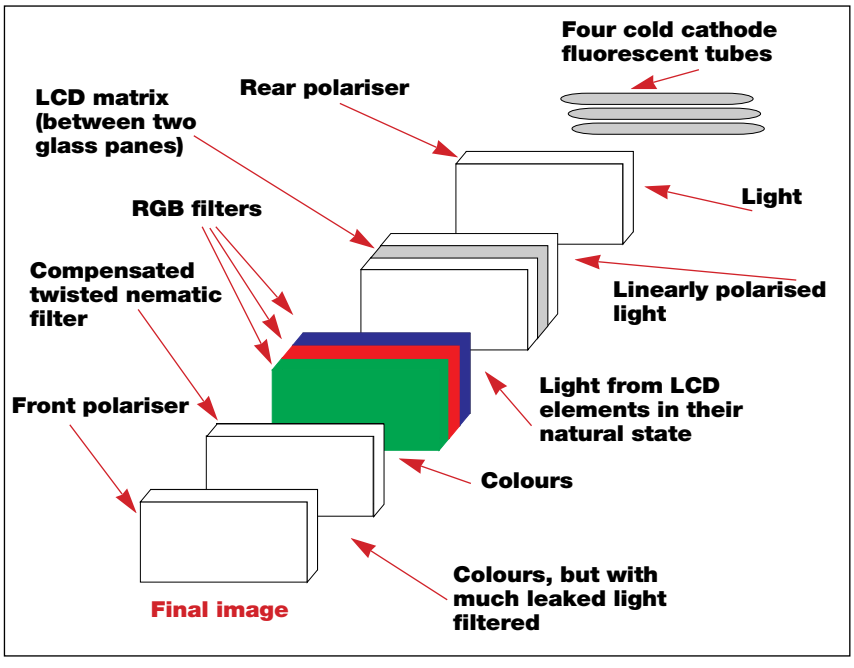
p190 ➢

Screens — TFT vs DSTN

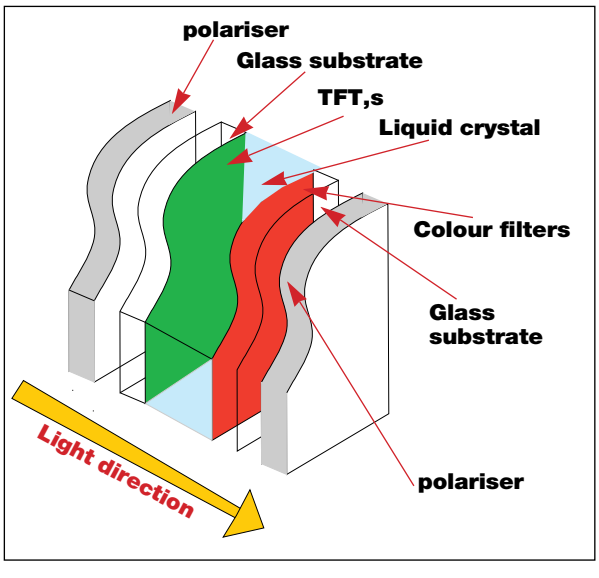
The screen is perhaps the most important part of any computer, whether desktop or notebook, but it is also one which is all too often neglected. As it is the part you continually look at when the machine is running, you owe it to your eyes to get a decent screen, should finances allow.

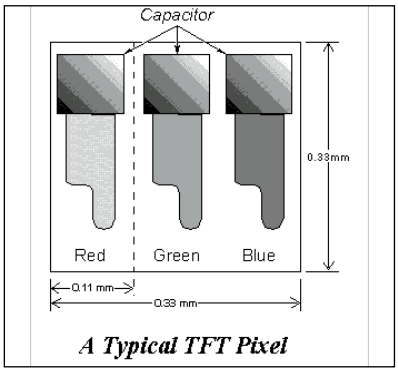
The two main choices are either thin film transfer (TFT) or double supertwisted nematic (DSTN). Each uses completely different techniques and, as a result, the quality of each is immediately discernable.

DSTN, or dual scan screens, are liquid crystal displays (LCDs). A thin layer of crystals are spread, pasted between layers of thin glass. Behind these is a grid of horizontal and vertical conductors, and each pixel is found at a point where these two conductors cross. Polarising filters control how the light passes through the screen. When the current is on, the crystals change orientation and the filters block out, making the pixels appear darker. Extra pixels and filters are needed to combine red, green and blue (RGB) which go together to form the colour spectrum, much like the pixels on your TV.



(Above) NEC passive colour display: how it works (Right) Structure of NEC TFT colour LCD



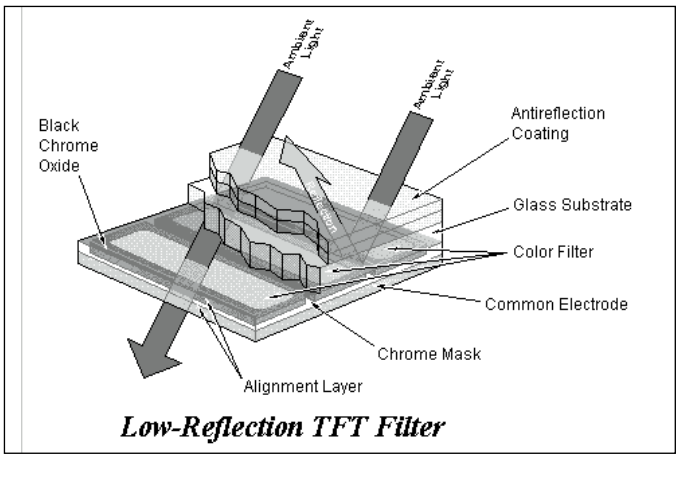


A Typical TFT Pixel

The main disadvantage of this technology is that it's impossible to turn on one pixel without affecting the others around it. This creates "crosstalk" and in turn produces bleeding and distortion. Contrast is reduced, the viewing angle is restricted, and colours are muted and less discernable.

TFT, also known as active matrix, is not an LCD. The same grid of conductors controls the current, but at each pixel there is a transistor which switches on or off depending on the current. Each pixel is therefore independent of its neighbours, leading to greater clarity and sharpness. Three sets of transistors are needed for RGB colour.

TFTs are thinner than LCDs, making them lighter, and refresh rates now approach those of CRTs as the current runs about ten times faster than on a DSTN screen. VGA screens need 921,000 transistors (640 x 480 x 3), while the new 1,024 x 768 screen from Toshiba needs 2,359,296 and each has to be perfect. The price differential over DSTNs, however, is still around the £300 mark.

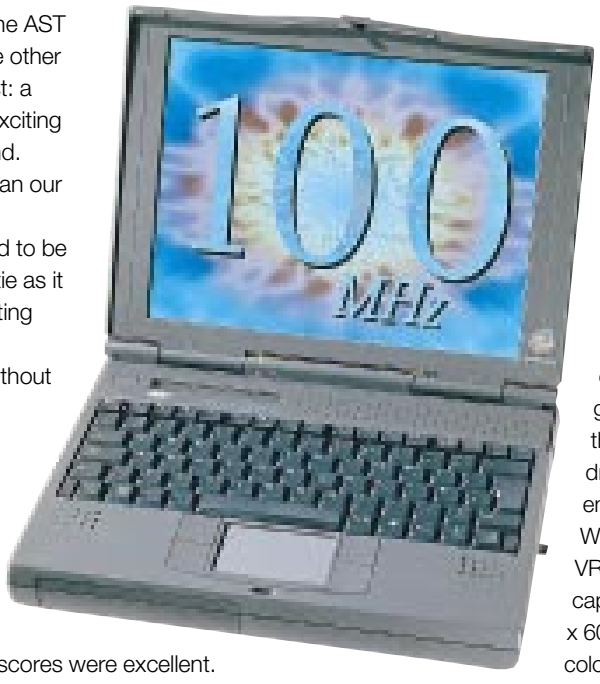


Low-Reflection TFT Filter

p192 ➢

AST Ascentia P31 P/100

Personal Computer World Highly Commended



On first inspection, the AST looked like any of the other notebooks in this test: a modular design, unexciting and really rather bland. However, when we ran our tests we were rather surprised: this proved to be quite a Linford Christie as it sprang from the starting blocks to win the benchmarks tests without even breaking into a sweat. Its office application benchmark score was far faster than any of the machines on test, and its Corel and Doom graphics test scores were excellent.

As for the machine itself, it is a familiar design. The CD-ROM drive and floppy are interchangeable, and pull out and push in without hitches, as does the battery. However, the removable hard drive was nothing of the sort: we couldn't shift it for love nor money.

The sound was of a typical notebook standard — a bit muffled, more like a mis-tuned mono radio than a stereo CD player. Add to this the constant rattle from the machine itself and you've got something which sounds a bit like riding a bicycle over gravel.

The screen was a reasonably large 11.3in TFT. It was pretty stable, with no moiré, bleeding or flicker. The colours were good, although they did tend to drop off at either end of the scale. With only 1Mb of VRAM it was capable of only 800 x 600 in 16-bit colour. The on-screen controls for brightness and contrast were good, though, with pop-up icons to show how far you had adjusted the screen.

PCW Summary

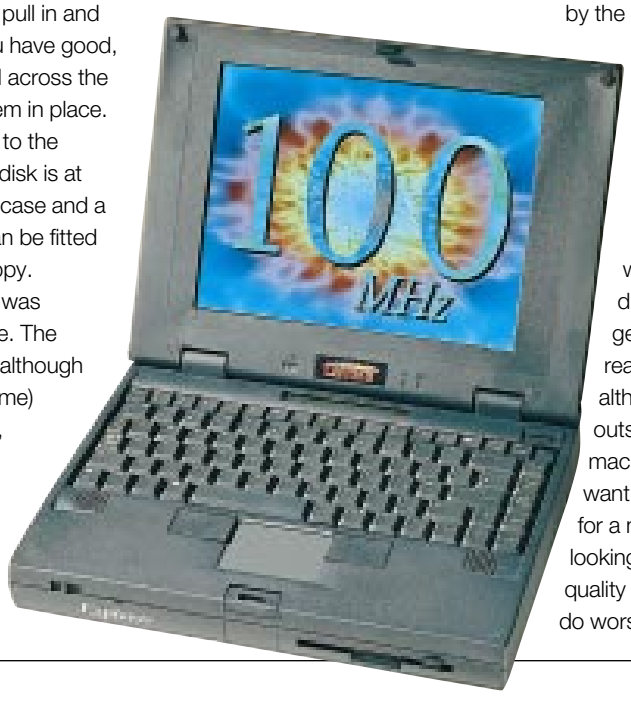
AST Ascentia P31 P/100

Software Bundle Windows 95 or Windows 3.11.
Warranty Three years RTB.
Technical Support Telephone and fax support. Execare service.
Price £2,799 (plus VAT)
Contact 0181 587 3000. Fax 0181 587 3303
Good Points Excellent performance.
Bad Points Sound. Sticky keyboard.
Conclusion For sheer performance, a worthy runner-up.

Software Bundle ★
Build Quality ★★★
Warranty ★★★
Overall Value ★★ 1/2

Carrera Explorer P100

Like most of the manufacturers featured in this group test Carrera does not make its own portables from scratch, and the Explorer is a rebadged Taiwanese model. It's a little more stylish than most rebadges and has a modular design.



The floppy and CD-ROM drives are easy to pull in and out as long as you have good, strong nails to pull across the button holding them in place. The same applies to the battery. The hard disk is at the bottom of the case and a second battery can be fitted in place of the floppy.

This notebook was comfortable to use. The wrist rest is large (although not as large as some) and the keyboard, complete with a Windows 95 key, has a good feel to it. The glidepad is smooth and easy to use but the mouse buttons are placed uncomfortably high up, on either side of the pad.

The sound from the tiny little speakers in the wrist rest isn't bad; it's just a bit like listening to a rock concert from half a mile away. There's a volume control knob on the side of the machine, by the audio connections.

The screen is a 10.4in TFT which is sharply defined and doesn't suffer from moiré or flicker. Although darker colours drop off the scale, colour definition is otherwise good.

Performance was somewhat disappointing but generally this was a reasonable, although not outstanding, machine. If you don't want to pay the earth for a notebook but are looking for certain quality criteria, you could do worse than this.

PCW Summary

Carrera Explorer P100

Software Bundle Windows 95, SmartSuite 96.
Warranty One year parts, three years labour.
Technical Support Lifetime telephone support.
Price £2,095 (plus VAT)
Contact 0171 830 0486. Fax 0171 830 0286
Good Points Good screen. Reasonable price.
Bad Points Tinny sound.
Conclusion Good machine, but surprisingly slow.

Software Bundle ★★ 1/2
Build Quality ★★
Warranty ★★
Overall Value ★★ 1/2

p196 ➢

Group Test: Multimedia Notebooks

Table of Features

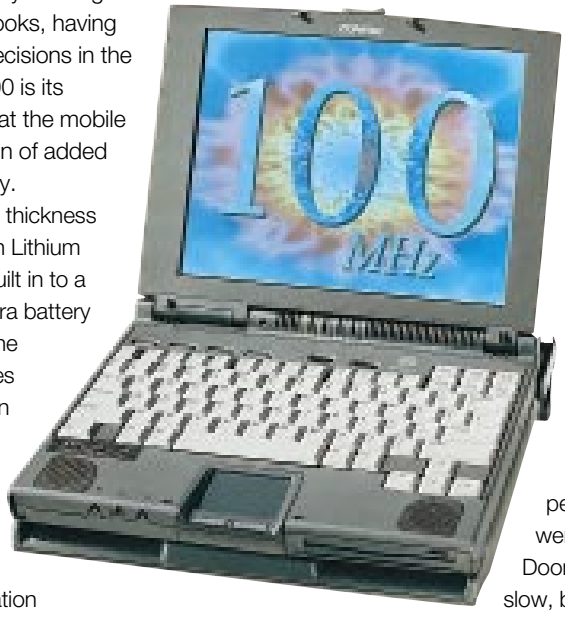
Manufacturer	ACi	Adams	AST	Carrera	Compaq	Dell	Digital
Model Name	ACi Amethyst	Accura Elite	Ascentia P31	Carrera Explorer	Armada 4110	Latitude XPi	Hi-Note Ultra II
	P100		P/100	P100		P100SD	LCTS 5100
Tel No	0181 830 1958	0161 282 8822	0181 587 3000	0171 830 0486	0990 134450	01344 720000	0345 227228
Fax No	0181 830 1959	0161 283 1001	0181 587 3303	0171 830 0286	0181 332 3409	01344 720001	0181 893 8889
Price (excl VAT)	£1,759	£1,599	£2,799	£2,095	£2,675	£2,143	£3,427
Basic Specification							
Processor	Pentium 100	Pentium 100 now P120	Pentium 100	Pentium 100	Pentium 100	Pentium 100	Pentium 100
Local bus rrchitecture	PCI	PCI	PCI	PCI	PCI	PCI	VL Bus
RAM supplied	16Mb	8Mb	16Mb	16Mb	16Mb	16Mb	16Mb
Maximum RAM	32Mb	40Mb	40Mb	70Mb	40Mb	40Mb	40Mb
L2 cache	265Kb	256Kb pipeline burst	256Kb	256Kb	256Kb	256Kb	256Kb
Hard disk	540Mb	810Mb	810Mb	810Mb	810Mb	540Mb	1.1Gb
FDD/CDD/ 2nd	FDD + MPEG	No	CDD + FDD	CDD + FDD	CDD + FDD	N/A	Yes
battery swapable?			+ Battery		+ opt battery		
Floppy disk drive (int/ext)	Int	Int	Int	Int	Int	Int	Ext / Modular
CD-ROM drive (int/ext)	Int	Int	Int	Int	Int in MCD	Ext	Ext / Modular
CD-ROM manufacturer	TEAC	TEAC	TEAC	TEAC	-	Panasonic	Toshiba
CD-ROM speed	6X	4X (6X)	6X	4X	4X	4X	6X
Type II PC card slots	2	1	2	1	2	2	2
Type III PC card slots	1	1	1	1	1	1	1
Video memory	2Mb VRAM	2Mb	1Mb	1Mb	1Mb VRAM	1Mb VRAM	1Mb VRAM
Pointer type	Trackpad	Trackpad	Smartpad Touchpad	Trackpad	Trackpad	Trackball	Trackball
Built-in joystick	Yes	No	Yes	No	No	No	No
16-bit sound capability	Yes	Yes	Yes	Yes (SoundBlaster)	Yes	Yes	Yes
Optional extras	Fax/modem, external	Fax/modem, ethernet,	Extra battery	Various	Various	-	-
	battery pack	mini-dock					
Connections							
Serial port (std/enh)	Enhanced	Enh	Enhanced	Enhanced	Standard	Enhanced	Standard
Parallel port (std/enh)	ECP/EPP	Enh	Enhanced	Enhanced	Enhanced	ECP	Enhanced
SCSI port	No	No	No	via PCMCIA	No	On port replicator	No
Ext conns	PS/2, VGA,	PS/2, VGA, audio,	VGA	Audio, VGA, PS/2,	TV, audio,	PS/2, VGA, audio in,	Audio, PS/2,
(key/VGA/mouse)	audio, midi	TV, midi		docking stn	expansion base i/face	audio out, mic	port replicator
IrDA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display type	DSTN	DSTN	TFT	TFT	DSTN	DSTN	TFT
Screen size	11.3	11.3	11.3	10.4	11.3	10.4	10.4
On-screen colours	256	256	64K	16 bit	256	256	64K
(800 x 600)							
On-screen colours	N/A	N/A	256	256	256	256	256
(1,024 x 768)							
Power Supply							
Battery technology	NiMH	NiMH	Li-Ion	Li-Ion	Li-Ion	Intelligent Li-Ion	Li-Ion
Claimed battery life	45 minutes	2-3 hrs	3hrs	2.5 hrs	3.5 hrs	4.5hrs	3 - 5 hrs
Claimed recharge time	2hrs	2hrs	2.5hrs	not stated	not stated	1hr	3hrs
Physical size							
Dimensions (WxDxH) cm	30 x 22.7 x 5.4	29.9 x 23 x 5.6	28.7 x 22.5 x 6.3	30.4 x 22.8 x 5.5	22.1 x 29 x 3.8	27.8 x 22.2 x 5.3	21.5 x 28 x 2.5
Weight with battery	3.5kg	3.2kg	2.9kg	3.5kg	2.8kg	2.8kg	1.8kg
Other							
Software Bundle	None	Win95	Win95 or	Win95,	Win95,	Win95,	Win95
			Windows 3.11	SmartSuite 96	LapLink	LapLink	
Basic warranty	1 yr BTB parts/labour	1 yr BTB	3 yrs RTB	1 yr parts,	3 yrs parts	1 yr collect	3 yrs RTB
	5 yrs labour only			3 yrs labour	and labour	and return	
Warranty options					Dealer dependent	up to 5 yrs on-site	N/A
							

Manufacturer	Dual	Evesham Micros	HM Systems	Olivetti	Mitac	Texas Instrum'ts	Viglen
Model Name	P5700	Evesham Vale	Minstrel XP 96	Echos P100E	SO24	Extensa 570	Dossier CD
		Voyager II	3CD			CDT	
Tel No	01223 576622	01386 765500	0181 830 1300	0181 785 6666	01952 207200	01784 212000	0181 758 7000
Fax No	01223 576859	01386 765354	0181 830 2300	0181 874 3014	01952 201216	01784 212662	0181 758 7080
Price (excl VAT)	£2,928, incl MO drive	£1,957	£2,044	£2,199	£1,625	£2,478	£2,297
Basic Specification							
Processor	Pentium 100	Pentium 100	Pentium 100	Pentium 100	Pentium 100	Pentium 100	Pentium 100
Local bus architecture	PCI	PCI	PCI	PCI	PCI	PCI	PCI
RAM supplied	16Mb	16Mb	16Mb	16Mb	16Mb	16Mb	16Mb
Maximum RAM	32Mb	64Mb	128Mb	40Mb	32Mb	40Mb	40Mb
L2 cache	256Kb	256Kb	256Kb pipeline burst	256Kb	256Kb	256Kb	256Kb pipeline burst
Hard disk	810Mb	1.3Gb	810Mb	510Mb	810Mb	1.2Gb	810Mb
FDD/CDD/2nd	FDD + CDD	FDD + CDD	FDD + CDD	CDD + FDD	CDD + FDD	CDD + FDD	n/a
battery swapable?	+ battery		+ battery				
Floppy disk drive (int/ext)	Int	Int or ext	Int	Int or ext	Int	Int	Int
CD-ROM drive (int/ext)	Int	Int	Int	Int	Int	Int	Int
CD-ROM manufacturer	TEAC	Panasonic	TEAC	TEAC	TEAC	KME	Toshiba
CD-ROM speed	4X (now 6X)	4X	6X	4X	4X	6X	4X
Type II PC card slots	2	2	2	2	1	2	2
Type III PC card slots	1	1	1	1	1	1	1
Video memory	2Mb VRAM	1Mb	2Mb VRAM	1Mb VRAM	1Mb	1Mb	1Mb DRAM
Pointer type	Trackpad	Trackpad	Trackpad	Pointpad	Touchpad	Trackpad	Trackpad
Built-in joystick	Optional	Built-in games port	Port	No	No	no	Games port
16-bit sound capability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Optional extras	fax/modem,	-	28,800 fax/modem	Battery, docking	CD-ROM	-	MPEG card, mini
	magneto optical drive			stn, car adaptor			docking stn
Connections							
Serial port (std/enh)	Enhanced	Enhanced	Enhanced	Standard	Enhanced	Enhanced	Enhanced
Parallel port (std/enh)	Enhanced	Enhanced	Enhanced	Enhanced	Enhanced	Enhanced	Enhanced
SCSI port	No	On optional docking stn	Optional	No	No	No	N/A
Ext conns	2 x PS/2, SVGA,	PS/2, VGA, audio,	TV, PS/2, VGA,	Audio, VGA, PS/2,	-	PS/2 / VGA	PS/2, VGA, docking
(key/VGA/mouse)	docking stn, audio	composite video and I/O	audio, docking stn	docking stn			stn, games port
IrDA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Display type	TFT	-	TFT	TFT	DSTN	TFT	DSTN
Screen size	12.1	10.4	11.3	10.4	10.4	10.4	11.3
On-screen colours	64K	256	256	16-bit	256	256	256
(800 x 600)							
On-screen colours	64K	-	-	256	-	-	256
(1,024 x 768)							
Power Supply							
Battery technology	NiMH	Li-Ion	NiMH	NiMH	NiMH	NiMH	NiMH
Claimed battery life	up to 4 hrs with 2nd battery	1 - 2 hrs	2.6hrs	3 hrs	1 hr 15 mins	not stated	1.5 hrs
Claimed recharge time	1.5 - 4 hrs	2 hrs	1.4 hrs	1 - 5 hrs	not stated	not stated	2 hrs
Physical size							
Dimensions (WxDxH) cm	29.7 x 25.2 x 5.6	29.5 x 22.5 x 5.6	299 x 230 x 56	29.3 x 23 x 5.5	28 x 22 x 4.6	29.5 x 22.8 x 5.6	29.9 x 23.2 x 5.5
Weight with battery	3.3 kg	3.1kg	3.2kg	3.7kg	2.7kg	2.9kg	3.7kg
Other							
Software Bundle	Win95 or	Win95	Win95,	Win95, Works 95,	Win95	Win95	Win95, Works 95,
	WfW 3.11 + DOS		SmartSuite 96	Easy Tutor Win95			Lotus Organiser 2
Basic warranty	I yr BTB	1 yr RTB	3 yrs labour,	3 yrs, 1 yr display	1 yr RTB	1 yr	1 yr RTB
			1 yr parts	and battery			
Warranty options	3 yrs RTB	2 yrs total	5 yrs	-	n/a	3 yrs	-
							

p199

Compaq Armada 4100

Compaq has completely rethought its approach to notebooks, having admitted some bad decisions in the past. The Armada 4100 is its slimline model, aimed at the mobile user but with the option of added multimedia functionality.



To keep weight and thickness to a minimum, the main Lithium Ion battery has been built in to a carrying handle. An extra battery can be swapped into the floppy slot. The batteries and the floppy drive can be warm-plugged: that is, swapped while the notebook is running in standby mode.

The skinny multimedia docking station (MCD, or Mobile CD unit) contains a second set of speakers, space for a third battery and the CD-ROM drive. The latter should become an eight-speed model by the end of this year. There are a number of screws to keep it securely fastened but the release mechanism on the one we saw was a little flimsy. The MCD features FM synthesis sound so it is clear, crisp, and positively blasts out through the extra speakers (the notebook itself has only 16-bit sound).

Zoom video is supported and there is an NTSC/PAL internal adaptor so you can connect the notebook to a TV. There is no CardBus support, however.

The DSTN screen on this model wasn't wonderful, producing some bleeding and flicker, but the on-screen brightness and contrast controls represent an improvement on most others.

The overall performance results were good. Only the Doom2 result was fairly slow, but this is a classic negative point of pre-production machines, of which this was one, where any problems in the BIOS have yet to be ironed out.

•PCW Details

Compaq Armada 4110
Software Bundle Windows 95, LapLink.
Warranty Three years parts and labour.
Technical support Toll line or through reseller.
Price £2,675 (plus VAT)
Contact 0990 134450. Fax 0181 332 3409
Good Points Light. Adaptable. Good-looking.
Bad Points May lack robustness in the long term.
Conclusion Technically innovative. An attractive buy.

Software Bundle ★★
Build Quality ★★★ 1/2
Warranty ★★ 1/2
Overall Value ★★★

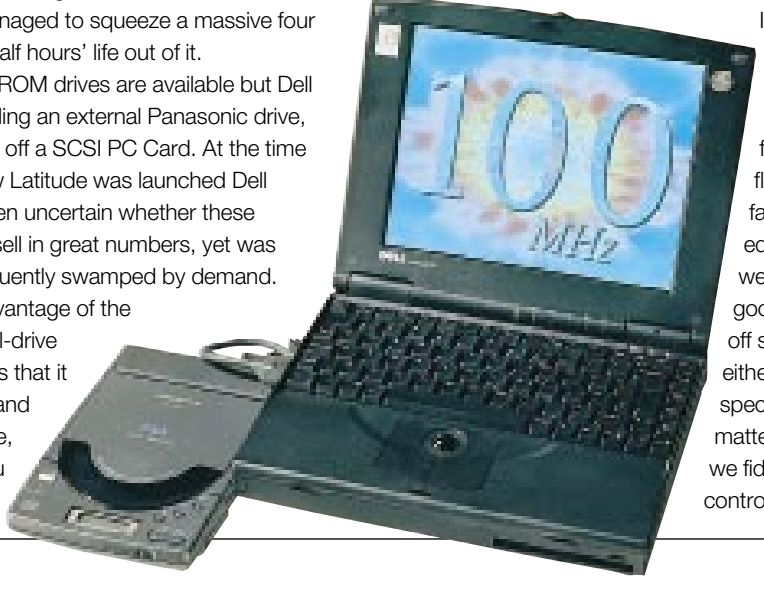
Dell Latitude XPi P100SD

Personal Computer World Editors Choice

Dell has gradually made a name for itself over the years as a producer of good-quality notebooks. This year's update of the Latitude range doesn't go in for fancy gimmicks — no multimedia docking modules or swap-in CD-ROM drives here. Instead, Dell has foregone external CD-ROM drives, arguing that they are too power hungry, and has chosen instead to concentrate on battery technologies and portability.

The battery in this machine, as in all the Dells, is Intelligent Lithium Ion, and Dell has managed to squeeze a massive four and a half hours' life out of it.

CD-ROM drives are available but Dell is bundling an external Panasonic drive, running off a SCSI PC Card. At the time the new Latitude was launched Dell had been uncertain whether these would sell in great numbers, yet was subsequently swamped by demand. The advantage of the external-drive model is that it is light and portable, and you don't have to battle swapping it in and out.



On the notebook itself, the speakers are quite impressive, and it was one of the few models here to produce a good, round, sound.

Its performance was one of the fastest in our tests. It was almost the fastest in our office application benchmark tests, as could have been predicted from the Latitude's good reputation. It is also excellent on the graphics side.

The DSTN screen was not one of the best we saw. In fact it was quite disappointing, and suffered from bleeding, flicker and fading at the edges. Neither were the colours good, dropping off seriously at either end of the spectrum no matter how much we fiddled with the controls.

•PCW Details

Dell Latitude XPi P100 SD
Software Bundle Windows 95, LapLink.
Warranty One year collect and return. Option of up to five years, on-site.
Technical Support Lifetime telephone support (24hrs, every day).
Price £2,048 (plus VAT)
Contact 01344 720000. Fax 01344 720001
Good Points Long battery life. Good sound.
Bad Points External CD-ROM drive.
Conclusion A nice little mover — our Editor's Choice.

Software Bundle ★★
Build Quality ★★★
Warranty ★★★ 1/2
Overall Value ★★★

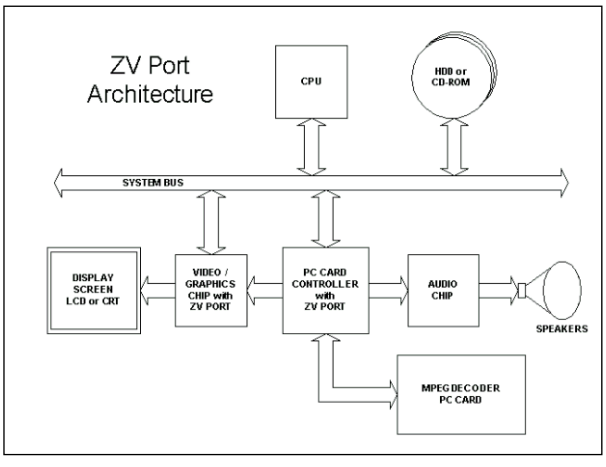
p200 ➢

PC Cards Standards

PCMCIA (Personal Computer Memory Card Industry Association), or PC Cards as they are now known, are quite simply little credit card-sized cards which plug into your notebook, expanding its functionality. They are OS and device independent, self-configuring and hot-pluggable: that is, they will be detected and initialised ready for use while the machine is running. Fax-modem PC cards are commonplace, and there are PC Card hard disks, SCSI connectors, Ethernet and ISDN adaptors, and data cards.

A couple of new PCMCIA standards have been introduced and are beginning to appear on the latest crop of notebooks: Zoom Video and CardBus are aimed at the divergent markets of multimedia and high-speed comms.

Zoom Video gives you full-screen, full-motion video with video data transmission rates of up to 27Mb/sec. It gains its edge by bypassing the main PCI bus and the CPU and talking directly to the graphics chip, so ensuring that the performance of the rest of your machine is not hit too hard. You need a modified graphics controller and PC Card controller, and a motherboard connection between them to support the standard and which can play both MPEG1 and MPEG2 video. The results are impressive.



The flow of data in Zoom Video Port Architecture

Compressed video data flows from the hard disk, CD-ROM or other source across the system bus to the PC Card controller and then to the MPEG decoder in the PC Card slot. Uncompressed video data is then returned to the PC Card controller, which in turn sends it on to the graphics controller and the audio chip, and so to the display and the speakers. This cuts out the need to send uncompressed video data along the system bus.

CardBus is a 32-bit extension of the 16-bit PC Card peripheral interface. It supports data throughput rates of up to 132Mb/sec. It supports Zoom Video, but the main function is likely to be high-speed network communication. However, the advantage of having CardBus on your machine is of limited usefulness at present as there are so few cards on the market that support it, but provided this becomes the prevalent standard it does offer a certain degree of future-proofing.

IrDA (Infra-red Data Association) technology

The principle behind IrDA is simple: it plans to replace the mass of wiring which currently constitutes office networks and replace it with low-cost, low-power infra-red links adaptable to a range of appliances and devices. So instead of being linked to your network printer by a length of coaxial cable, you can simply walk up to it, point your notebook at it and print off your documents.

Hewlett-Packard (H-P) first developed Serial Infrared (SIR) and then set up the IrDA, which now has over 100 partners, including chip makers and computer and printer manufacturers.

It is a cheap addition to any peripheral. It uses standard parts used in serial ports, and an infra-red LED which flashes on and off at incredible speed: enough to transfer at a speed of 115bps. Faster transfer rates of 1.5Mb/sec and 4Mb/sec are likely to become common in the near future.

All the notebooks we tested were fitted with an IrDA connection

Sharp and NEC have already adopted 4Mb/sec, or FastIR, as the standard on their new notebooks.

As a line-of-sight mechanism, two problems still exist. Firstly, you need to be close to your peripheral for it to work: you can be up to three metres away, although H-P recommends you are within a metre of the peripheral and within a 30 degree angle of the receiver. Secondly, there is nothing to stop snoopers intercepting the signal and sneaking a look at your work, although there is encryption software to limit the risk.

This time last year, very few notebooks were equipped with IrDA — it was viewed very much as an emerging technology. Yet now, all the notebooks in our group test came fitted with IrDA, although the standard has not, as yet, migrated to many other peripherals: it is a rare commodity even among printers. But you can expect to see more of it in the future, perhaps in a form such as Hewlett-Packard's NetbeamIR, a network link box currently only on sale in the US.

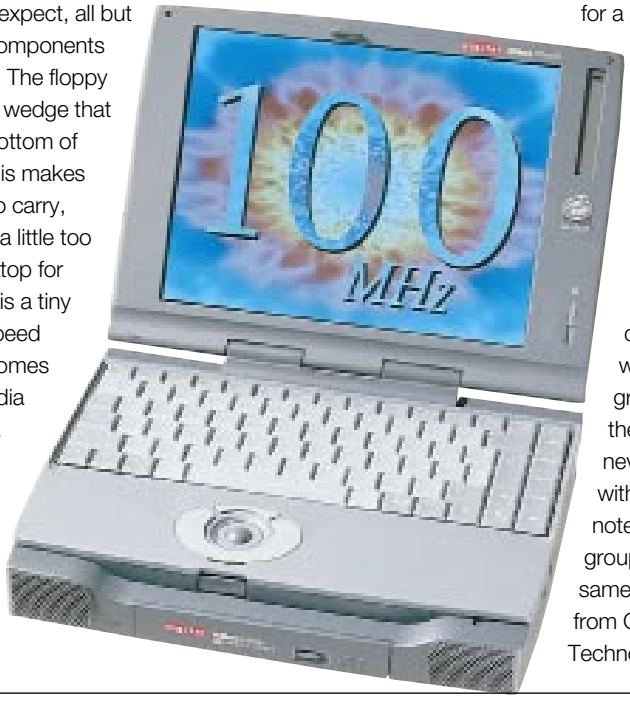
p203 ➢

Digital Hi-Note Ultra II LCTS 5100

Personal Computer World Highly Commended

The Digital Hi-Note Ultra II is the Kate Moss of the notebook world — it weighs in at an anorexic 1.8kg and is a very skinny 25mm thick.

As you might expect, all but the most basic components bolt on as extras. The floppy drive is in a small wedge that locks on to the bottom of the notebook. This makes one more thing to carry, and the floppy is a little too close to the desktop for comfort, but this is a tiny niggle. The six-speed CD-ROM drive comes in a separate media docking station a mere 2cm thick and weighing 0.9kg. Extra speakers are fitted to this, so the sound really does blast out.



The battery is in the bar at the back of the notebook which also acts as a stand on which to tilt the machine. There is room for a second battery, as well, in the media module.

The screen is a small but perfectly formed 10.4in TFT. It can be pushed to 1,024 x 768 in 256 colours and the only real problem is a slight lack of distinction in the colours.

Performance was more than respectable. Its Doom score was good, as were the benchmark scores, which is where it really matters. Its only disappointing result was from the Corel graphics test, but the mark was nevertheless in line with all the other notebooks in the group which use the same graphics chip from Chips & Technologies.

PCW Summary

Digital Hi-Note Ultra II
Software Bundle Windows 95.
Warranty Three years return to base.
Technical Support Lifetime telephone support.
Price £3,427 (plus VAT)
Contact 0345 227228.
Fax 0181 893 8889
Good Points Portability. Adaptability.
Bad Points Some may find it annoying to have to carry so many extra bits.
Conclusion Gorgeous, but a bit pricey.

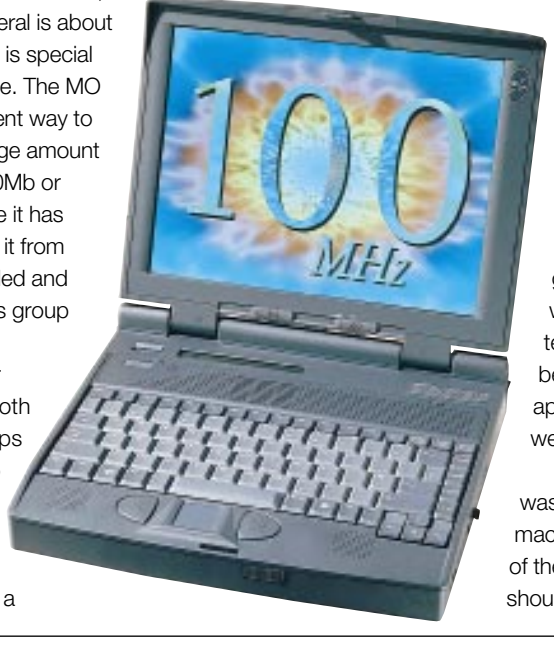
Software Bundle ★
Build Quality ★★★★
Warranty ★★ 1/2
Overall Value ★★ 1/2

Dual P5700

Dual Technologies claimed that this notebook was the first on the market with a magneto optical (MO) drive; in fact, Panasonic launched a notebook which incorporates its own PD drive at very much the same time.

Although the Fujitsu MO drive can be swapped for a conventional CD-ROM drive, this added peripheral is about the only thing that is special about this machine. The MO drive is a convenient way to carry around a large amount of data, either 230Mb or 640Mb. Otherwise it has little to distinguish it from many of the bungled and the botched in this group test.

The processor socket accepts both 3.5v and 2.9v chips so it's possible to fit as much as a P166 processor if you really want to put a power-hungry desktop chip in a notebook. To get at the chip, you simply lift off the grille between the screen and the keyboard and carefully tease it out. The RAM slots can be reached by the same method. The chip-under-the-grille approach may mean it is cool enough, but it rattles like a can of dried peas.



The best thing about this notebook, however, is the big 12.1in TFT screen. It can pump out an impressive 1,024 x 768 in 16-bit colour and is as clean as a whistle — and so it should be, with 2Mb of VRAM.

Performance wasn't good. The Doom score was poor and the Corel test result was average, at best. The all-important application benchmarks were terrible.

To be fair, though, this was a pre-production machine and the performance of the final production model should be better.

PCW Summary

Dual P5700
Software Bundle Windows 95 or Windows for Workgroups 3.11 and DOS.
Warranty One year back to base. Optional extra three years return to base.
Technical Support Telephone and fax.
Price £2,928 incl. the MO drive (plus VAT)
Contact 01223 576622.
Fax 01223 576859
Good Points Magneto optical drive. Screen.
Bad Points Noisy. Cheesy.
Conclusion Worth considering only if you are desperate for an MO drive.

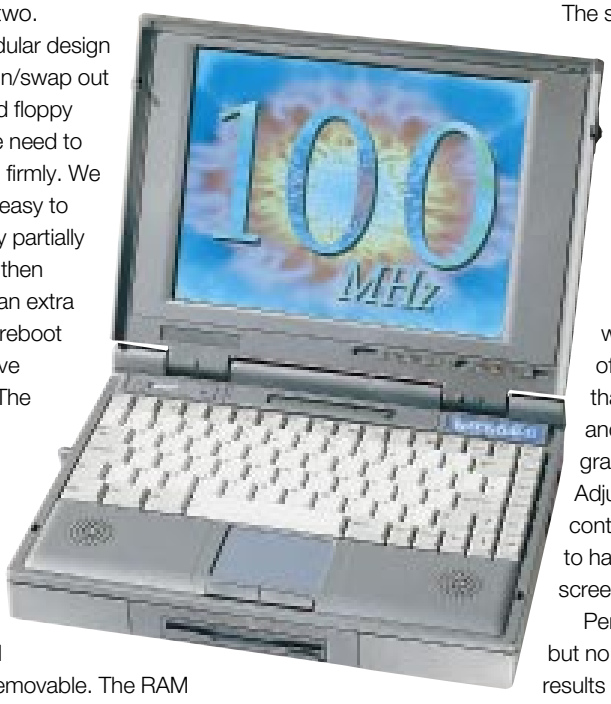
Software Bundle ★
Build Quality ★ 1/2
Warranty ★ 1/2
Overall Value ★

p204 ➢

Evesham Vale Voyager II

"Robust" and "sturdy" are two words which immediately spring to mind when talking about the Evesham. "Solid" and "heavy" are another two.

It is a modular design with a swap in/swap out CD-ROM and floppy drives. These need to be pushed in firmly. We found it very easy to get them only partially inserted and then have to give an extra shove and a reboot to get the drive recognised. The Lithium Ion battery, by comparison, is very easy to get in and out. The Toshiba hard disk is non-removable. The RAM is directly beneath a slot which can easily be snapped off: I wouldn't fancy my chances at hanging on to my RAM under such an easily-removed cover.



The sound positively blasts out: it sounds a little tinny at full volume, though. The two decent-sized speakers are on the wrist rest — a rather inconvenient place for them.

The glidepad feels a little sticky and the buttons are not ideally placed, tilted down at an angle on the edge of the notebook. Some may find this uncomfortable, but then, the position of mouse buttons is never going to be ideal for everyone.

The DSTN screen was not a good example of its type. It suffered more than most from bleeding and flicker, and had a grainy appearance. Adjusting the brightness and contrast knobs didn't seem to have a great effect on the screen.

Performance was average but no more, and the test results were respectable but not outstanding.

PCW Summary

Evesham Vale Voyager II
Software Bundle Windows 95.
Warranty One year return to base.
Technical Support Telephone and fax. BBS.
Price £1,957 (plus VAT)
Contact 01386 765500. Fax 01386 765354
Good Points Robust. Good sound.
Bad Points Screen.
Conclusion An average notebook.

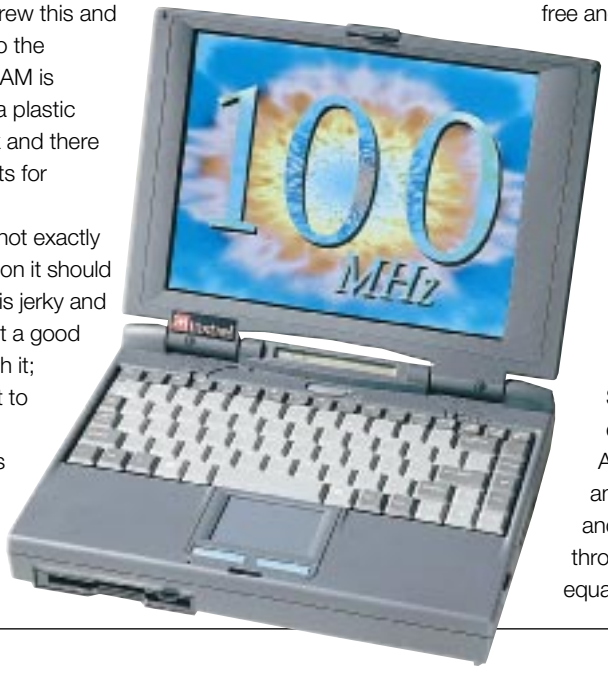
Software Bundle ★
Build Quality ★★
Warranty ★
Overall Value ★★ 1/2

HM Systems Minstrel XP 96 3CD

The HM Systems Minstrel is actually the same rebadge as the Adams. The company has packed everything into a single case and bypassed the modular route: only the Quantum hard drive is removable.

The interior components are reasonably easy to get at. The keyboard lifts off to reveal a metal plate: unscrew this and you get straight to the processor. The RAM is located beneath a plastic plate on the back and there were two free slots for upgrading.

The mouse is not exactly the aid to navigation it should be. The glidepad is jerky and you need to give it a good wallop to click with it; and, you will want to avoid using the mouse buttons as they are not only awkwardly positioned but, to add insult to possible injury, are also extremely stiff.



On the sound front, the Minstrel did not live up to its name. It was more like a troubadour stuck at the bottom of a well than aloft in the minstrel's gallery.

However, the 11.3in dual-scan screen made up for all the other little annoyances. Powered by 2Mb of VRAM, it was flicker free and did not suffer too badly from the problems of moiré and flicker usually associated with DSTN screens.

Performance was middling but, like the Adams, it fell down badly on the Doom tests, scoring only 23 frames per second. To balance this, however, its Corel score was acceptable.

Although the HM Systems is more expensive than the Adams, you do get an extra 1Mb of VRAM and Lotus SmartSuite thrown in to the equation.

PCW Details

HM Systems Minstrel
Software Bundle Windows 95, Lotus SmartSuite
Warranty Three years labour, one year parts. Optional extra five years.
Technical Support Lifetime telephone support.
Price £2,044 (plus VAT)
Contact 0181 830 1300. Fax 0181 830 2300
Good Points Screen. TV support.
Bad Points Heavy. Bad mouse.
Conclusion A good deal if you can stand carrying that much weight.

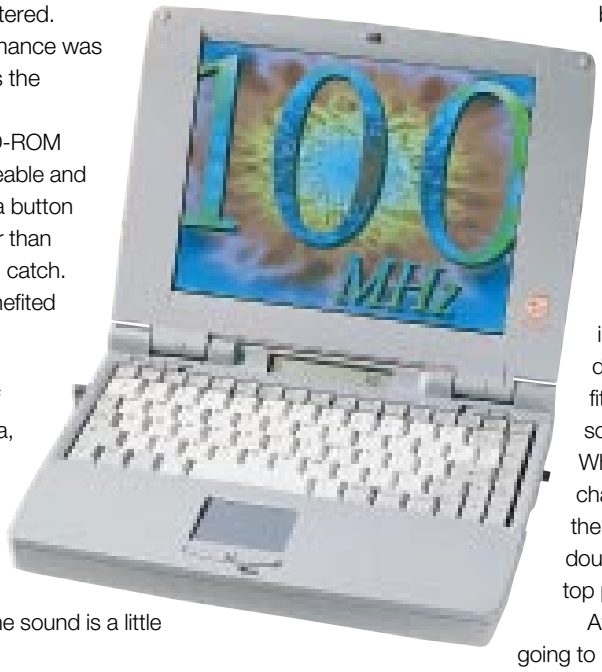
Software Bundle ★★ 1/2
Build Quality ★★ 1/2
Warranty ★★★
Overall Value ★★★

p206 ➢

Mitac SO24

On first look, the Mitac seemed as if it might turn out to be one of the better bargain notebooks. It has sleek, slim lines with a sloping wrist rest and its appearance is uncluttered. However, the performance was not as streamlined as the design.

The floppy and CD-ROM drives are interchangeable and come out easily with a button release system, rather than the more usual sliding catch. The machine also benefited from being quite light, weighing just 2.7kg.



Despite the lack of speakers on the fascia, the Mitac actually did put out sound. The speaker is positioned on the bottom and, as might be expected, the sound is a little thin to say the least.

Performance was disappointing: it was in the bottom section of those machines which performed only marginally better than a DX4/100. This is not Pentium standard and we really expected better. The poor performance in the office application benchmarks could be explained by the lack of Level-2 cache. However, the Doom2 and Corel test results were equally disappointing.

There were a few problems with the screen. It was originally set to run at 640 x 480. As we run all our tests at 800 x 600 in 256 colours, it was reset to this resolution. But it could only manage this as a virtual desktop: i.e. not all of the desktop can be fitted into the screen at once. When we tried to change back down, the screen went double and only the top part was filled.

At the time of going to press, Mitac was still looking into the problem.

PCW Summary

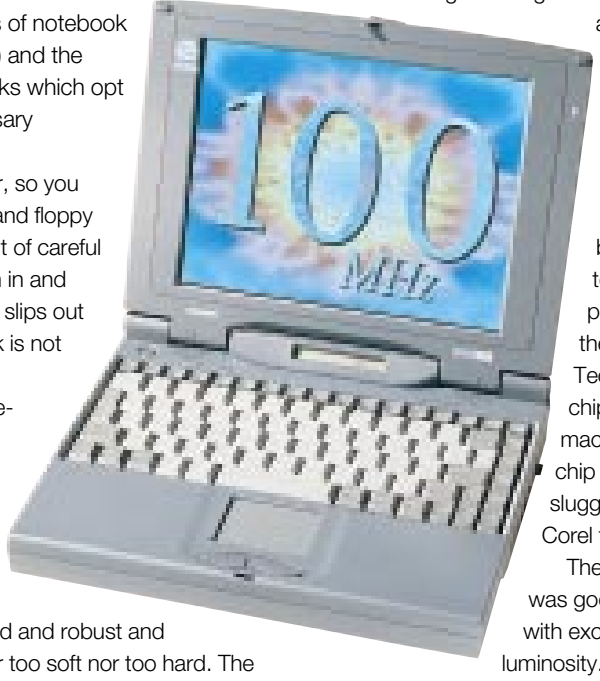
Mitac SO24
Software Bundle Windows 95
Warranty One year return to base.
Technical Support Lifetime telephone support.
Price £1,625 (plus VAT)
Contact 01952 207200. Fax 01952 201216
Good Points Sleek, lightweight design.
Bad Points Screen. Performance.
Conclusion Not a great performer but good for the price.

Software Bundle ★★
Build Quality ★★★
Warranty ★★
Overall Value ★★★★★

Olivetti Echos P100E

Weighing less than 3kg, the Olivetti sits between the larger class of notebook (fully-featured but heavy) and the lighter breed of notebooks which opt for only the most necessary components.

The design is modular, so you can swap the CD-ROM and floppy drives. These require a bit of careful manoeuvring to get them in and out but the NiMH battery slips out easily. The 1Gb hard disk is not removable and has been engineered so that "fiddle-fingers" cannot remove it out of curiosity. The RAM is beneath a screwed-down panel and there are no free slots.



This notebook felt solid and robust and the keyboard was neither too soft nor too hard. The glidepad moves smoothly and the buttons are sensibly placed.

There were a couple of disappointing features, though. The battery was NiMH, not, as you might expect, the lighter and longer-lasting Lithium Ion type. Sound quality was, sadly, small and tinny. In common with many of the notebooks in this group test, not enough attention has been paid to this particular aspect of multimedia. But why have a notebook for presentations if the sound is inadequate?

Performance was good in the application benchmark tests but less so in the graphics tests. This is probably due to the Chips & Technologies chip — all the machines with this chip performed sluggishly in our Corel test.

The TFT screen was good and sharp, with excellent luminosity. But the colours are not as sharply defined as they could be, dropping off at both ends of the scale

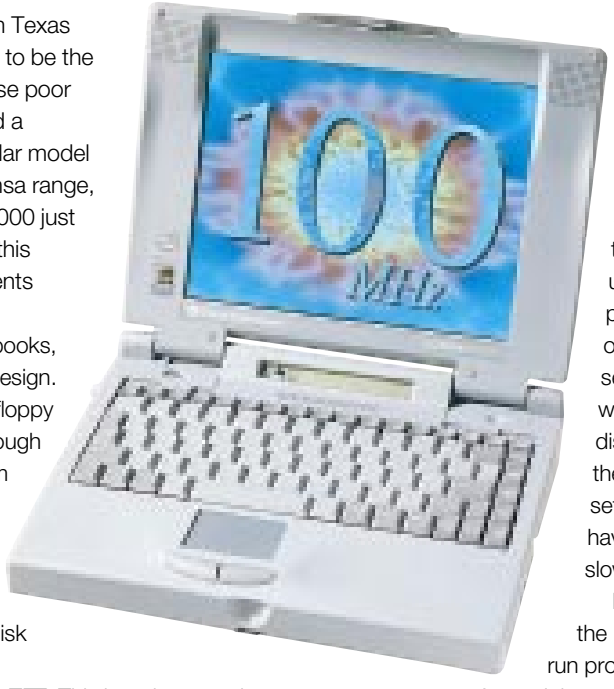
PCW Summary

Olivetti Echos P100E
Software Bundle Windows 95, Works 95, Easy Tutor Windows 95.
Warranty Three years. One year display and battery.
Technical Support Lifetime telephone support.
Price £2,199 (plus VAT)
Contact 0181 785 6666. Fax 0181 874 3014
Good Points Reasonably light. Good screen.
Bad Points Sound. Battery.
Conclusion A reasonably good deal.

Software Bundle ★★ 1/2
Build Quality ★★ 1/2
Warranty ★★ 1/2
Overall Value ★★★

p209 ➢

Texas Instruments Extensa 570 CDT



The Extensa range, from Texas Instruments, is intended to be the bargain range for all those poor punters who can't afford a TravelMate. This particular model is at the top of the Extensa range, but even so, at over £3,000 just how much of a bargain this Extensa actually represents remains to be seen.

Like all cheaper notebooks, this one has a modular design. The CD-ROM drive and floppy are interchangeable although you will have to give them quite a tug, turn the notebook upside down and shake it around to dislodge them. The NiMH battery and hard disk are equally tight fitting.

The screen is a 10.4in TFT. This is as large as the range allows, unless you compromise on quality and choose an 11.3in dual-scan screen instead. Nevertheless, the quality of the screen was quite acceptable.

Although its Doom score was below average, the office application benchmark and Corel test results were, eventually, very good: we had to play around with the power settings to get anything decent. When the notebook arrived, the power settings had been on a custom setup and the Corel graphic took 55 seconds to draw using these settings. When set to "best performance", however, that time shrank to only 21 seconds. We were rather dismayed that the default setting could have been so slow.

Having got the Extensa to run properly it outperformed the opposition in its price range (i.e. the Compaq and the Digital) but did not share their impressive designs.

PCW Summary

TI Extensa 570 CDT
Software Bundle Windows 95.
Warranty One year. Optional extra three years.
Technical Support Lifetime telephone support (freephone).
Price £3,174 (plus VAT)
Contact 01784 212000. Fax 01784 212662
Good Points Screen. Pleasing to the eye.
Bad Points Swappable components hard to move.
Conclusion Overpriced.

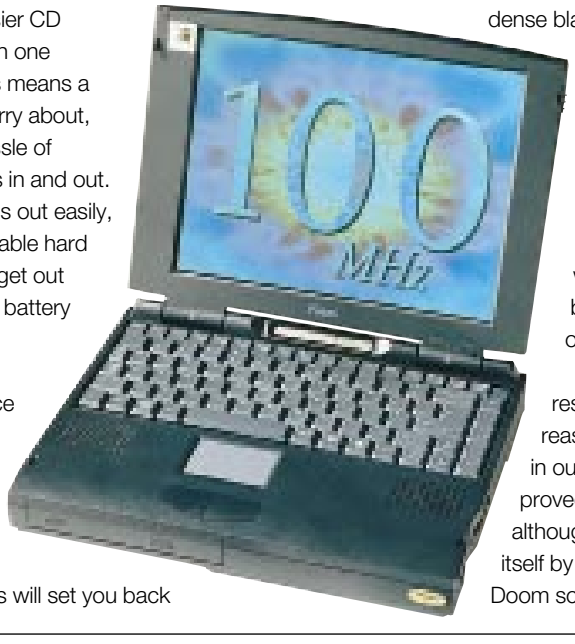
Software Bundle ★
Build Quality ★★ 1/2
Warranty ★ 1/2
Overall Value ★★

Viglen Dossier CD

Like most companies other than the huge multinationals, Viglen sources its notebooks direct from Taiwan. This particular machine is pleasing to the eye with its matt black looks and, in some respects, is ahead of the pack in the "rebadge" market.

Rather than offering swap-in components, the Dossier CD comprises everything in one machine. Although this means a little more weight to carry about, you don't have the hassle of swapping components in and out. The NiMH battery slides out easily, but the Toshiba removable hard drive is a little tricky to get out unless you remove the battery cover.

There are a few inconsequential but nice touches. You can add an extra hardware MPEG module to allow you to play full-screen video at a reasonable quality. This will set you back an extra £195 (plus VAT). Little feet enable you to tilt the notebook to a more comfortable typing position.



The keyboard itself is right at the back of the machine, jammed up against the screen. But this does at least allow room for a large wrist rest.

The screen is among the better DSTNs we saw, with a good, dense black, and bright illumination. It did not suffer from excessive bleeding and colour definition was good. There was a small amount of flicker and blotching, but neither were particularly distracting.

Performance was respectable but not outstanding. The benchmark test results were reasonably good while in our Corel test it proved quite slow, although it redeemed itself by achieving a good Doom score.

PCW Summary

Viglen Dossier CD
Software Bundle Windows 95, Works 95, Lotus Organiser 2.
Warranty One year return to base. Optional on-site (£149).
Technical Support Lifetime telephone support.
Price £2,016 (plus VAT)
Contact 0181 758 7000. Fax 0181 758 7080
Good Points Good DSTN screen.
Bad Points Heavy.
Conclusion Good all-rounder.

Software Bundle ★★★
Build Quality ★★★
Warranty ★
Overall Value ★★

p210 ➢

Ten Top Tips

Buying a notebook is no easy matter. There is no such thing as the best notebook for everyone, just notebooks which best suit your own particular requirements. However, to help you decide we have put together a few hints on what to look for and what questions need to be asked.

1. Try before you buy. Make sure the keyboard suits your typing style and that the angle of your hands and wrists is correct for you. If the typing angle feels uncomfortable, you may eventually suffer RSI.

2. Many manufacturers offer the chance to swap a glidepad for a trackball, but the position of the mouse buttons are also important, especially if you are doing graphics-intensive work or need to navigate quickly around the screen.

3. Choosing to fill the notebook with RAM has certain advantages over faster processors. It will save power as the CPU does not have to refer back to the hard disk so often and will speed up processing times. While desktop RAM prices are low, notebook RAM can be as much as three times the price. However, if you are simply going to use the notebook for a little word processing, you can live quite happily with 16Mb and a Pentium 100.

4. Many manufacturers insist that you return the notebook to them for upgrading of RAM and processors. The time lost on this exercise may cost you more than the cost of buying a better spec in the first place.

5. A large TFT screen is an expensive luxury for many, yet it is essential if you want a group of people to be able to view the screen during your presentations.

6. Battery life and weight are vital considerations. Lithium Ion batteries are longer lasting and lighter, but the importance of this feature versus cost should be weighed against the amount of time you will be using the notebook away from an external power supply.

7. An IrDA connection may be sufficient if you simply want to print or transfer files from one notebook to another. However, if you want to connect to the network and to peripherals, it may be as well to consider buying a port replicator or a docking station.

8. If you are likely to want to continually access the CD-ROM and the floppy, then having them as swappable units is annoying to say the least. But there again, having the scope for an extra battery in place of the floppy drive may be worthwhile.

9. Consider how robust the notebook is against the knocks it is likely to receive. If it is passed from one user to another and bumped around on trains and planes, it might be as well to go for a sturdier model.

10. As with all computers, consider how fast you can get your machine repaired were it to develop a fault.

Batteries

Currently, there are two main choices of battery: Nickel-Metal Hydride (NiMH) or Lithium Ion (Li-Ion). Nickel-Cadmium batteries have all but disappeared, as they were heavy and low on capacity. Neither could they exactly be called environmentally friendly, light or long lasting.

NiMH is the cheaper option but has several disadvantages. It does not have the capacity of Li-Ion: typical battery life is around one or two hours, and in order to get most out of the battery it will have to be fully discharged before you recharge it. If you fail to do this you are degrading the battery, reducing its capacity and so its useful life.

The main choice is between NiMH and Li-Ion batteries. One is cheap, the other lighter and easier to recharge

Meanwhile, Lithium Ion has a longer battery life (typically around three hours) and does not have to be fully discharged before recharging. It is also lighter to carry. Although the price differential between these two is narrowing, you can still expect to pay approximately £100 more for Lithium Ion.

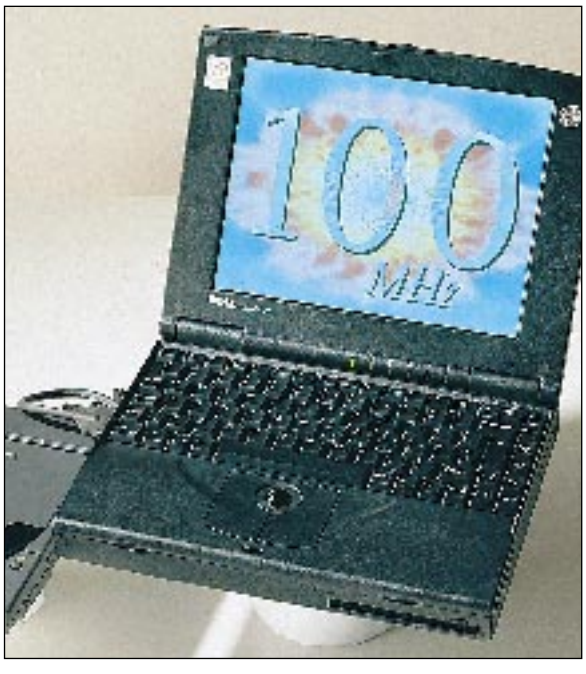
There are a couple of ways to get more out of your battery. You can turn the screen down low so you are not sending so much power through. Or, when you buy the notebook, you can actually save yourself recharging time by opting for more RAM so that, as you run applications, you are not hitting the hard disk so often.

p212 ➢

Editor's Choice

In awarding the Editor's Choice we were looking for two things: portability and speed. Portability means different things to different people, depending on how you are going to use your notebook, but battery times and weight will be an important consideration for anyone who is going to use their machine while travelling. Speed should also figure on your want list, unless you are prepared to put up with a machine that is much slower than your current desktop PC.

First prize, therefore, goes to the Dell Latitude. These machines have an excellent record on reliability, while Dell's service is much appreciated by its customers. Dell has chosen to pursue low power consumption, and has managed to squeeze a massive four and a half hours out of the machine's Intelligent Lithium Ion batteries by conserving power wherever possible. Performance has not been compromised, however, and all this comes in at a very reasonable price.



The Dell Latitude: a winner on performance and price

For pure, raw speed, the AST Ascentia P31 comes in close behind as one of the two Highly Commended products. It achieved a considerable margin over any of the other notebooks in the office application benchmark tests, and the overall spec made it a safe choice.

Finally, if money is no object, the Digital Hi-Note Ultra II must be a serious contender and so wins the remaining Highly Commended award. For looks, portability, performance and sheer posability, it is way ahead. The only stumbling block is the somewhat steep £3,427 price tag, which places it in a bracket well above the other notebooks in this test. Don't forget to buy your lottery ticket on Saturday.

How We Did The Tests

Different types of applications measure different aspects of a PC's performance so its important to use more than one benchmark to gain an accurate and rounded picture of each machine. Here, we've put each PC through three separate performance tests.

The first test assesses performance in three key areas - word processing, spread-sheets and databases. It installs a selection of popular office applications including Word, Excel, WordPerfect and FoxPro. A collection of macros are then run in each application and every process is timed and recorded. When a copy operation in a spreadsheet is about to take place, the macro containing the {COPY} instruction will first trigger the stopwatch. When the copy has completed, the time taken is written into a database file. Every test is run three times, to provide a consistency check and the three scores recorded are averaged out to produce one overall figure.

The second test run in Corel Draw records the time taken to open a series of large graphics files. This is a simple but revealing test which measures how each machine performs when using memory-intensive applications in Windows 95. The wide spread of results produced from the 16 machines included here shows the importance of this test.

Thirdly, a low level benchmark is run in DOS using the frame-rate performance test from Doom II. It tests the graphics card and hard disk, and it is noticeable from the list of results that certain combinations of components produce exceptionally high scores. The three highest results on this test came from machines with both a Quantum Fireball hard disk and a Diamond Stealth 64 graphics card.

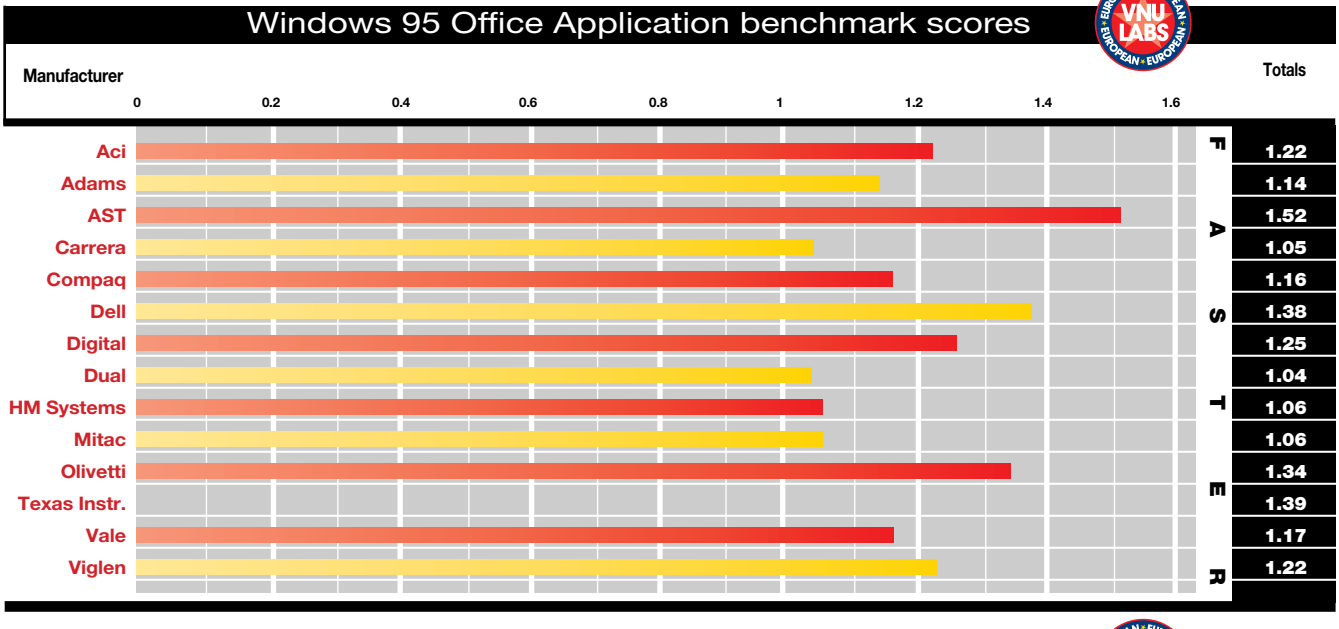
The final test runs the program pccheck.exe which is an analysis tool rather than a performance test. This interrogates the system and verifies the existence of all claimed components giving the exact speed of the processor and size of the cache. Any deficiencies reported by this program help the tester to explain freak results produced by any machine.

A separate monitor test, DisplayMate for Windows, tests each monitor for distortion, sharpness and horizontal resolution of images, colours and grey scale clarity, and consistency of colour across the screen.

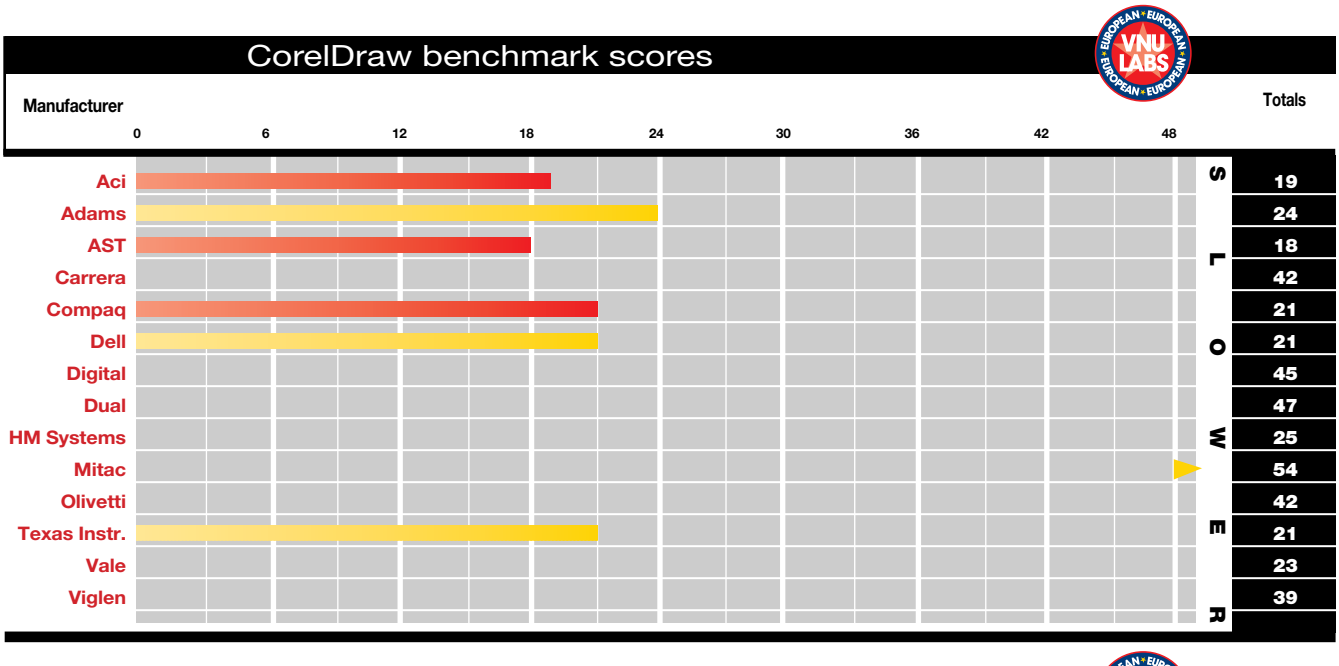
Eleanor Turton-Hill

p215 ➢

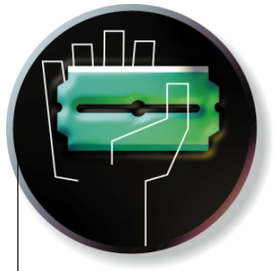
Windows 95 Office Application benchmark scores



CorelDraw benchmark scores



Doom2 Frame Rate scores



Read all about it

Are publishers taking sufficient advantage of the opportunities available on the web? Barry De La Rosa examines the current state of electronic publishing.

If anyone can be accused of promoting the web to the extent that it becomes hype, it must be the publishers of glossy computer magazines. Heralding the web as the "new media", ushering in an age of paperless publishing and global interaction, computer magazines often border on the fanatical when it comes to the latest new development in the virtual world, although their more sober editorial readily admits that there are still hurdles to be overcome before The Great Day when everyone is connected and the medium becomes as established as TV or print.

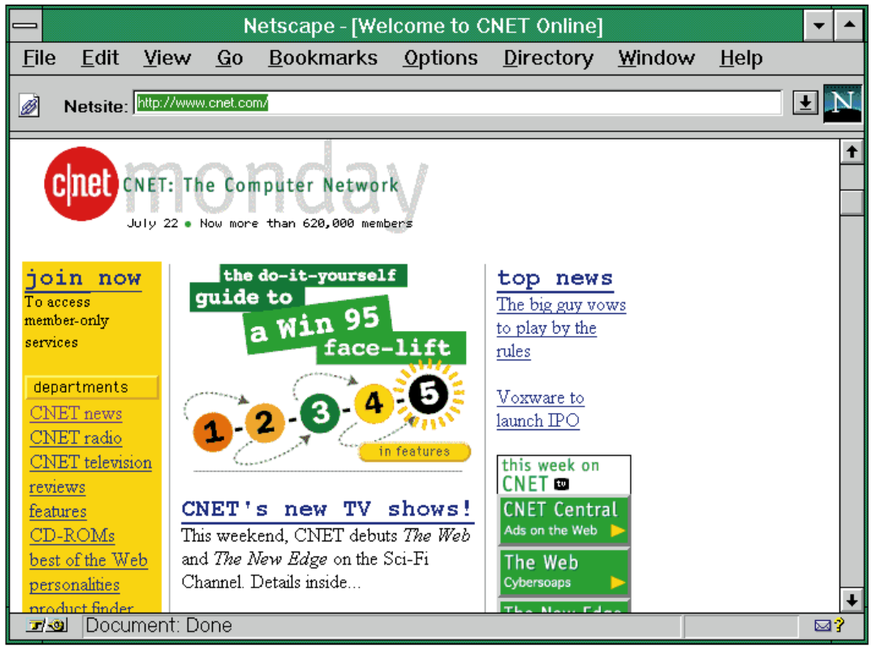
But do computer magazines put their money where their mouths are and embrace the new medium for their own purposes? More to the point, are traditional publishers, in non-computing markets, heeding these warnings and migrating to the net?

During the past year, there has been a rush to put up web versions of established magazines. There are marked differences in the implementation of this move from print to screen. At one end of the scale there is the trimmed version in which the website contains as little as 20 percent of the magazine's editorial, almost as a teaser for the "real thing".

At the other end, you find the purpose-built website that may be independent of a printed version (such as Wired and its electric brother, Hotwired), offering services and features impossible to implement in print, and editorial written exclusively for the web. These make use of the interactive nature of a web page as well as employing state-of-the-art Java and Shockwave to liven things up a bit.

So why aren't all publishers' web pages in the latter category? Most surprisingly, some of the most miserly contributions seem to be from the very people who are promoting the virtues of the web — the established computing titles. Conversely, the most exciting and informative web magazines using the web to its full potential tend to be independently produced.

So, when you next read that the web is the hottest place to be because it is cheap to get on to, ask yourself why publishers aren't making more effort to transfer their publications to the web? The potential for advertising is huge, and it offers a host of new features that print can't offer.



C-Net's successful computer site. An independent with Cable TV experience

Hard facts

The answer, in a word, is "money". There are a number of financial facts that deter publishers. Firstly, there is a lack of real market research on web users, especially within the UK, and certainly not enough to convince advertisers. Computing-related pages have the potential to do well because their readers are computer users. It comes as no surprise, therefore, that the top four web sites in terms of advertisement revenue are all web search engines, followed by C-net (all computer news) and Netscape's homepage.

For non-computing publishers, the situation is more difficult because they have to convince advertisers that those accessing their site are not just casual surfers but people whose interests coincide with a particular market segment. Software and hardware vendors and telecommunications companies represent up to 75 percent of all advertisers on the web because their market coincides with users of computers, but it is difficult to convince other advertisers that their advertisements will be well-focused. Simon Forster, Client Services Director at advertising agency, Ginn Jeffery International, comments: "Advertising on the web is only viable in a few small cases. The content is just not sufficiently compelling, apart from that on sites which provide a service, such as search engines and the more aggressive newspapers."

The problem lies not in finding out how many hits a site is taking per day, but who those hits represent. The hit figures are further confused by the fact that not all hits represent a user viewing a page. A large proportion of hits can be explained by web robots (autonomous programs that traverse the web collecting information) and other non-human accesses. The figures can also be lower than the actual number of users due to the use of cacheing by a number of service providers: a system whereby all users access the web through a proxy server that saves the most frequently accessed pages; if a user requests a page that already exists on the proxy, no new access is made to the page.

So how does a site find out about its readers? A common method used by web magazines is to ask the user to fill out a simple form before they can access the site. This registration is free to the user but provides valuable information to the publisher about its readership that can then be used to convince advertisers that a certain market is accessing the site. Although this seems to be foolproof, there is the possibility that a user will register, look at the site once, and then never return. This can lead to a false picture of the readership. Registration may deter the casual surfer even though it is free, due to the lingering paranoia about security on the internet. For an unknown publisher, the cost of publicising a page could be wasted if the potential reader does not trust the publisher sufficiently to provide them with personal information.

Publicity for a site is another restraining factor. An established title may do well on the web simply because people recognise its name, whereas a new site, however good its content, will have to work twice as hard to become well known. A well-known brand will not only attract more readers directly, but is also more likely to win the site more reciprocal links from other popular sites, thereby creating a snowball effect. If a site is good enough to make one of the major "Cool Sites" pages, it can receive a huge number of hits in the first few days; but if its brand image is not strong enough, these hits can soon trail off. So, established publishers are far more likely to transfer their existing titles directly to the web to take advantage of their brand identity.

These sites will never be a full representation of the printed version, however, because this would undermine sales unless users were charged to view the site and download it to their hard disk. But it is hard to justify charging people for access to a magazine web page when they are already being charged for access to the net itself. Additionally, it is harder to sell something that cannot be previewed beforehand. In the traditional print scenario, a buyer can peruse the magazine on the newsagent's shelf before buying. If he sees something of interest he wants to refer to later, he must buy the magazine. On the net, something of interest can be saved to the local disk, so a teaser site would have to be very sparing with its information.

Planet Science, aka the online New Scientist

Recipe for success

The internet market is still not large enough to justify a permanent move to the web. How about a site that doesn't compromise the revenue from the printed copy, yet complements it by using the interactive capabilities of the medium? This seems to be the recipe for success in a number of cases. IPC's two web titles, Planet Science and NME.com, offer a taster of their printed cousins but add a functionality that can only

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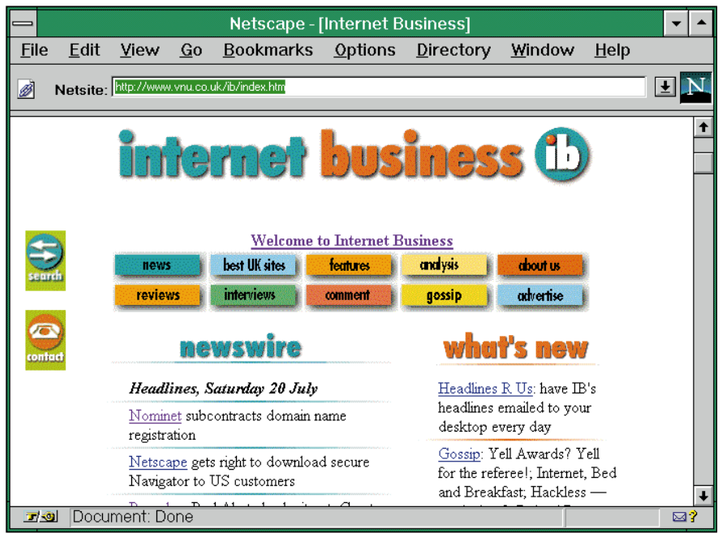
be offered by the web.

Planet Science, the online version of New Scientist, benefits from its associations with technology in that its readers tend to be involved in fields that make use of computers and the internet for research purposes. It carries 80-90 percent of the stories appearing in New Scientist, edited for a web audience, in addition to editorial content exclusive to the web. Its main feature is a searchable employment database that includes all the vacancies advertised in the publication.

NME.com carries only 20 percent of the paper version's editorial but can offer "live" chats with artistes, and may even offer live music in the future. Users can listen to snippets of songs as they are released, and vote to create an instant chart.

The next hurdle is technology. Computer magazines have the upper hand here as their staff are not only more likely to be conversant with the latest tools and methods for implementing a website, but will already know the basics of design and layout from their work on the magazine. Other publications, however, may need to outsource this aspect of the page or recruit new, specialised staff to handle the HTML coding, database management or Java and CGI programming. This presents a similar upheaval to that of the DTP revolution of the eighties when new tools and methods became available to publishers. To take advantage of these, they had to get onto the learning curve and adapt before they got left behind. By outsourcing the construction of a site, publishers risk losing the potential to be able to operate effectively in the new medium. Personal

IPC's NME.com: 20 percent of the printed magazine



VNU's Internet Business offers a new title and a new approach

Computer World's publisher, VNU Business Publications, has gone the whole hog by acquiring a web-hosting services company and the hardware it needs to support its web presence.

A new generation

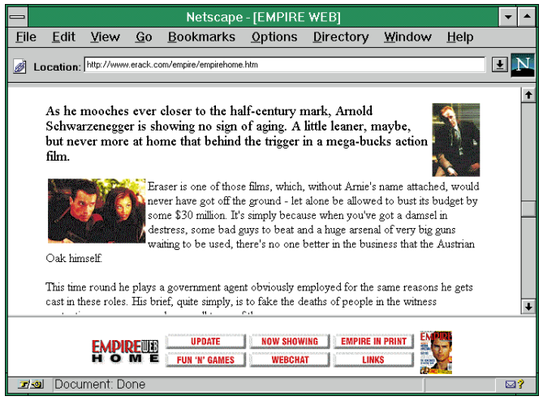
So much for the difficulties facing publishers when setting up a site, but what about the benefits they risk losing if they don't? Apart from the obvious advantages of the web, such as multimedia capabilities, a global audience and an interactive interface, the main advantage of direct relevance to any information provider is the immediacy of the medium. Not only would a complete website undermine the necessity for a printed copy, it could instantly outdate it. Halsey Minor, CEO of C-net, has cited this as C-net's major competitive advantage over other established magazines which have moved onto the net: a web page can be updated within a matter of minutes, as the news breaks. He predicts the downfall of print due to a migration of journalists to the web particularly because of this ability to break news stories as they happen.

This raises an important question: if publishers hang onto print, do they risk being superseded by a new generation of independent web publishers who, with fewer overheads, fresher news and more exciting presentation, can make their sites profitable? At the moment, setting up a new web publication without the luxury of a well-known name or the backing of an established publisher (or a lot of money), seems like folly.

"Slate", Microsoft's new web magazine, is designed and backed by Microsoft and its content is written exclusively for the net. It has serious marketing support and will soon become a regular stop-off point for many. But when the market matures, the audience may be less likely to rely on the ring of a familiar name and may judge a site by its ability to fully exploit the medium, which Slate refuses to do by relying purely on text. Similarly, the Empire site produced by EMAP Metro is a familiar name and a familiar site, as it follows the classic structure of a printed magazine, with little interactive content. It does, however, make good use of the immediacy of the web by updating its pages on a daily basis. There is still the chance that an independent site could outshine Empire with a more innovative page design and implementation.

Dennis Publishing, whose titles include

Microsoft's new venture: starting with a clean Slate…?



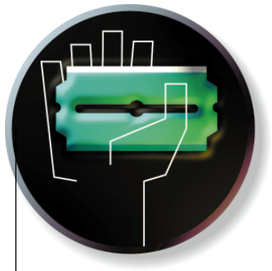
EMAP's Empire site: modelled on traditional magazines

MacUser and men's magazine Maxim, is in the process of setting up its new internet unit with IT titles expected online by November. Guy Sneesby will be heading up the new division. "It's not going to be just another case of 'here's a subset of the magazine'. If we're going to do it at all, we're going to do it properly," he says. Right now they've got financial backing thanks to owner, Felix Dennis' deep pockets, and a definite idea of what they don't want to do. Yet, the plans that do exist for some chat areas, consumer advice, software downloads and "a sense of community" don't sound stunningly different.

Established publishers are finding it hard to justify the expense of a full-blown website to the accountants and advertisers who govern the financial stability of their businesses. But in the meantime, most of them are not taking advantage of the opportunities they have to exploit their brand names, and are not working hard enough to create web pages that complement and enhance their printed magazines. When the market eventually matures and the net is as widely used by the public as TV and print, offering a full web service to replace traditional print may become viable. Meanwhile, independent publishers may find that by learning how to fully exploit the web and establish a name for themselves, they might undermine the brand names and lay the foundations of future success.

PCW Contacts

C-net www.cnet.com/
Empire magazine www.erack.com/empire
HotWired www.hotwired.com/
Internet Business www.vnu.co.uk/ib/index.htm
NME.com www.nme.com/
Planet Science www.newscientist.com/
Slate www.slate.com/
Spiv magazine www.spiv.com/
Yahoo's listing of magazines on the web www.yahoo.com/Entertainment/Magazines/



Grooving with The Black Dog

Ken Downie, aka The Black Dog, one-time hacker and now acclaimed record producer, relies on PC technology to create his pioneering music. Joe Young collars an interview.

The so-called "Black Dog Towers" is a spacious, well-lit, converted vicarage in a newly-gentrified part of East London. It is the home of Ken Downie, aka "The Black Dog", exponent and purveyor of ethereal techno-punk music. Rather than banks of synths, mixing desks and a tangle of leads, there's a raft of hardcore PC gear.

"All my boxes are custom-built from bits and pieces acquired during nearly a decade of tinkering," says Ken. Looking around, there's a P166 with a 2Gb EIDE drive running Windows 95, "for audio work and computational rendering." Three more 486s, a couple of Amigas and a DEC 486/25 notebook complete the picture. Everything is networked using IPX and IP, and everything goes "down the same cable, without any serious problems."

A big Linux fan, Ken has another old 486DX/66 running Slackware v3. "Sounds quite cool, doesn't it?" I ventured… "Quite cool?! It's O#@*&Q! marvellous," he enthuses. "SCO Unix costs at least £4,000 and Slackware is twenty quid for X Windows and a complete development system, which I use for whatever I can. Linux might even lead to the demise of Microsoft. Freeware is the future."

Ken cites a Windows emulator called WINE, which runs MSDOS programs under X, as an example of how to subvert Microsoft's world domination. "The writers assure us that eventually you will be able to dispense with your Microsoft windowing environment and run your application software without needing them at all."

Going underground

Does he keep up with the wider Linux community? He laughs, "Only when I need help… an answer is never usually long in coming. There's someone out there somewhere who can help you out. I read a few Linux newsgroups, but I'm hardly a 'face' on the scene."

Maybe not, but Downie has an impeccable CV as a member of the electronic underground. Ex-hacker, "discordian pope", creator of some of the most cutting-edge music you're ever likely to hear, he even has his own philosophy up on the web, known as The Book of Dogma.

He's come a long way. "I started out on an Amiga 2000, and a £30 sampler. I was doing demos and slideshows. This was about 1986. I've still got the sampler and it's still pretty advanced. It has a full waveform editor and all that, low bandwidth of about 10kHz, so you get lots of whine but it works. A lot of people are producing drum and bass on it now. You can still press from it. In a way it sounds better, because it's not so crisp and defined — I like to mix'n'match."

He started by just "messing around". Then he "knocked up the 'Virtual EP' and pressed up 1,000. I did the demos on my own and then put an ad in the music press for some helpers." With two other like-minded experimenters, a three-piece band known as Plaid was formed. "None of us could play a 'real' instrument," he admits.

It's a text-book story, the stuff of which today's pop stars are made. Three blokes with a few synthesisers, an Amiga and a sampler. But the nineties' musical establishment of self-styled techno-gods is not one The Black Dog wishes to inhabit. "The acid went out of house a long time ago. It was too scary, too non-commercial. By the time people started seeking out acid house and the whole M25 orbital rave thing, it had already died a death."

Cool in command

So how does he compose these ethereal musical structures? "Well, I like to use my computers for things other than composing. Which is where my PCs come in. They can run cool OSs without any aggravation. I'd hate to be stuck in the one environment all the time. I need a command line. I guess you can get the same music software on most platforms now, but I prefer to stick with my PCs than pay out for something more expensive that I don't really need. I used Cubase Audio on one of my 486s to compile the album from the master DATs. This gave me another chance to equalise all the tracks into a listenable whole."

It's easy to see where Ken Downie's reputation as the producer's producer originates. He's highly acclaimed by Bjork and 808 State's Graham Massey, among others. "Music For Adverts and Short Films", released in July, is a corrective to the blandness of much so-called techno. From "Dumb and Dumber" (Mission Impossible on Mogadon) to the tribal drums and melancholy strings of "Tzaddi", it's constantly experimental, atmospheric and intriguingly low-fi. When Downie lurches into obscure un-music, as he inevitably does, one is inclined to forgive him.

If there's a recurring agenda in Ken's career, it's the urge to use technology to challenge and expose. But the internet's appeal to him as a hacker is fading fast. "I've spent a lot of time hacking on the net, just seeing how insecure different places are. The web's just not worth bothering with, it's too easy. You can buy CDs full of binary nowadays, so there's no need to steal code any more."

There are two varieties of hacking and he liked both. "I taught myself the rudiments of programming, but also read all the textfiles on the subject that I could find. These were written by human beings somewhere so I guess they taught me the basics and I went on from there. Then you meet up with people, have crazy conversations, and learn a bit more. And so it goes on, until you can build and do what you want without referring to manuals."

"The other variety of hacking was something in which I was interested: I was in and out of places that I shouldn't have been but so were a great many other people. It was about being a community, and having fun, not about being malicious. I got into hacking while I was in the navy. I worked as a radio operator, so I was hacking the navy networks and satellites.

"I had access to quite a few networks. I could just phone up operators in Bermuda and they'd put me through — you shouldn't have to pay for communications. I don't do a great deal of it now, as firstly, it's too easy to get busted, and secondly, I have other things to do."

He says the phone network is digital these days, so phreaking, in the old sense, is strictly for the history books. But surely people still try? "Yes, but there seems to be only a few people capable of using the global trunks and they aren't telling anybody anything. I don't blame them, but they aren't like they used to be. One for the fireside when I'm old, I guess. But hacking was never malicious in the sense of wanting to trash things. It was just done to see what's there. For the fun of exploring. For sharing code."

The Black Dog: "I started out on an Amiga 2000 and a £30 sampler"

Motivation

Warez, the copyright software, was evaluated, binned if it was useless, or passed on to others if it was useful. It's all long since been deleted. "There was a street vibe then, and it was a very exciting time to be involved in computer comms. But things have moved on since then, and so should we. Music motivates me more than phreaking now."

For hacker king Kevin Mitnick, Ken's got some good advice: "He should have eaten less pizza, then maybe he could have run away!"

Today, he is realistic and cool about programming, too. "I dabble, and would rather just type 'MAKE' if I could. I like object-orientated programming, because in a world of infinite possibilities, it's the only one that sort of makes sense. Java is nice, but it would be nice to have the bandwidth there to support it. It takes long enough to load a small .GIF image, let alone an animation."

Free communications are important to Ken Downie. Despite changing times, he seems adamant that there's enough of the hacker ethic remaining in the internet community to provide underground resistance to "those who want to rule the world by licensing." And then there's the organic computer. "Universal access to quantum mechanics and nanotechnology will mean there's no first, second or third worlds. We'll all just be human. I'd like to think when the organic computer comes, we'll be mature enough to share it among ourselves."

The future of The Black Dog is now devoted to broadening the horizons of "Black Dog Towers", both electronically and spiritually. "I'm designing a skateboard-simulation game, a few more remixes, and I want to keep building up the Book of Dogma. We'll be fleshing the game out on the PCs here, but turning the project over to a coding team. I realised that it could take me my whole life to write it, and that the best strategy was to get programmers (because they program best) to do it instead. I'll hopefully be part of the design process, and help artistically… as well as getting the teas in," he adds.

PCW Contacts

Music For Adverts and Short Films is released on Warp records.

The **Book Of Dogma** is on **www.hyperreal.com/tbd/**

net.news

Around the web world with PJ Fisher.

Checkpoint opens in the UK as firewalls take hold

■ Firewall installations worldwide are set to soar to 1.5m by the year 2000. This compares with barely 25,000 shipments in 1996, according to new figures from the International Data Corporation. The figures mostly reflect the continued rise of internet use and security fears related to it. The emergence of intranets has led to companies building firewalls within organisations to protect departments. IDC expects a drop in price for installations from around $16,000 today to around $650 by 2000.

One company set to do well out of this is Israeli-based Checkpoint Software, seeking to boost its UK market share with the opening of a UK office and a new version of its FireWall-1 software. "The UK market is one of the fastest adopters of new networking and internet technologies," said Marius Nacht *(pictured, left)*, VP of international operations.

Version 2.1 boasts a Win95 controlling interface that can run on PCs separately from the firewall software that runs on UNIX or NT workstations. Remote access software will enable authorised users to log in to their office systems behind the firewall.

Security is a problem affecting not just corporate but military and educational establishments. "Once people stole secrets through espionage and guns; today people can do it electronically," said Nacht. When Checkpoint first developed Firewall, they themselves were subject to an attack from students who piggybacked onto Checkpoint's partners' networks to try and break into Checkpoint's own systems.

"Some users are becoming so paranoid about security that they are installing firewalls on their desktop UNIX machines simply to stop their colleagues accessing their machines," said Nacht.

■ Checkpoint recently signed a deal with the Quza organisation, enabling Quza to resell Checkpoint software to its customers.

Checkpoint 01223 421338; www.checkpoint.com

Yamaha and Netscape make sweet music together

■ Yamaha and Netscape have teamed up to produce a Navigator plug-in that promises real-time music on the web without waiting for files to download. Users without sound cards can also enjoy the new plug-in, according to Yamaha.

The SoftSynth plug-in uses MIDI which is more compact than standard audio wave data. Yamaha says this allows entire musical compositions to be embedded on a single home page. Soft Synth can be downloaded from the Yamaha web site.

www.yamaha.co.jp\english/xg

Integralis offers email security

■ Integralis has announced MIMEsweeper version 2.3, which claims to offer traditional anti-virus properties and greater protection to email users from unauthorised access. It will also control the amount of junk email and chain-mail you receive. Integralis says it considers content management to be just as crucial to network security as stopping viruses.

Users will be able to archive email and add legal disclaimer notices automatically. Support for binhex, Base 64 and Novel GroupWise internal mail systems will be included in the new version.

Integralis 01734 306060; www.integralis.co.uk

Microsoft enters the game zone

■ Microsoft has acquired Electric Gravity Inc, the creator of the Internet Gaming Zone web-site. The site contains a number of games such as bridge, chess, spades and Reversi. Despite the low-tech nature of the games, Microsoft claims that this is one of the most popular sites on the web. "We will be one of the big players in this emerging market," said Microsoft, which is expected to use the site to promote its ActiveX-enhanced games, currently under development.

www.zone.com

GSM phone users get the InterMessage

InterMessage lets you send messages from a GSM phone to an internet-connected PC

■ Motorola Telco has launched a new email service for GSM phone users. Called InterMessage, it will enable users to send text messages to GSM phones from any internet-connected PC. Text messages are limited to 160 characters, based on the Short Message Service (SMS).

Motorola Telco is one of the biggest cellular airtime providers. It leases airtime to both the Cellnet and Vodafone networks whose customers are billed by Motorola Telco.

The email addresses suffer somewhat from this amalgam of PC and cellular technology. For example, if the user's number is 0385 300316 then the email address is 44385300316@sms.telco.mot.com.

Motorola stresses the benefits of the new service, however. Alphanumeric messages can be delivered internationally and incoming messages can be stored on a SIM card. If the phone is switched off, messages are stored on the GSM network for up to 72 hours.

The service will cost £2 (plus VAT) per month for Motorola Telco customers. This allows for 15 messages per month. Subsequent messages are charged at 20p per message.

Although the message senders are not billed as normal, Tim Robinson of Motorola said that in effect users were being billed for the convenience of receiving email messages and that the charge was reasonable.

Motorola Telco 01256 790278

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Online publishing brings late rewards

■ Forrester Research has come up with some bad news for online publishers. According to new research, typical content sites will lose around $3.9m beyond initial investment before they even start to make a profit.

Only after 2000, when Forrester calculates that 20 percent of the US adult population are online, will revenues start to exceed costs. No estimates are available for Europe.

The main cost for any media-based (and any other) website is staffing. Forrester modelled its figures on a typical website that would cost around $1.5m to set up and employ 15 people. The figures are scalable and, according to Forrester's Bill Bass, would translate across the Atlantic.

For example, Time Warner spends $10m dollars a year running its services on the web but only makes $2m from it and employs 150 people. "Major media brands cannot afford to not be on the web — they have a long term interest in being there," said Bass.

"It's like the cable TV experience. Disney decided not to offer a free cable channel, which left the way open for the (then new) Nickelodeon channel to steal subscribers by offering its service for free. It established itself as a brand and now rivals Disney in the US as a premier content-provider for children," he said.

New brands can establish themselves on the web, such as c/net orgnisation, but you still need money and not all backers are prepared for the long haul. O'Reilly & Associates pulled the plug on its Web Review site, unwilling to withstand the heavy losses.

Those hoping to make money from subscriptions should be wary, according to Forrester. These will only cover 40 percent of costs and even the most devoted are unlikely to pay substantially more for a web magazine compared to its print equivalent. Slate, take note.

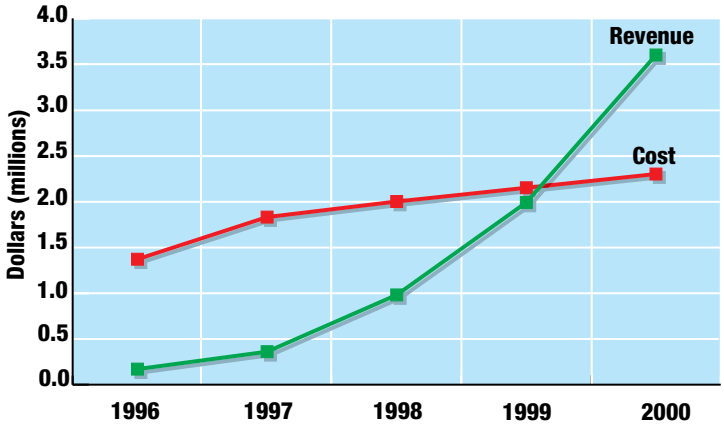
"Most of the money will still have to come from advertisers," said Forrester. However, despite its primitive state, web users accept that the web is not TV and web advertising can be just as effective. "People are convinced that the web will revolutionise the way people get information," said Bass.

The losses that are likely to be incurred could mean that web content-providers will be dominated by the global media groups and companies like Microsoft; those who are able to absorb year-on losses until the market provides them with a return.

It could be worth the wait. Those that abandon the web may leave the door open to start-ups and new brands when the market conditions are favourable to online content. "Dropping out will ensure that someone else gets there first. Staying in the game is the only way to win," said Bass.

■ See Cutting Edge Focus, page 216.
www.forrester.com

Costs against profit for websites



Revenue	1996	1997	1998	1999	2000
Advertising	0.10	0.25	0.82	1.78	3.33
Subscription	0.06	0.09	0.13	0.17	0.21
Transaction	0.01	0.02	0.03	0.04	0.06
Total	$0.17	$0.36	$0.98	$1.99	$3.60
Profit/loss	-$1.20	-$1.47	-$1.03	-$0.16	+$1.30

Intel phones homepage

■ Intel has launched Internet Phone for Windows 95. Web-based telephony used to be for companies happy to struggle with bandwidth and quality limitations. Internet Phone employs the H.323 data standard, designed to become a global protocol for devices connected across the internet for voice and data transfer. Microsoft and other vendors already support the standard.

It works as an applet which snaps into the bottom edge of the user's web browser and uses a point-and-click interface.

Internet Phone supports Microsoft's User Locations Service (ULS). Intel says Internet Phone lets users browse and chat simultaneously. A beta is available for free download.
www.intel.com/iaweb/cpc/

Adobe gets cool

■ Eager to promote its new Acrobat 3.0 software which allows web users to view PDF files within their browser, Adobe has sponsored the Project Cool website. This is an online guide to designing websites which make the most of Acrobat 3.0. The new format will work with any browser that supports Netscape API architecture.

The Project Cool Acrobat Developer's Zone is a guide to creating web sites using PDF files as content. Adobe says it chose Project Cool because "it had been a pioneer in evangelising and defining the standard for good website design." On the site, designers will be able to check out online tutorials and sample PDF files.

Acrobat 3.0 is expected to be released at the end of September. Meanwhile, Adobe has slashed the price of SiteMill to around £130 from its initial price of £400, reflecting the competitive nature of the web market.
Www.projectcool.com/developer/acrobat

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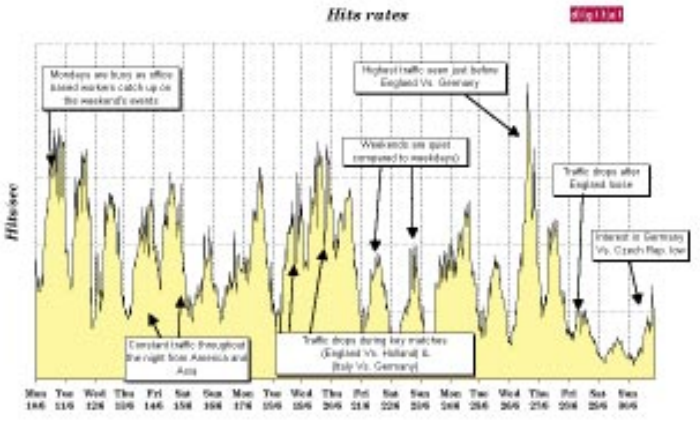
Euro96 website takes the strain

■ It wasn't just England's pulse rate that rose during the Euro 96 championship. The Digital servers which were holding the official Euro 96 website also underwent some stress, as this chart clearly shows. Lucky really that Southgate missed – who knows what might have happened if England had got through to the final.

Copyright Digital Equipment Corporation



PaperPort gets the fax

■ Users of Visioneer's PaperPort multi-purpose document scanner will soon be able to send faxes directly from the PaperPort across the internet to any standard fax machine worldwide.

Based on software developed by NetCentric, which allows users to send faxes from PCs to the internet, the PaperPort Link will be bundled with new Visioneer products. Existing owners can download the link from the Visioneer website.

Visioneer says that faxing via the internet saves money as it doesn't tie up the phone even if the recipient's fax machine is engaged or out of paper.

Visioneer also signed an agreement with Netscape to bundle a copy of Navigator with the PaperPort, and a viewer plug-in which will enable users to view paper-based documents within the browser using standard email protocols. The PaperPort file format will display enclosed documents in line with the text of a mail message.

www.netcentric.com
www.visioneer.com

Yahoo, it's my Yahoo!

■ Forecasting a move into online publishing, Yahoo has launched a personalised news service called My Yahoo. The free service will provide customised news, weather and sports scores to any web user. An extra tool , My Agent, will enable users to communicate with other Yahoo users with similar interests. Yahoo, now part of the Softbank organisation which owns Ziff-Davis, is also trialing interactive versions of ZD publications including the US magazine, *Internet Life*. The move comes as dedicated search sites look to add value to their existing services. www.yahoo.com

Internet café goes on the game

■ Despite mixed fortunes for Internet cafés — CyberSpy in London recently closed down, others are still moving in where others fear to tread — the latest mover into the market has a twist: gaming. Shoot 'n' Surf has opened in New Oxford Street, London.

The new café is sponsored by Carrera Technology which has provided 20 Carrera PCs and networking hardware. "Shoot 'n' Surf adds a new dimension to internet cafés, proving the games industry has come of age," said Carrera.

Shoot 'n' Surf 0171 830 0486

Net surf

The Armchair Scientist

■ This Italian-sourced site, subtitled Lo Scienziato in Poltrona, is a real find. It's a treasure trove of scientific information and research which ranges from The Private World of Granular Materials to Software Chaos.

The web is jam-packed with the paranormal and X-Files nonsense, so it makes a nice change to stumble upon some real science for a change. There is also an index of old issues and of course links to other science sites, including New Scientist's superb Planet Science.

AOL falls foul of the Germans

■ For the second time, a major online service has fallen foul of German authorities. AOL is under investigation by the Hamburg Prosecutor's Office for allegedly distributing child pornography. AOL is jointly owned by America Online and German media giant, Bertelsmann.

Like CompuServe before it, AOL is co-operating with the investigation, but claimed that it cannot control messages sent through AOL. CompuServe was investigated last year by Munich authorities for allegedly distributing both neo-nazi material and pornography.

Let's go to the movies

■ MovieWeb is a new site that aims to provide the most up-to-date listings and movie news for film fans. Also on the site are film previews, soundtracks and access to local film listings. MovieWeb is on www.movieweb.co.uk and is based on a similar site in the United States.

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AgentWare sniffs out web information

A Cambridge-based start-up has released a beta version of what promises to be a groundbreaking internet tool. AgentWare, from Autonomy Corporation, uses neural network technology to seek information from the web. It uses intelligent agents that are claimed to "learn" as they find information and be able to discard irrelevant information.

The developer, Mike Lynch, explained that, unlike previous internet search tools, AgentWare is designed to think like people rather than computers. So instead of typing in a list of keywords, AgentWare encourages you to type in associated sentences in plain English before sending the agents off into the internet. The agents read entire websites and place them in order of relevance, and continue to search until the user cancels the search.

In the beta, the agents take the form of cartoon dogs, but the final software may look different depending on user feedback. Once agents have been trained, they can be used to gather information from websites and create personalised newspapers. Information can be gathered overnight so that a personalised newspaper is ready in the morning.

AgentWare will also work while the PC is switched off, by sending the agents to a "Kennel" which can reside on a server. Other agents that the company is working on, and will release in a "Pro" version of the software, include a Press Agent which will deliver the personalised newspapers. A Mail Agent will sift and organise email in order of importance and automatically sift out junk email.

Later, a Guardian Agent will allow sites to be vetted not just on key words but the whole site, which should allow innocent sites through while preventing access to hard-core pornography and other adult sites.

A 30-day time-limited beta is currently available on the web site and the final version will be available in October for £49.99. The Pro version will be available at the end of 1996 for around £79.99. www.agentware.com

Surprise loss for CompuServe

Flat subscriber growth and hardware investments are the reasons given by CompuServe to account for its surprise loss in earnings in the first quarter of this year.

CompuServe is said to be enhancing its software for CIS that will improve surfing speeds for subscribers, both on the internet and CompuServe's own service.

Call collect

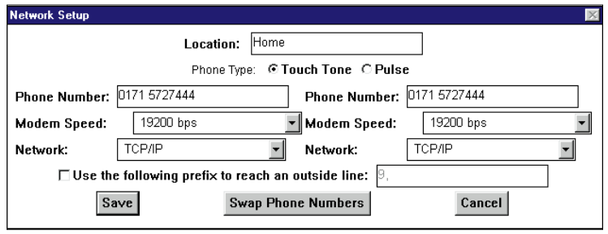
Is the internet in danger of running out of addresses? What is the best way of updating websites? These, and other questions, are answered by Nigel Whitfield.

Two calls with one phone

Q. *"I have an account with both AOL and an internet provider. Can I collect my AOL mail via the internet using Eudora?"*

A. No, you can't. AOL is a closed service and you can't access your mailbox using a standard email program like Eudora. It's possible to connect to AOL over the net, so that you won't have to make two phone calls to collect all your messages.

To set this up, start the AOL program and press Setup on the sign-on screen. You'll see a list of locations and some buttons. Click on Create Location and type



By setting the Network to "TCP/IP" you can connect to your AOL account via the internet

in a new name like "Home via internet".

When the location screen appears, don't worry about the phone numbers. Just below them is a setting called "Network". Make sure this is set to TCP/IP on both sides of the window and then press Save.

Choose your new location and then return to the sign-on screen. When you tell AOL to connect, it will say "Initialising TCP/IP" and connect via your internet provider. Depending on the internet software you're using, you might have to dial up manually beforehand. You'll need to make sure that your internet connection is configured correctly with a name server, otherwise AOL won't be able to find the computer to which it has to connect.

Keeping your name

Q. *"We have had an email account with Demon for quite a while and so we have email addresses of <anyone>@pbatech.demon.co.uk. We have recently started a net site through NetLink and have paid them £99 to register our own domain name of pbatech.co.uk. This means our net site is at http://www.pbatech.co.uk.*

Can we now take our domain name anywhere? Will Netlink charge us to re-allocate our domain name, and where do Nominet and Nomination fit into all this?"

A. Now that you have registered your domain name, you can in theory move it between providers.

When a domain name is registered, it is "delegated", usually to an internet company which agrees to provide the primary nameserver for that domain. Although it's theoretically possible to have a domain delegated to one provider and have different services provided by others, it's quite complicated and the best solution is almost always to have all your services provided by one company, not least because it can be hard to work out what's wrong if there are lots of people involved.

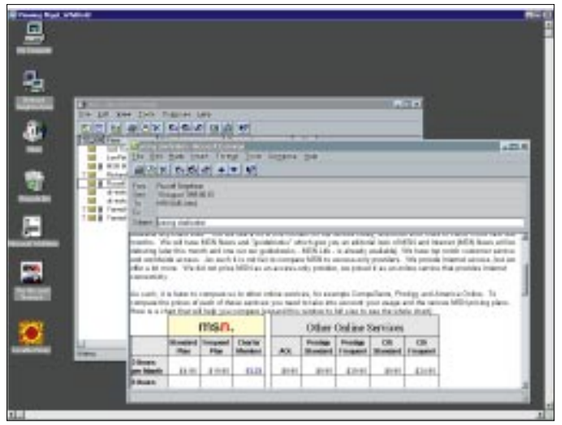
You can't have email to your domain name sent to your Demon account because Demon's computers wouldn't recognise it unless you paid its mail-forwarding charges, which include registration of a domain.

In general, when a domain is registered, it is registered on your behalf by an internet provider and you are free to move it to another provider who will liaise with your current one to ensure a smooth changeover. Usually, you will only have to pay a fee to the new provider. Only the most unscrupulous will charge you to release a domain name that they've already made you pay for once.

Nomination is irrelevant. They handle registrations for the "uk.com" pseudo-domain, which is not a proper top-level domain. Nominet is the new body set up to oversee domain names in the UK, but unless you are registering a new name, you won't need to deal with them until next summer when annual charges for existing domains will be introduced. Your new provider will do all the work to ensure that your existing domain is set up correctly.

Remote commands

Q. *"Is there an application that I can use to remotely issue commands to a Windows 95 PC over the internet? I would imagine this would be a telnet server application of some kind (on the remote PC) and a Win95 telnet client on the local PC. I have tried the various shareware libraries but can only find such a program for NT. I need it for remote debugging of an internet application I am working on."*



ReachOut remote control is one solution to consider if you want to access a Windows 95 computer over the internet

A. I've not been able to track down a telnet server but if you can afford a commercial solution, many of the latest generation of remote control packages are able to connect over TCP/IP networks including the internet. Both Norton PC Anywhere 32 and Stac's ReachOut can be used over the internet, and will allow you to see exactly what's happening on the remote computer.

Keep your pages up-to-date

Q. *"I have been developing websites for the community in and around the Sheffield area. The problem arises when I have gone and the people want to update their own website — they cannot do this without some technical assistance. I will not always be able to do this for them and it will begin to cost them money. In view of this, I want to develop a form for the various projects which could reside on their own computers, whereby fields on the form relate to areas on their website which are likely to be subject to change. All they would have to do to change selected areas of their website would be to fill out some simple forms and the rest would be done transparently."*

A. There are two main problems that you need to overcome to help people update their own website. The first is creating new pages, and the second is uploading those pages to the web server where they're kept. There are a number of solutions. The best is to invest time showing people how to use a web page editor like PageMill or HoTMetaL Pro, which can be used to create new pages easily. An FTP program that understands scripts can be set up so that a single click on an icon will transfer all the relevant files to the provider's web server.

If you use a provider with Microsoft Front-Page extensions on its server, FrontPage itself will take care of transferring the pages to the web server when they're updated.

Using forms relies on having a web server that will accept and process the results of the forms. It's certainly possible to create a form which people could use to fill in, for example, the latest news, and then transfer it to the web server. However, you'll need a script on the server to process the results of the form, and you may find that it costs extra to have this facility provided by the service provider. You'll also need to write it in a suitable language, such as Perl. The script will have to read the results of the form and combine them with a standard template to create a new web page. Although this is fairly straightforward to do if you've used Perl before, it's not a trivial project, and you may be better off asking a professional web author to help you set everything up.

Standard speed

Q. *"Not long ago, I made up my mind to buy a 33,600-speed modem. But in the last issue of PCW, I see that it isn't standard and may not connect with other modems. £160 would be affordable (I'm looking at one of the Sportsters) and it would be used for both a PC and an Amiga. But if it isn't standard, will it render the entire modem useless, or can it drop back to a standard 28,800? I would be willing to pay £160 even for a 28,800 modem, but would prefer the faster type. What would you recommend?"*

A. With high-speed modems, it's almost certainly sensible to stick to the standards. Although some internet providers are claiming to offer access at 33,600 bits per second, it's only possible with certain

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If you want to use RealAudio, make sure you're not accessing the web through a proxy server or firewall

brands of modem. Just before the current V.34 standard was ratified there were many modems on the market using a system called vFAST, and while some of them would talk to other brands, that wasn't always the case. In fact, the same was true of some of the very early V.34 modems. The new 33.6Kb modems will fall back to the V.34 standard, but the experience many users had with V.34 suggests that it might be best waiting for the real standard.

If you want to be absolutely sure that your modem will connect both now and in the future, you should stick with a V.34 model, but look for one that has a flash memory. That is software that can be upgraded by running a program on your PC or downloading a file to the modem. This will enable you to upgrade to the standard when it finally appears, and to upgrade again if there are any problems with the first version of the firmware.

Download dramas

Q. *"I have a Real Audio player on my computer, but I can't get it to work properly. When I download other types of sound file, they work fine, and I'm sure I've installed the software properly. What am I doing wrong?"*

A. It's impossible to be certain, but one of the problems that you may have with RealAudio is that it's not really a system that's designed to download files. When you use RealAudio it connects to a RealAudio server and plays the sounds as they're sent over the internet.

If you have your web browser configured to use a proxy server, it may be sending requests for RealAudio to a proxy server that doesn't understand how to deal with them. As long as you have a direct connection to the internet, turn off the proxy settings in your browser and all should be well.

Access through a firewall is a little more tricky, and you'll need to ask your network administrator to configure the route and firewall before you can use the system. This problem doesn't appear with other types of sound file, like .au and .wav files, as they're downloaded to your computer before being played. If you can't access RealAudio files on your computer, you may be able to download them by telling your browser to save the link to disk, rather than opening it.

Short on numbers

Q. *"I've heard that the internet is 'running out of numbers'. What are the numbers, and is this true? Does it mean anything to ordinary users?"*

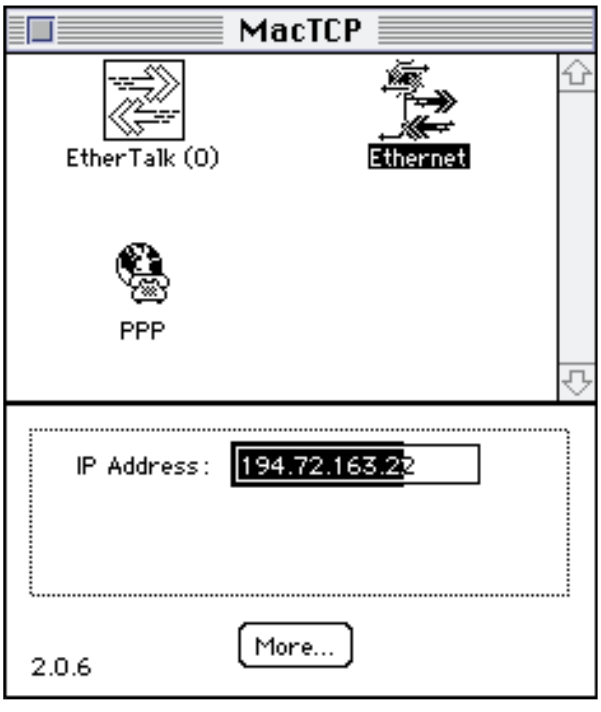
A. Every computer on the internet can be referred to in two different ways, by a name and by an number. The names are a convenience for the people who use the network, and are the things you're used to using when you look at websites or type in an email address.

The numbers are 32 bits long and are usually represented in the form 1.2.3.4, where each of the numbers can be between 0 and 255. A system on the internet called DNS translates between the numbers and the names. So, for instance, my computer, stonewall.demon.co.uk, has the number 158.152.8.48.

To make it easier to send information to different parts of the internet, all the computers in an organisation are given numbers within the same range. By using simple binary arithmetic, the routers (dedicated systems that send information in the right direction down different links) can work out which part of the internet information is destined for.

Originally, the numbers for all computers on the internet were allocated centrally, but now there's more than one organisation. For instance, RIPE allocates numbers for internet providers in Europe, and those providers pass on part of their allocation to their customers. If you move to a different internet provider, you'll almost always have to change the numeric address of your computer, even if you keep the same name. Changing the numbers helps to make the work of the routers easier.

p237 ➢



It if ain't broke, don't fix it. Unless you have a compelling need, don't worry about upgrading to Open Transport

When the internet was first set up, the numbers were allocated into different classes, called Class A, Class B and Class C addresses. A class C network had 256 addresses, a Class B 65,536 and a Class C 256 times as many as a Class B. The way the numbers were allocated, to make it easier for routers, meant that there were only 126 Class A networks, and just over 16,000 Class B networks available. As the internet grew, it became apparent that there were many organisations that needed to connect to the net and had more computers that could be fitted on a Class C network. There were few Class A and B network numbers that could be allocated, and as a result, there was concern that the internet would soon run out of numbers.

For the time being, however, there's no need to worry. By changing the way that internet addresses are allocated, using a new system call Classless Internet Domain Routing (CIDR), addresses can be allocated much more flexibly, putting off the time when a complete rethink is necessary.

That rethink has already been done, in the form of a new version of the Internet Protocol which allows for thousands more addresses; enough, according to some calculations, for virtually every lightswitch on the planet to have a unique internet address. The new version has also been designed to make it as easy as possible to migrate when the time comes, so it should be much easier for everyone to make the change. In the meantime, there's really no need to worry. While addresses are still being used up at quite a rate, with many web servers requiring an internet number for each customer, there are lots of other developments in the pipeline that will help put off the day of the great switch-over.

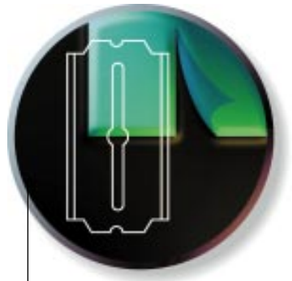
Travel on the Open road

Q. *"I'm using a Macintosh, with MacTCP. Is it worth upgrading to the latest version of the System software so that I can install Open Transport?"*

A. If you're using your computer on a local network, then it might be worth upgrading to the latest version as OpenTransport will make some things happen faster. If you're thinking of connecting to the internet with it, you should check to make sure that all of your programs are compatible. In particular, some versions of MacPPP might not be, so you'll have to download a new one before installing the upgrade. Otherwise, you won't be able to connect afterwards. For many users, especially if you have an ordinary modem connection to the internet, there may not be a sufficient reason to upgrade. If your system works, don't try to fix it!

PCW Contacts

Nigel Whitfield is a freelance writer and maintainer of several internet mailing lists. He welcomes feedback and comments at **nigel@stonewall.demon.co.uk.** If you have questions you'd like answered, please send them to **net.answers@stonewall.demon.co.uk.** A personal response cannot be guaranteed.



Books

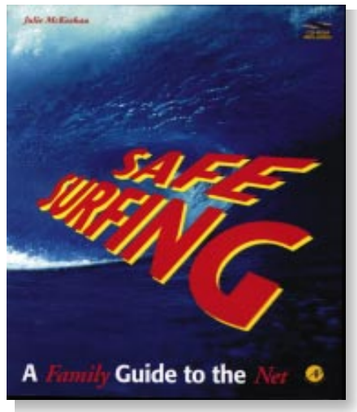
Net-heads, corporate types, safe surfers and those seeking killer websites, read this…

Safe Surfing: A Family Guide to the Net

It's safe to say that it's finally happened. The net can now be mentioned effortlessly in the same breath as the telephone or TV. With approximately 50 million users, the net is no longer the sole domain of nerds and psuedo-anarchists, but now includes your average middle-class family, kids and all. As a result of this vast net-surfing, there's been an increase in worried net-using parents, who suspect that their children could be exposed to much nastiness. *Safe Surfing*, by Julie McKeehan, is just the answer for parents who aren't sure what to do.

The book is an all-in-one guide to what the net is and how to make the most of it. McKeehan, a parent and avid surfer herself, writes at a level that everyone in the family can understand. The book covers the basic features, from what WWW means to how FTP sites operate. Issues such as choosing online service providers, their costs, and what this means to your family budget, is useful information.

Admirably, McKeehan emphasises the vast resource of information that the net can provide for your family. Things like news, weather and sports sites are good for Mum and Dad, while music, newspaper or library sites are ideal for the kids. She particularly emphasises its potential for helping the kids with their homework.



Predictably, McKeehan does go into the dark side of the net, warning parents of dangerous material. Porn, chat sites, "very bad people" and security are subjects covered, but not in the alarmist manner we've come to expect. Taken as a whole, this book is something the whole family can fight over, just like the telephone.

Dylan Armbrust

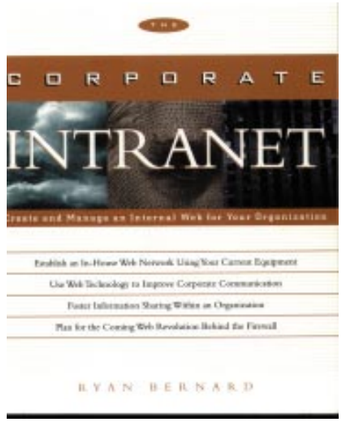
The Corporate Intranet

The intranet is coming. Just when you thought you'd got this internet business licked, along comes another technology to knock you down again.

I first heard the word "intranet" about a year ago on a visit to Silicon Graphics. Then, it seemed like just another marketing buzzword cooked up by software companies eager to resell existing ideas. But it's here to stay, and now everybody is jumping on the intranet bandwagon.

Ryan Bernard, the author of this book, has been building intranets since August 1994. Notice that I specify August. It illustrates how fast events happen on the internet when experts have to state which *month* they started using a technology.

The Corporate Intranet is a timely book and one of the first. There is a now a genuine feeling within the computer industry that HTTP technology will more likely be used by large corporates for internal networks, or "behind the firewall"



as this book puts it. Larger companies are also more likely to restrict access to the internet for some of its employees and even to individual departments. Corporations will want HTTP applications used productively. In other words, they won't want their people idly surfing when they should be working.

This is a serious book, aimed at managers and technologists seeking to change working practices in their organisations. There is an interesting chapter on real-life intranets, including Sun Microsystems' own intranet that employs over 3,000 servers. Sun uses it for training, communication and software access. It's a fine case study and puts the message across well. Internal webs are, indeed, highly suitable for distributing active information across LANs.

Once the book gets into the meat of setting up an intranet server and networking, the going gets tougher. But the no-nonsense approach shines through in the chapters on HTML and Java.

Top Ten Books

1	Java in a Nutshell: Desktop Quick Reference	O'Reilly	£10.95
2	MFC Internals (Book/Disk)	Addison-Wesley	£33.95
3	Core Java: SunSoft Java Series (Book/CD)	Prentice-Hall	£32.95
4	Lotus Notes 4 Administrator's Survival Guide (Book/CD)	Sams	£52.50
5	Learning Perl	O'Reilly	£18.50
6	Programming Perl	O'Reilly	£22.00
7	Rapid Development: Training Wild Software Schedules	Microsoft Press	£32.49
8	HTML: Definitive Guide	O'Reilly	£20.50
9	CGI Programming on the World Wide Web	O'Reilly	£26.00
10	Hitchhiker's Guide to Vis. Basic & SQL Server (Book/CD)	Microsoft Press	£41.99

List supplied by The PC BookShop, 11 & 21 Sicilian Avenue, London WC1A 2HQ
Tel: 0171 831 0022. Fax: 0171 831 0443

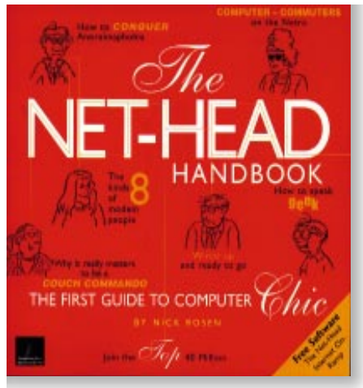
Until the expected glut of intranet books arrive, *The Corporate Intranet* stands as a good introduction.

PJ Fisher

The Net-Head Handbook

Witty, up-beat and user-friendly — that's the promise of this throwaway-style guide to the internet. It makes a change from the heavy manuals normally despatched to *PCW*. Despite its humorous approach this is nevertheless just another guide to the net, complete with website listings and a glossary of terms which is as dry as anyone else's. So, it's another internet cash-in.

It's funny in places, but unfortunately someone told Nick Rosen that if you write a book on the internet, you musn't forget to attack Bill Gates. He does so in the somewhat bizarre chapter, Net Pioneers, where you will also find Tim Berners-Lee (yeah, OK), Charles Babbage *and* his mistress Ada Lady Lovelace (huh??) and the founder of IBM, Herman Hollerith. Are you sure about this, Nick? The obligatory history of the internet is flaky, which I suppose would only be a crime if it were of any relevance.



This publication looks and feels like one of those novelty books that come out in time for Christmas… but hey, hang on, it is! Give it to someone you don't like and tell them to log on with the free IBM access disks stuck on the inside back cover.

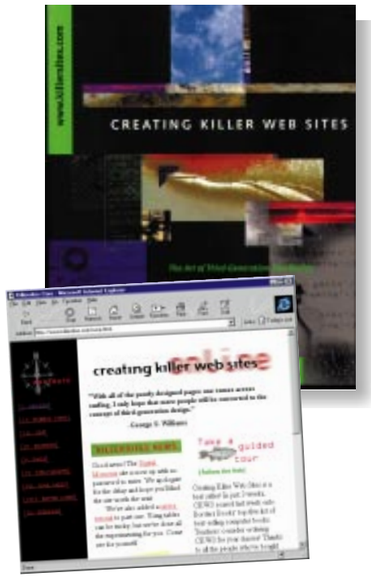
Joe Young

Creating Killer Websites

Last month I reviewed what I described as the first HTML book written from a designer's point of view. Lo and behold, one month later, another arrives. It's a beautifully-produced book which uses the kind of production values not normally found in this sector: glossy art paper and a varnished cover. It makes the featured websites look very rich indeed, which encourages you to produce stuff that looks equally as good.

David Siegel's philosophy reads: "Third-generation site designers carefully specify the position and relationships of all elements on the page, retaining fine control of the layout. Third-generation sites use metaphor and visual themes to entice and guide, creating a whole experience for surfers from the first splash screen to the exit." He believes a third-generation website should make you feel as if you're not even on the web.

Fine, but even a designer as talented as Siegel is perhaps missing the point. Despite the elegance of what he says, he is still taking core design principles from centuries of print design and applying it to the web. The principles work because Siegel's sites look better than many, but the web offers new opportunities in which he does not seem interested: database integration, group working and interaction, for instance. The web can be more than a pretty face, but we still await the day when the designers and the geeks get together and revolutionise information.



That said, design *is* important, and this book is one of the finest available for that area of web design: it will find a place on many a designer's (if not geek's) bookshelf. It deserves credit for using the web instead of the usual CD-ROM. There is a constantly updated website full of information and software to download at www.killersites.com.

PJ Fisher

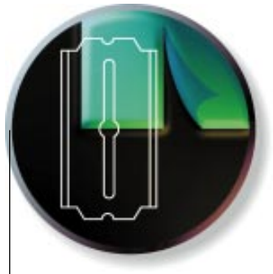
•PCW Contacts

Safe Surfing: A Family Guide to the Net
Author Julie McKeehan
Publisher AP Professional
ISBN 0-12-484834-6
Price £24.95
Rating ★ ★ ★ ★

The Corporate Intranet
Author Ryan Bernard
Publisher John Wiley & Sons
ISBN 0-471-14929-2
Price £22.94
Rating ★ ★ ★

The Net-Head Handbook
Author Nick Rosen
Publisher Hodder & Stoughton
ISBN 0-340-67207-2
Price £9.99
Rating ★ ★

Creating Killer Websites
Author David Siegel
Publisher Prentice Hall
ISBN 1-56830-289-4
Price £39.95
Rating ★ ★ ★



Ground control

Cool ideas from The Man Who Fell To Earth are becoming reality, says **Toby Howard**. What a carry on: **Tim Frost** looks forward to using his notebook as a portable video recorder. **Jim Smith** takes a peek at the new internet protocol, known to nerds everywhere as IPng.

The digital Malteser

Take a crystal the size of a Malteser, faster than a speeding CD, and store holographic data on it? Crazy idea? You'd be surprised. In the film The Man Who Fell To Earth, an alien, played by David Bowie, visits our planet on a mission to save his dehydrated world from extinction. To raise the vast sums of money needed to build a rescue ship, he rapidly patents hundreds of out-of-this-world inventions based on his own planet's highly advanced technology and creates World Enterprises, a multi-billion dollar corporation. One of the company's amazing gadgets stores hours of hi-fidelity stereo music, encoded in the molecular structure of a metallic ball the size of a Malteser. Such technology may soon be within our own, terrestrial, grasp.

"So you see, just one of these metallic balls can hold my entire back catalogue." ***(Filmstill courtesy of the Kobal Collection)***

The last decade has seen extraordinary advances in data storage. One idea offers huge increases in speed and capacity, throwing in massively parallel super-fast data transfer for good measure. Enormous amounts of data are stored as interference holograms in a single crystal the size of a sugar cube, with no moving parts.

When two beams of light overlap, the crests and troughs of their waves interact to produce patterns of interference; you can see this effect in the beautiful colours on the surface of a soap bubble and in the supernumerary arcs of a rainbow. The use of interference for storing and reproducing images is not a new idea: it was first demonstrated in 1810 by Thomas Seebeck. In 1908, the French physicist Gabriel-Jonas Lippman was awarded the Nobel prize for his work on "interference heliography", a method of colour photography. But accurate control of interference was impossible without extremely pure light, and it was not until the invention of the laser that the science of holography became practical.

To record a hologram of an object, light from a laser is split into two beams. One beam, the "signal", is reflected off the object onto photographic film where it meets the other "reference" beam, which has travelled direct from the laser. The two beams interfere and the resulting pattern of light and shade is recorded on the film. If the image of the interference pattern is subsequently illuminated by the reference beam, the signal beam is re-created.

Because the interference pattern represents the intersection of two, three-dimensional wavefronts, the reconstructed signal beam is a true three-dimensional image of the original object.

Digital holography works on a similar principle. As before, laser light is split into two beams: the "signal", which will be used to encode the binary data, and the "reference". The signal beam passes through a "spatial light modulator" which displays a "page" of digital data as a pattern of black-and-white squares, rather like a crossword grid. The light takes on the image of the data and the beam is then focused onto the holographic storage medium; typically a crystal of lithium niobate. At the focus point, the signal beam meets the reference beam and an interference pattern forms. The pattern very slightly distorts the molecular structure of the crystal and the data is recorded.

To read the data back, the reference beam is again fired at the crystal, and when it meets the stored interference pattern the original signal beam is regenerated. Focusing the signal beam onto an array of charged-coupled devices reveals the complete page of data.

The setup is very delicate. In order to successfully decode the hologram, the reference beam must be aligned at precisely the same angle used to record it. Although this means that the relative positioning of the beam and crystal must be finely controlled, it also implies that many different holograms can be stored in the same crystal by recording each one at a slightly different angle. This idea, known as "angle multiplexing", has been used by researchers at the California Institute of Technology to store 5,000 high-resolution images simultaneously in a single, one cubic centimetre crystal .

The technique can be taken a step further using "spatial multiplexing", with thousands of crystals arranged on the surface of a disk. Each crystal holds many angle-multiplexed holograms, as before, but the overall storage capacity is vastly increased by optically selecting each crystal for reading/writing. Experimental versions have been built, employing sheets of hologram-sensitive polymer film.

With the rapid increases in the speed and storage capacity of traditional magnetic media, exotic technologies like holography might appear to be of only academic interest. In August last year, the Californian company Holoplex announced the first commercial product based on this technology, capable of storing and matching 1,000 fingerprints. Although the overall data capacity is only 300Mb (half that of a conventional CD), all the data can be read in parallel in one second.

Government, industry and academia are taking digital holography very seriously. In 1995, a five-year programme was established in the US to the tune of $32m, with 50 percent of the funding coming from the US Defense Department. The key players include IBM, Kodak, Rockwell, and several universities. The goal is to build a system which can store 128Gb with a transfer rate of 1Gb per second.

It is likely that the prospect of holographic storage with 1,000 times the capacity and speed of today's CDs will usher in whole new applications of interactive video on demand, massive image libraries, and, quite possibly, little musical Maltesers.

Toby Howard

The Internet is doomed

The quaint old 32-bit addressing scheme that the internet currently uses to keep track of all its hosts will eventually run out of room for expansion, and the whole system will come to a grinding halt.

The fact that IP (Internet Protocol, the routing part of TCP/IP) has a life expectancy of less than a few years has led the internet's designer, the Internet Engineering Task Force (IETF), to propose a radical new standard that fixes the population growth problem. It goes way beyond that in addressing a long wish-list of internet wants.

The new protocol, IPv6 (aka IPng, for next generation — it's a nerd thing) takes internet address space up to 128 bits, which gives us enough room to give every star in the Milky Way a unique IP address and still have room for every cell in the human body.

Oddly enough, this is an appropriate metaphor, as the other aim of IPv6 is to extend the internet into brand new areas. IPv6 is designed to allow consumer devices such as televisions, control devices such as thermostats and mobile PDAs to all take advantage of the open network.

It does this in a number of ways. For one thing, IPv6 is designed to be easier to implement than its predecessor, IPv4. IPv5 is a separate but related protocol, without the scope of IPv6. It can be run with lower overheads, both in terms of memory and processor power.

This will make it easier to produce one-chip packages that can simply be plugged into standard consumer TVs or control equipment, lowering the cost of making such products superhighway-capable.

The other way IPv6 makes an entertainment revolution on the net possible is by allowing real-time connection for the first time. The only way to maintain a near real-time stream of information over the net is by blatting out many times more UDP (user datagram protocol) packets than you need to, to allow for some packets getting lost in transit. This is how real-time web technologies like RealAudio and CUSeeMe work. A UDP packet is connection-less, meaning that, unlike a normal TCP packet, the network does not have to check its integrity along the way, thus speeding up its transport. No checking means no guarantee that it will get through. At times of high network traffic, a RealAudio data stream can lose the majority of its packets.

The other problem with the current protocol is that, within limits, it doesn't care when a packet arrives. It just reassembles them in the right order when they turn up. As anyone who's waited for Netscape's home page to load knows, the web is a very patient place.

Real-time data transmission isn't patient. An application running in real-time needs to know now whether it's going to get the information it needs or whether it will have to interpolate (all those weird noises in RealAudio). So IPv6 tightens up the latency limit for real-time applications, and gives packets with real-time needs a way to barge through internet roadblocks. "Delay sensitive traffic", as the protocol calls it, has a 24-bit header tacked on to it that marks it as urgent and gives it a fast path through the net.

To further accelerate the supply of data, IPv6 comes with support for ATM (Asynchronous Transfer Mode), the ultra-wide networking technology that will provide the multimedia internet with its backbone.

With all this new information floating around the web, from Brazilian soaps to temperatures at chicken farms, there's that much more to hack. To protect against eavesdropping, IPv6 comes with built-in secure encryption at the packet level. IPv4 is free of such fripperies, leaving it up to companies such as Netscape to add security to the IP networking layer with products such as the Secure Sockets Layer.

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But the whole IPv6 project began as a riposte to exactly that kind of semi-proprietary innovation. The IETF feared that the internet, which is, after all, less a technological marvel than one of computing diplomacy, would be stifled by competing standards in the areas it believes will grow fastest. These are entertainment, security and low-overhead networking, which are just the areas the protocol covers.

There are now IPv6 stacks for most of the popular hardware types found on the internet like Suns, PCs, Macs and AS/400s. As IPv6 creeps out of its theoretical beginnings into the real world, it will be judged by whether it can meet the goal of keeping the internet hooked on open standards or whether the internet will be another tower of Babel, an ambitious project destroyed by our inability to speak the same language.

Jim Smith

Zooming in on notebooks

The PCMCIA is proposing the Zoom Video Port specification as a low-cost option to enable the average notebook user to add multimedia functions.

In the future, notebook PC users are just as likely to want to use video-intensive programs as those using desktop PCs. While, in the long term, notebooks will include MPEG and high-power VGA chips, these chips are going to be too expensive, too large and too power-hungry for the next generation or so of notebooks. The obvious answer is to use the PC card (PCMCIA) slot for add-on video importing or MPEG video decoding. The only problem with this approach is that the standard PC card structure is not exactly set up for moving video or audio, with the video signals going through the system bus rather than directly into the VGA controller.

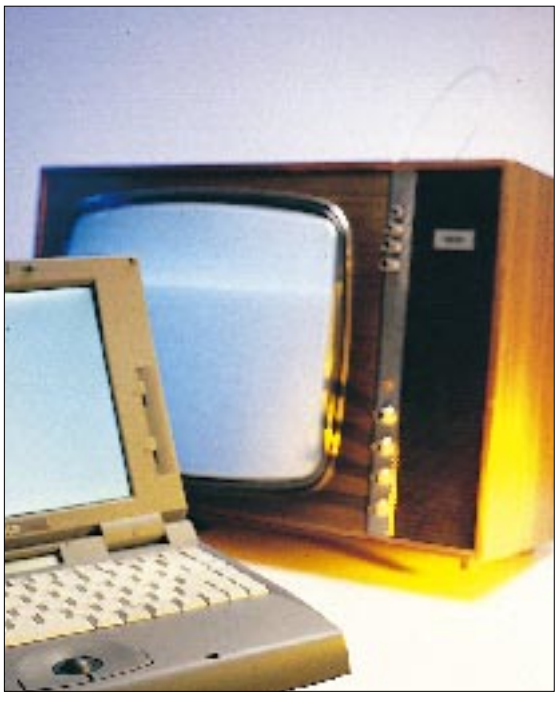
In response to this potential problem, the PCMCIA organisation that sets the PC card standards has come up with the Zoom Video Port (ZV) specification which makes CD-based MPEG a practical reality as an add-on device for notebook PCs.

The proposal was originally presented last year by Cirrus Logic, specifically as a way of allowing external multimedia hardware to be used with the next generation of notebook computers.

The driving force behind it is to avoid building full multimedia facilities into mid- and low-cost notebook PCs, yet still allow users to add on serious MM (multimedia) functions should they want to, as an after-market upgrade.

The new Zoom Video Port uses the same mechanical configuration of the PC card socket. In standard mode, with a memory or modem card for example, the system works in the normal way with hot plug-in and power-on functions. But as soon as an MM PC card is slotted in, some of the pin connections are software re-assigned to route information through to the VGA controller and the audio codec.

The PCMCIA organisation cites several specific applications on which it expects the ZV port to be used. The first is to connect up a notebook to a real-time video source. This can be any TV source: a video, TV or camcorder signal which needs to support 50 or 60 fields of interlaced video. In principle, a single PCI bus should be able to pass this information through without any problems but in practice it is not something that can always be guaranteed, and users want the system to work reliably. So, by introducing a dedicated ZV bus, the data-stream can flow directly to its destination — the VGA controller.



The PCMCIA also thinks that there will be some need for video capture on a notebook PC. With the application of MPEG encoding and larger hard disks, there is no reason that a notebook couldn't be used as a mobile video recorder, or at least as a simple video editing device.

This means sending the video to the display and the hard disk simultaneously, requiring a PCI bus mastering controller. The ZV card feeds the signal directly to the VGA controller, so leaving the CPU to handle just the capture-to-disk operation.

Probably the application that is going to be most of interest to the general user is games playing. Games are moving forward with the addition of video inserts, currently using standard PC codec formats but likely to embrace MPEG in the not-too-distant future. And then there is 3D graphics, which is becoming self-evidently more important. And finally, games that rely heavily on combining both. Combined MPEG video/3D games put more strain on a PC than plain MPEG video decoding. The PCI bus can handle the MPEG stream but the MPEG game needs to keep the video flowing while busily rendering the 3D images and mixing them together. Routing the video direct to the frame buffer gives the CPU almost 100 percent utilisation of the PCI bus for graphic rendering and then for feeding it into the same frame buffer.

ZV raises a whole raft of questions about how, and for what, the notebook PC may be used in the future. The video capture capability does put it into the realms of the PC video recorder, although hard disks do not really seriously challenge the cost-per-minute of camcorder tapes. The experience of using portable PCs for audio recording, which is a practical reality, has been restricted to a small number of radio reporters who use them for the ability to record short interviews and edit them on the spot, and then use the PC with its modem to deliver the interview back to the radio station using ISDN. Video recording on the notebook PC may follow this same route with anyone who needs to capture small video clips using a notebook because it can capture, edit and then dump the result onto tape or play it out on-screen without having to transfer loads of video between computers or tape machines.

Universal applications for the video-capable notebook are as a portable or second TV, video player, using DVD, and as a laptop games machine with the capabilities of the best consoles. So, you'll be able to waste as much time on your laptop as you can on your main PC.

Tim Frost

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'd prefer) and we'll pay hard cash for longer, more involved pieces. Please include relevant screenshots in .GIF format.
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Workshop

Operating Systems

Applications

Programming

and the rest...

NEW!

Question time

Which database querying tool is text-based and reactionary, yet immensely adaptable and even a boon in some social circles? Why, SQL of course. In the first part of our new tutorial, Mark Whitehorn introduces the basics.

SQL stands for Structured Query Language, which is referred to either as its individual letters or is called "Sequel". It appears as if the former reference is more common in the UK and the latter in the US, but as the two are interchangeable don't let it be a cause of anxiety.

Despite many similarities to C, Pascal, BASIC *et al*, SQL is not a programming language. It is a data access language or data sub-language. As such, it is a very restricted language which deals only with how tables of data can be manipulated. It lacks many of the other features (such as the ability to write information to a particular place on the screen) which characterise a full programming language.

Using SQL

SQL is often described as a standard, but when you actually start using it you find that, like many standards, it's not as standard as all that.

The examples given here are in a generic form of SQL: you may well find discrepancies depending on the actual version used. For example, the generic DISTINCT becomes DISTINCTROW in Microsoft's Access. Having said that, the differences are not great, and should not pose serious problems.

The name itself ("SQL") is somewhat misleading as it implies that this sub-language is concerned exclusively with querying. In fact, the language is sufficiently rich to allow the user to perform many other operations such as creating tables, but it remains true that the most common usage of the language is to ask questions of a database. This part of the language comprises the Data Manipulation Language (DML) statements of SQL.

DML statements are, by convention, written in UPPERCASE. The first ones we'll look at are SELECT, FROM, DISTINCT and WHERE. The sample tables shown in Fig 1 will be used for the examples.

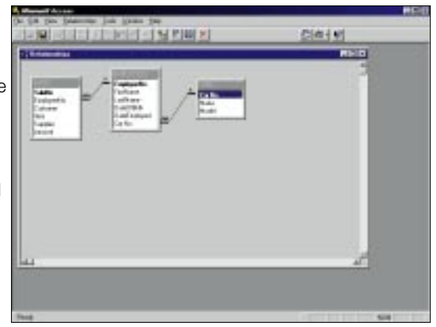

Fig 1 **The sample files used in my examples**

SELECT & FROM

The first statement, SELECT, is used to extract a collection of fields from a given table. FROM simply directs attention to the table in question. Therefore, the statement

```
SELECT SaleNo, Item, Amount
FROM SALES;
```

will yield the following;

SaleNo	Item	Amount
1	Sofa	£235.67
2	Chair	£453.78
3	Stool	£82.78
4	Suite	£3,421.00
5	Sofa	£235.67
6	Sofa	£235.67
7	Bed	£453.00

SQL doesn't eliminate duplicates by default, so:

```
SELECT Item, Amount
FROM SALES;
```

will yield

Item	Amount
Sofa	£235.67
Chair	£453.78
Stool	£82.78
Suite	£3,421.00
Sofa	£235.67
Sofa	£235.67
Bed	£453.00

DISTINCT

You can force SQL to remove the duplicates by using the statement DISTINCT, which dictates that all rows in the answer table must be unique. The query

```
SELECT DISTINCT Item, Amount
FROM SALES;
```

produces:

Item	Amount
Bed	£453.00
Chair	£453.78
Sofa	£235.67
Stool	£82.78
Suite	£3,421.00

WHERE

SELECT lets you choose the fields with which to work, and WHERE lets you choose the records.

```
SELECT Item, Amount
FROM SALES
WHERE Item = 'Sofa';
```

produces

Item	Amount
Sofa	£235.67
Sofa	£235.67
Sofa	£235.67

while

```
SELECT Item, Amount
FROM SALES
WHERE Item = 'Sofa' AND Customer =
'Smith';
```

yields

Item	Amount
Sofa	£235.67

All sorts of variations are already possible, combining SELECT and WHERE statements: as you can see from the last example, WHERE clauses can contain conditions.

Fig 2 One record found

EmployeeNo	FirstName	LastName	Date of Birth	DateEmployed
2	John	Greeves	21 March 1967	01 January 1990

Conditions

We'll digress here to cover the range of Conditions that are acceptable within a WHERE clause. Conditions typically consist of logical expressions which can be evaluated for truth; in other words, they are checked to discover whether they are true or false.

Thus if we use the SQL statement

```
SELECT EmployeeNo, FirstName,
LastName, DateOfBirth, DateEmployed
FROM EMPLOYEES
WHERE EmployeeNo = 2;
```

then we can expect the RDBMS to examine every record in the EMPLOYEE table, and place in the answer table only those records for which the condition

```
WHERE EmployeeNo = 2
```

is true. As you'd hope, this is only true for one record (Fig 2).

A condition is constructed from operators such as those shown in Fig 3.

The logical operators in Fig 4 have a lower priority than those above and are therefore processed after them, unless brackets are used to alter precedence.

The following SQL statement asks for a table of the items and amounts from the Sales table for sale numbers greater than six:

```
SELECT Item, Amount
FROM SALES
WHERE SaleNo > 6;
```

Item	Amount
Bed	£453.00

while this one only wants to see records for sofas for sale numbers greater than six;

```
SELECT Item, Amount
FROM SALES
WHERE Item = 'Sofa' AND SaleNo > 6;
```

There are none.

This next statement asks for all records for sofas, suites and beds, regardless of sale number:

```
SELECT Item, Amount
FROM SALES
WHERE Item IN ('Sofa', 'Suite',
'Bed');
```

Item	Amount
Sofa	£235.67
Suite	£3,421.00
Sofa	£235.67
Sofa	£235.67
Bed	£453.00

and this one adds a condition which specifies records for the same three pieces of furniture with sale numbers greater than six:

```
SELECT Item, Amount
FROM SALES
WHERE Item IN ('Sofa', 'Suite',
'Bed') AND SaleNo > 6;
```

Item	Amount
Bed	£453.00

Conditions are nothing if not logical, and rendering a series of conditions into plain English is a good way of understanding what it will do in practice.

ORDER BY

Another useful command is ORDER BY. It gives you control over the order in which records appear in the answer table generated by the query. You specify the field by which you want records ordered, as in the following statement:

```
SELECT Item, Amount
FROM SALES
WHERE Item = 'Sofa'
ORDER BY SaleNo;
```

where the records are ordered by the number of each sale, with the default being in ascending order. If you feel you want to specify this, the command is ASC, as shown below:

```
SELECT Item, Amount
FROM SALES
WHERE SaleNo > 6
ORDER BY Item ASC;
```

It's a perfectly acceptable statement, but it's tautological. The next statement:

```
SELECT Item, Amount
FROM SALES
WHERE SaleNo > 6
ORDER BY Item DESC;
```

will produce exactly the same data but will be sorted differently, as DESC, as you'll have gathered, sorts records in descending order. You can use sorts in both directions:

```
SELECT Item, Customer, SaleNo,
Amount
FROM SALES
WHERE SaleNo > 0
ORDER BY Customer ASC, Amount DESC;
```

Note that Amount doesn't *have* to be in the SELECT statement to be used for sorting the records in the answer table, although this would often be the case.

This will sort the customer records in ascending order, with the amounts each customer has spent shown in descending order.

Item	Customer	SaleNo	Amount
Chair	Johnson	2	£453.78

Fig 3 Operators

Symbol	Meaning	Example	Notes	Records returned from Employee table
=	Equal to	EmployeeNo = 2		1
>	Greater than	EmployeeNo > 2		2
<	Less than	EmployeeNo < 2		1
<>	Not equal to	EmployeeNo <> 2		3
>=	Greater than or Equal to	EmployeeNo >= 2		3
<=	Less than or Equal to	EmployeeNo <= 2		2
IN	Equal to a value within a collection of values	EmployeeNo IN (2, 3, 4)		3
LIKE	Similar to	LastName LIKE "Gr*"	Finds Greeves and Groves. Uses wildcards. Wild cards vary between SQL implementations.	2
BETWEEN…AND	Within a range of values, including the two values which define the limits	EmployeeNo BETWEEN 2 AND 4	Equivalent to: EmployeeNo IN (2, 3, 4)	3
IS NULL	Field does not contain a value	DateEmployed IS NULL		0

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Fig 4 Logical operators

Symbol	Meaning	Example	Notes	Records returned from Sales table
AND	Both expressions must be true in order for the entire expression to be judged true	SaleNo > 3 AND Customer = "Smith"	AND is evaluated before OR	1
OR	If either or both expressions are true, the entire expression is judged to be true	SaleNo > 3 OR Customer = "Smith"	AND is evaluated before OR	5
NOT	Inverts Truth	SaleNo NOT IN (2, 3, 4)	(just as well it isn't available for the real world!)	4

Suite	Jones	4	£3,421.00
Bed	Jones	7	£453.00
Sofa	Simpson	6	£235.67
Sofa	Simpson	1	£235.67
Sofa	Smith	5	£235.67
Stool	Smith	3	£82.78

Wild cards

Wild cards are used in SQL much as they are used elsewhere, for occasions where you want a range of data that fits a certain pattern. The variation below is not uncommon:

```
SELECT *
FROM SALES
WHERE SaleNo > 1;
```

In this case, the * symbol is used as a wild card, meaning "all Fields".

Fig 5 Records from SALES table

Sale No.	Employee No.	Customer	Item	Supplier	Amount
3	2	Smith	Stool	Ford	£82.78
4	2	Jones	Suite	Harrison	£3,421.00
5	3	Smith	Sofa	Harrison	£235.67

Sub-queries

The use of conditions can be expanded into sub-queries to add further refinement to queries. In the following example:

```
SELECT Customer
FROM SALES
WHERE EmployeeNo IN
   (SELECT EmployeeNo
    FROM EMPLOYEES
    WHERE DateEmployed > 12/5/89);
```

the statement inside brackets is known as a sub-query and would work perfectly happily as a query all on its own. (Incidentally, this is a good case where dialects of SQL differ. Access requires that the date be wrapped up in # symbols, thus the last line would read as

```
WHERE DateEmployed > #12/5/89#)
```

Any operation performed on a table (or tables) results in another table — one containing the answer. This is termed "closure" and it is an invariable rule. The aforementioned sub-query produces an answer table, shown here:

EmployeeNo
2
3
4

By looking at the answer table generated by the sub-query, we can see that the original statement in its full form can be simplified to:

```
SELECT Customer
FROM SALES
WHERE EmployeeNo IN (2,3,4)
```

and the records from the SALES table for which this is true are shown in Fig 5.

So the query actually yields:

Customer
Smith
Jones
Smith

We can eliminate the duplicate records by adding the word Distinct to the first line of the SQL command.

■ There will be more on honing your SQL skills in part 2 of this workshop next month.

Boot fetish

Tim Nott does battle with bootups yet again, and "MSDOS Compatibility Mode" strikes a chord with readers. Some new Powertoys have a calming influence.

Charles Kirk read July's Windows 3.1 Hands On column, and wants to know if there is a similar method in Windows 95 for choosing whether to boot into DOS or Windows 95. "I find the F8 key option tedious. If my concentration lapses and I miss the moment, I end up in Windows 95 which does not like being interrupted and takes an age to load. When running an application in MSDOS mode, rather than a windowed DOS session, Windows restarts when the program is closed. I then have a long wait before I can switch off. I am not a patient man."

There are several things you can do, which involve editing the file MSDOS.SYS. This resides in the root of your boot drive and, unlike its DOS predecessors, is a plain text file. It is hidden and read-only, so open C:, go to View/Options/View and select "Show all files". Right click on MSDOS.SYS, choose "Properties" and uncheck the "Hidden" and "Read only" options. Then open it with Notepad. You'll see a section headed Options, to which you can add the following line:

```
BootDelay=n
```

where n is the number of seconds allowed to hit the F8 key after the "Starting Windows 95…" message appears. The default is 2. A better way is to add

```
BootMenu=1
```

which will always give you the boot options menu without having to press F8.

```
BootMenuDefault=n
```

chooses the default action if no key is pressed. This corresponds to the numbering of the menu items, and

```
BootMenuDelay=n
```

gives the number of seconds before that action is taken. It defaults to 30.

```
BootGUI=0
```

Use this without any of the options to stay with the C:\ prompt (equivalent to choosing "6. Command prompt only" on the menu). You can then do your MSDOS business, and either just switch off the PC or type "WIN" to load Windows. Remember to reset the properties of MSDOS.SYS to hidden, read-only after editing.

As a postscript, thanks very much to Ryan of London E14, who sent some tips on the boot menu, including the following invaluable information. "Normal: Start up Windows normally. Logged: I don't know what it does but it took a long time to start up Windows…". Empirically impeccable, Ryan, if a little lacking in hard information. What it does is create a file called BOOTLOG.TXT, recording the loading of all Windows' devices and drivers.

Compatibility blues

My woes in *PCW* (June 1996) ("If at first you don't succeed....give up") struck chords with several readers whose systems had also started running in "MSDOS compatibility mode". This slows disk access down and seems to happen for no apparent reason. Control Panel/System/Performance reports that you have an "unknown driver" in CONFIG.SYS or AUTOEXEC.BAT, even if you don't have either of those two files. Despite virus-checking and attempting to re-install the affected devices, I couldn't make this go away and ended up reinstalling Windows. It seems to be a "your mileage may vary" problem. There are a variety of answers, not all of which work for all users.

Someone who signs his or herself GrantsV mailed-in one solution: "I too have had the frequent joys of running in MSDOS Compatibility Mode when I install my backup HDD alongside my ordinary HDD, and load Win95. I have solved this little, if very irritating, Win95 bug. Remove your hard disk controllers from Device Manager, then 'Add New Hardware' and hey presto."

I tried that at the time but it didn't work for me. David Mulvaney had the problem on his home and work machines. "I thought it may be something due to the boot sector, so I replaced the hard disk master boot record using the FDISK/MBR command (you need DOS 5 or later), then from my Windows 95 Startup disk used the SYS command (A:> SYS C:) to replace the DOS boot sector." I haven't tried this, as the problem hasn't returned, but be careful with the FDISK command as you can destroy all the data on your hard disk. The /MBR switch isn't documented in the DOS help, but according to the MS Knowledge Base it "should not be used if the disk was partitioned using Storage Dimensions' SpeedStor utility with the /Bootall option, or more than 4 partitions exist or certain dual-boot programs are in use."

Simon Pomeroy got the problem when plugging in a removable hard disk and had to re-install Windows. Mike Turner-Sterling also had this happen after installing an Etherlink card. "To cut a long story short, Microsoft says this is a hardware problem. I have had an engineer on-site three times and, although we can recreate the problem with ease, we cannot cure it."

David Beattie of Gravesend also had the problem. He renamed AUTOEXEC.BAT and CONFIG.SYS so they would not be processed. Having rebooted, everything still worked but he was still in MSDOS compatibility mode. Next time he shut down and rebooted, lo and behold, he was back at optimal performance. "For no particular reason I thought I'd put AUTOEXEC.BAT and CONFIG.SYS back to normal and the machine still ran at optimal performance."

The Knowledge Base has quite a lot to say on the subject of MSDOS compatibility mode, including a reference to "Unknown hooker MBRINT13". It goes on to explain that you may find a clue in a file named IOS.LOG, situated in the Windows folder, or by pressing F8 at boot and choosing to create a BOOTLOG.TXT file. It doesn't go much of the way to explain why this should happen out of the blue, when there are no CONFIG or AUTOEXEC conflicts and no new hardware.

In my case, where no new hardware or disk changing was involved, the virus theory looks the most likely, despite the lack of alarms from the usually reliable McAfee. Fraser Smith had the same problem and wrote that "Thunderbyte, S&S and McAfee failed to detect a virus, yet Norton came up with WelcomeB. It just goes to show that virus checkers are not infallible."

I did come up with a quick fix for the situation where anti-virus software fails, as in Fraser's case, yet an unknown 16-bit TSR/driver has apparently been loaded before Windows 95. All you need is a bootable floppy disk. Copy SYS.COM to this floppy and set write-protect on. In the event of something tampering with your BOOT sector, booting from the floppy and running SYS C: from the prompt will replace the offending boot sector." That would seem to be supported by David Mulvaney's experience, although it's worth trying SYS on its own before the more scary FDISK/MBR stuff. In the meantime, beware of "unknown hookers" bearing viruses.

Powertoys revisited

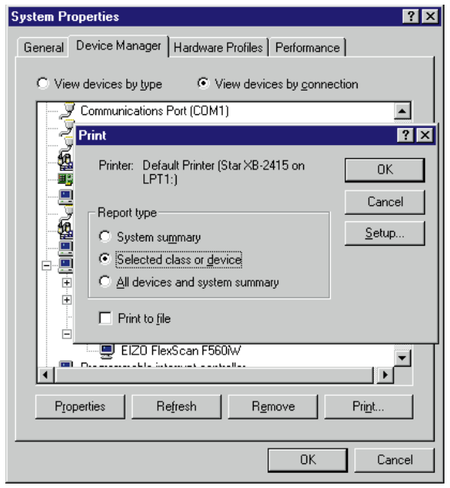
I think I'm starting to get the hang of this desktop thing. Apart from the shortcuts that Windows installs there, I find I tend to use it for temporary things like shortcuts to folders and documents I'm working on, screenshots, copies of email messages, to-do lists and so on.

Like junk on my real desk, it tends to pile up, and the thing that I really find annoying is that the icon I want is always buried beneath a stack of windows. Even though I've got an enhanced keyboard, where the Windows + M keys will minimise everything (you can do this on a normal keyboard with Ctrl + Esc, Esc, Alt + M), I've never really got into the habit of doing this, or right-clicking on the Taskbar and selecting "Minimize all Windows".

Although it's attractively ruthless, like sweeping the contents of a real desk on to the floor, it's often similarly counter-productive. If you want to drag an icon into an open folder or application, you either have to restore the minimised destination and then move it out of the way, or drag the icon to its taskbar button, wait for it to open while still holding down the mouse button, then drag it back up. If you let go of the mouse button, you have to start again. One answer is to have a shortcut to the desktop. You can put this in the Startup folder so you can access the desktop folder from one

All you ever wanted to know...

Just to make a change from things going wrong, here's a tip for when everything is gong absolutely swimmingly. Open the System icon in Control Panel and select the Device Manager tab. Click on the Print button. You'll get a choice of a System Summary with or without details of all devices and drivers. The former runs to two pages, the latter to nine on my PC, though real power-users claim thirteen or more. Keep this somewhere safe and it should save much messing around should you get any hardware conflicts. Thanks to Andrew Katz for that advice.



Print those hardware settings now, while it's all working

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click on the Taskbar.

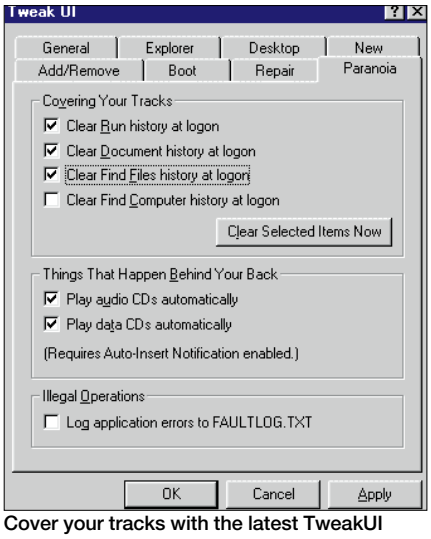
The snag with this is that it reveals the difference between the physical folder, c:\windows\desktop, and the metaphysical desktop entity that sits at the top of the tree containing c:\windows\desktop and all the stuff like My Computer and the Recycle Bin. In other words, the latter aren't shown in the folder. You can create shortcuts to them, but then you'll find that the metaphysical Desktop has both the "real" My Computer and Recycle Bin and the shortcuts as well. What a mess!

Enter the latest issue of Powertoys. If you missed out on previous versions, Powertoys is a collection of unofficial Microsoft add-ons and utilities. They are free, they're on this month's CD and pack an amazing amount into the quarter-megabyte file. The installation can be a little confusing, so copy PWRTY4_7.EXE to a temporary folder and run it. It's an MSDOS (ho ho) self-extracting file, and will expand into .INF, .EXE and other files. Somewhere in that lot will be README.TXT, so do. You can then right-click on INSTALL.INF (if you have the folder View/Options/View/Hide MSDOS file extensions checked you'll just see INSTALL) and select Install. If it starts moaning that it can't find files or asking for disks, it's probably because your temporary folder has a long filename. It is rather daft, but that's Microsoft and ours is not to reason why, so rename it to an eight-letter or shorter one.

Once installed, restart Windows and you'll find a whole lot of new goodies to play with. You can also install them piecemeal as each Powertoy has its own .INF file. However, it's probably easier to install everything and then remove anything you don't need from Control Panel/Add-Remove Programs.

There's a lot here and as such I'm going to leave things like the round clock, the enhanced CD Autoplay gizmo, the truly wonderful Quickres and the truly horrible Xmouse as an exercise for the reader, and concentrate on the real goodies. Getting back to what I was banging on about earlier, you'll find a new shortcut in your Startup folder called Deskmenu. This produces a corresponding icon in the System Tray. If you click on this, you'll see a menu of everything on the desktop.

Next stop is Control Panel to check out the latest version of TweakUI. I covered this back in February, but briefly it allows you to do all sorts of things that usually involve some heavy Registry editing. You can



Cover your tracks with the latest TweakUI

customise desktop icons, remove arrows from shortcuts, set boot options, disable "save settings" so that you don't start a new session by re-opening all the folders that you hadn't shut when you last closed down, and much more. Check out the Help file which you can reach from the "Tips" button on the "General" tab.

This version also brings some new stuff. There's a "Repair" tab for mending icons, the font folder, associations and system files, and there's also a wonderful section entitled "Paranoia". This is the answer to Stephen Hollis' query in August's column, as you can clear the contents of the Recent Documents list, the Run list, and the Find list either on a one-shot basis or automatically at logon.

Then there are all sorts of new right-click enhancements. You can "Send To…" various flavours of email and the command line, and copy the path of a file to the clipboard. You can see the contents of a folder as a menu without opening it, although this doesn't always seem to work, and start an MSDOS session in any folder. There's a System Tray to change your dialling location, and a driver to print to an HTML file from any application (you have to install this by right-clicking on HTML.INF).

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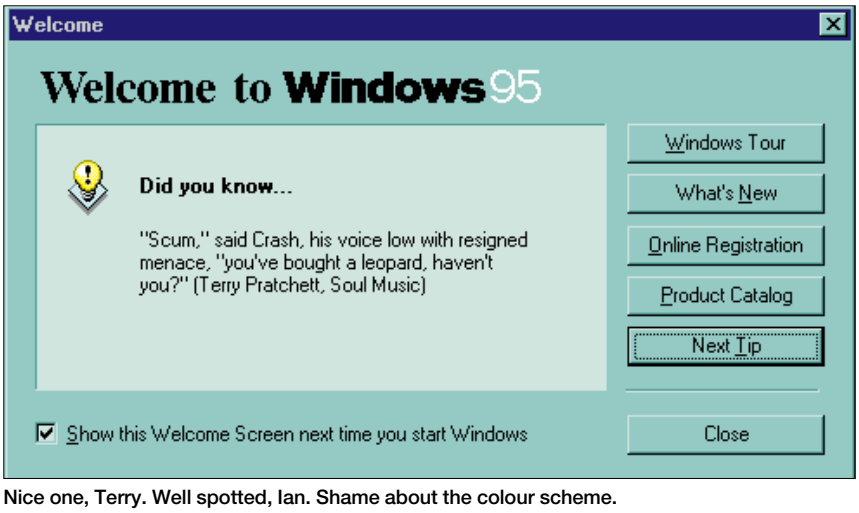
Tips, what tips?

Getting back to more serious matters. Where are your "Tips of the Day"? The response so far has been bitterly disappointing, with just one contributor. Fortunately, Ian Hogg, who describes himself as a writer, student and bon vivant, displayed a rare generosity of spirit with 48 tips. Well, Terry Pratchett's spirit, to be precise, as Ian is not so much a Pratchett fan as a complete ventilation and air-processing solution. All the quotes were either from Mr Pratchett's books, the man himself, or the alt.fan.pratchett Usenet newsgroup. A couple of the best include: "Luck is my middle name," said Rincewind, indistinctly. "Mind you, my first name is Bad." And: "This isn't life in the fast lane, it's life in the oncoming traffic."

Thanks, Ian, and if you could let us have a few tips on how you can combine being a student and a bon vivant without Resource Conflicts, I'm sure the readers would be glad to know. As for the rest of you, send me your tips, and later in the year I'll compile a complete Registry set for the cover CD.



Nice one, Terry. Well spotted, Ian. Shame about the colour scheme.

What's on **the menu?**

Advice on config.sys menu features from Tim Nott, and how to find those lost bits and pieces.

In July's column I described how you can use CHOICE.COM to offer alternatives on bootup. Thank you to Raymond Jones and Knut Jespersen who both pointed out a better way, which is the built-in CONFIG.SYS menu feature introduced with MSDOS 6. This is much more elegant and versatile, as it means you can control not just the commands processed by AUTOEXEC.BAT but those in CONFIG.SYS as well. Inevitably, it is rather more complicated.

Let's take a likely example. You've got a PC with a CD-ROM, sound card and mouse. Normally you boot straight into Windows, in which case you need the DOS CD-ROM drivers but not the mouse or sound-card drivers as these are taken care of within Windows. At other times you want to boot to the command prompt and need the mouse and sound card.

There is a utility called Interlink that you sometimes use for transferring files from a notebook PC via a serial cable connection. This needs to be loaded into memory before Windows starts, but you don't want to use that memory unnecessarily.

You may occasionally want to run your PC completely "stripped down" to diagnose problems or get a memory-hungry DOS game or application to load, so you need a choice of four configurations.

The easiest way to explain this is by using an example (Fig 1), with an imaginary set of CONFIG.SYS and AUTOEXEC.BAT. The former is broken into "blocks", each of which starts with a label enclosed in square brackets.

Fig 1 config.sys à la carte

```
CONFIG.SYS
[menu]
menuitem=windows, Start Windows
menuitem=dos, Normal DOS
menuitem=interlink, Windows with Interlink
menuitem=bare, Bare DOS
menudefault=windows, 5
menucolor=15,2

[common]
files=50
buffers=10
device=C:\himem.sys
shell=c:\dos\command.com c:\dos\ /p

[dos]
device=c:\cdrom\mycddriv.sys /D:MSCD001
device=c:\sound\dossound.sys
device=c:\dos\mymouse.sys

[windows]
device=c:\cdrom\mycddriv.sys /X /Y

[interlink]
include=windows

[bare]

[common]
```

The first section defines the subsequent sections of commands as well as their descriptions on the menu. The "menudefault" command sets the default choice and delay, and "menucolor" sets the background and text colours. So here we'll see, on booting, a numbered list of four items, starting with "1. Start Windows…". If no-one presses a key during the next five seconds, this will be the automatic choice and all will appear in vibrant yellow text on a blue background (see the panel, "Over the rainbow", page 261, for a list of the colour values).

The next section is entitled "common": it doesn't correspond to a menu choice but contains everything that's common to each (i.e. things that will always be loaded or set). After that come the individual menu-defined sections, each containing the relevant options over and above the common set you'll see. It doesn't matter in which order they come. You'll see that the (interlink) section has the "include=windows" line. This saves us copying the contents of the (windows) section line by line.

Although the [bare] section is empty, it must be present as it corresponds to a menu item. If omitted, you'll get an error message. There's another [common] section which is empty now, but if any third-party installation adds lines to the end of CONFIG.SYS they will be processed. If this was left out, they'd be tacked on to the [bare] section, which would cause much wailing and gnashing of teeth.

Life's a batch

The astute reader will notice that there is absolutely no difference between the "Start Windows" and "Interlink" choices at this stage. This has to wait until AUTOEXEC.BAT, which "remembers" the choice made in

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CONFIG.SYS as this is passed on as an environmental variable with the name CONFIG. A mythical AUTOEXEC.BAT might look like this:

```
AUTOEXEC.BAT
prompt=$p$g
set temp=c:\temp
c:\dos\smartdrv.exe
goto %config%

:windows
path c:\windows; c:\dos
mscdex.exe /D:mscd001
win
goto end

:dos
path c:\dos; c:\dosapps
mscdex.exe /D:mscd001
c:\sound\soundos.exe /X /Y
goto end

:interlink
path c:\windows; c:\dos
mscdex.exe /D:mscd001
interlink.exe
win
goto end

:bare

:end
```

Here, the first three lines constitute the common section, and the "GOTO %CONFIG%" command branches to a label that corresponds to the section header in CONFIG.SYS. This time, the labels are preceded by a colon rather than being enclosed in square brackets.

The "windows" section contains its own path command, loads the other part of the CD-ROM driver and starts Windows. The "DOS" section specifies a different path, loads the CD-ROM software and processes some imaginary command to initialise the sound card. The "Interlink" section does all the "windows" stuff, but loads INTERLINK.EXE as well, and the "bare" section doesn't do anything. Once again, it has to be present otherwise the "GOTO" command will produce a "label not found" error.

Note the very important "GOTO END" command after each section. It doesn't have to be "end" but a corresponding label must be placed at the end of AUTOEXEC.BAT. If you don't do this, the commands will run on, unlike the sections in CONFIG.SYS. So, on exiting Windows, the batch file would try to run mscdex.exe again, load interlink then restart windows.

If you want to be really clever and are familiar with batch programming, then you can also use the "IF" command with the CONFIG variable. In this case, CONFIG must be surrounded not just by percent signs but by double-quotes, too. Remember you can use SYSEDIT.EXE to edit CONFIG.SYS and AUTOEXEC.BAT side-by-side from within Windows.

Where are they now?

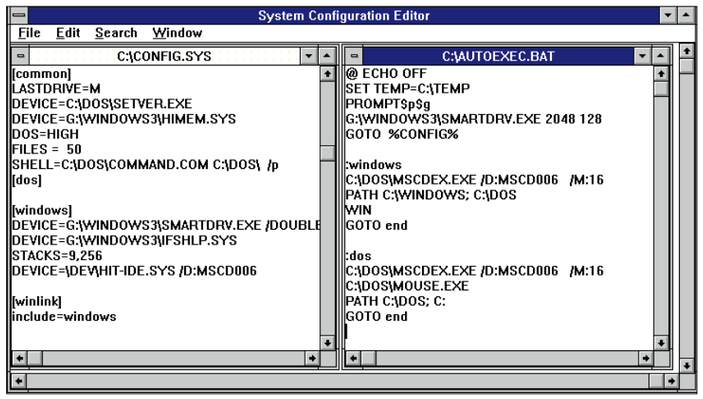
From time to time, bits and pieces of Windows may go missing. There's usually a fairly irrational reason for this, so before you reinstall check out the following guide to self-enlightenment:

Q. Where have all my TrueType fonts gone? They're all listed in WIN.INI, and the .FOT and .TTF files are all present but I can't see them on my word processor's list.

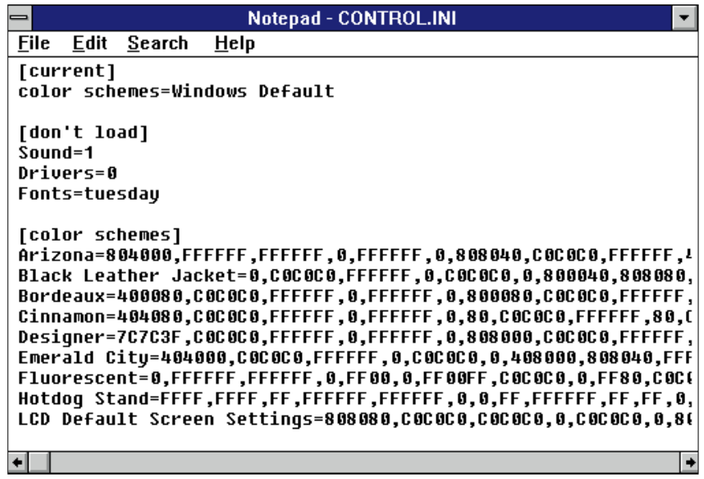
A. Do they all display correctly in Control Panel/Fonts?

Q. Yes.

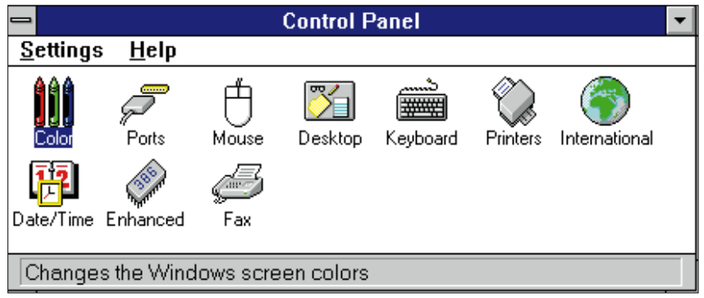
A. Have you clicked on the TrueType button and checked that TrueType is enabled?



Using Sysedit on AUTOEXEC and CONFIG. It makes backups as .SYD



It doesn't matter what it equals…



…if it's in [don't load] it won't load

Q. Of course. Do you take me for a fool?

A. No comment. Have you got a printer driver installed that will print TrueType?

Q. I most certainly have. It was all working yesterday.

A. Is it still set as the "Default Printer"?

Q. …I think I see the problem. The default printer is set to "Generic /Text Only".

A. Which, of course, doesn't support TrueType.

Q. OK, clever-clogs, now tell me where my icons have gone. I just see black blobs in Program Manager.

A. Have you upgraded your display card recently? Are you running in 16- or 24-bit colour?

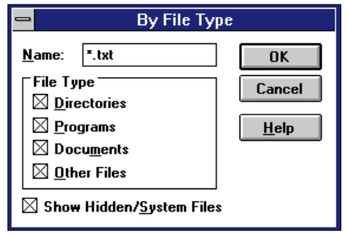
Q. 'pon my soul! If that's the same as 65,000 or 16.7 million, you're dead right.

A. This is a known bug. There's a memory limit in Program Manager groups which limits the size to 64Kb. This translates to around 18 icons in 24-bit depth. Use fewer colours, or split groups into smaller ones.

Q. And what about Control Panel? Some of the icons have disappeared completely.

A. Are all the .CPL files present? In Windows/System, you should have MAIN and CPWIN386. If you have multimedia stuff installed, you should also have DRIVERS and SND, and with MS Mail, FAX. You might also have third-party .CPLs for other devices.

If any of these are missing or damaged, you can reinstall them by using EXPAND.EXE on the original compressed files on the installation disks. Look for the corresponding .CP_ file. Another possibility is that there is a copy of KRNL386.EXE in the Windows directory. This should only be in WINDOWS\SYSTEM.



You'll only see files that match what's in the "Name" box

Q. They're all present, and apparently undamaged.

A. Then someone's been editing your CONTROL.INI and has added a [Don't Load] section. Anything listed under here (the names are the same as the Control Panel icons) followed by an equals sign, followed by anything, won't load.

Q. And what if Control Panel disappears altogether?

A. Once more, someone has been meddling in CONTROL.INI. If there is a negative value for X or Y given in the [MMCPL] section, then Control Panel is loading "off-screen".

Q. Good grief, there are some wicked people about. Now look, this is getting rather embarrassing as loads of files seem to have gone missing. According to DOS, there are 32 assorted files in this directory, but File Manager only shows README.TXT and REGISTER.TXT.

A. You haven't got the others set to "hidden" or "system", have you?

Q. Of course I haven't. And anyway, I've got "Show System/Files" checked in the "View/By file type..." dialogue.

A. And above that?

Q. Yes, Directories, Programs, Documents and Other files are all ticked.

A. And above that?

*Q. Aha! I think I see the problem: some bounder has set the "Name" box to *.txt.*

A. Which is why you only see .TXT files.

*Q. Indeed. Back it goes to *.* and all my files are back. Hurrah!*

Over the rainbow — the standard DOS colours

0	Black
1	Dark blue
2	Dark green
3	Dark cyan
4	Dark red
5	Dark magenta
6	Brown
7	Light grey
8	Dark grey
9	Light blue
10	Light green
11	Light cyan
12	Light red
13	Light magenta
14	Yellow
15	White

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NEW!

Console yourself

A GUI is great for lots of jobs, but Dale Strickland-Clark suggests that a console window might make you more productive.

Welcome to the first Hands On Windows NT column. Over the coming months I'm going to tease and provoke this operating system into giving up some of its secrets. Armed with a copy of the monstrously-proportioned Windows NT Resource Kit, a stack of MSDN CDs, a web browser and a snorkel, I'm going to wade into the murky depths of NT and pull out anything that vaguely resembles buried treasure.

As a keen advocate of getting the most done with the least effort, I abandoned Program Manager long ago as it was too much hard work, switching to a console window and a bunch of DOSKEY macros to launch most applications. A console window, sized to 13 lines by 50 columns, is enough to enter most commands, but I keep a second, larger window minimised for longer-running commands and anything that needs more room.

These, along with a short macro called "/" to launch commands in a new window (see the DOSKEY Macros panel) have served me pretty well up to NT4, and I haven't seen much need to change since. In fact, the extended command syntax introduced in NT4 has led me to try and put more and more complex commands on DOSKEY macros.

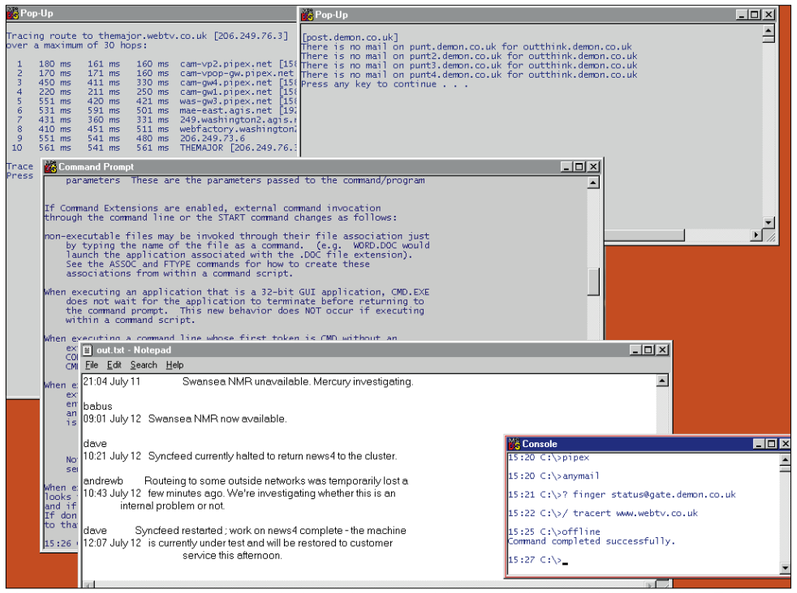
Firstly, let's just clear up one common misunderstanding from which I suffered for too long. The console window is not running a DOS environment. Yes, I know Microsoft chose an icon for the command prompt that screams MSDOS at you. However, that was just to make people feel comfortable that good old, understandable MSDOS was just a double-click away. Frankly, I would have thought that this was more likely to induce panic, but what do I know?

It's only when you attempt to run a DOS program that a virtual machine is created to simulate the old DOS environment. It's at this point that the system runs the AUTOEXEC.NT batch file found lurking in the \SYSTEM32 sub-directory, off the system root. You can add commands to this file to further prepare the virtual machine for your DOS applications, but unless one of these commands issues messages, you probably won't even know that it's running.

Curiously, the MEM command is one of the few real DOS commands shipped with NT. If you type "MEM /C" at the command prompt, NT will create a virtual machine, run AUTOEXEC.NT which loads a few device drivers, and then run the MEM command. This lists the device drivers just loaded and not much else, and then terminates. The virtual machine is then removed, along with all the device drivers just loaded. What's the point of that?

We'll have a look at the DOS environment in a future issue, but meanwhile, back to the console window. The need to keep the mini console window free for entering more commands means that many of the macros use a START command to open a new window. This introduces its own little complication, because the new window vanishes without so much as a puff of smoke as soon as the command has finished. This is thanks to a remarkable bit of inconsistency where DOS windows in Windows 3.1 and Windows 95 have the option of remaining open once the command has terminated. But Windows NT offers no such sophistication. To overcome this shortcoming, I've got into the habit of adding a PAUSE to the end of most commands that run in a separate window.

Although NT's console language is virtually indistinguishable from that of DOS, it does have a number of useful additions and the list has grown rapidly with NT4. Ignoring the new NT4 stuff for now, the principal extensions are "&" (an ampersand) to separate two commands on the same line, "&&" to separate two commands and execute the second only if the first was successful, and "||" (two vertical bars) to



My essential console window sits in the low right corner of the screen, just out of the way of the Taskbar, and never moves. The other windows pop up and vanish on demand. If I'm expecting a lot of output from a command, I just stick a "/" or a "?" on the front of it and the output appears in another window

DOSKEY Macros

Here's a selection from my much larger list of DOSKEY macros. Most of these work on either NT 3.51 or 4.0 but there are a few that use NT 4.0 features. Some of these macros simply launch applications, such as "word". They use the "START" command to prevent the console window from waiting until the application finishes before returning to the prompt. With NT4 this isn't necessary, because the "START" command is implied when launching applications.

```
/=start "Pop-Up" cmd /c cmdinit.bat ^& $* ^& pause
?=start /min cmd /c cmdinit.bat ^& $* ^>c:\temp\out.txt ^& start
       notepad c:\temp\out.txt\=start $*
+=start "Pop-Up" cmd /c cmdinit.bat ^& $* ^| more /e ^& pause
acc2=start C:\KITS\MSOFF42\ACCESS\MSACCESS.EXE $*
acc7=start C:\kits\MSOffice\Access\MSACCESS.EXE $*
agent=start /ds:\internet\agent i:\comms\agent\agent.exe $1.ini
ameol=start /max /ds:\ameol I:\COMMS\AMEOL32\AMEOL32.EXE $*
anymail=start "Pop-Up" cmd /c finger outthink@post.demon.co.uk ^&
       pause
BulkRename=for %i in ($1) do rename %i $2%i
cixip=start "Msgs" cmd /c rasdial "cix ip" ^&^& start rasmon
convertmacs=for /f "tokens=1,* delims==" %i in ('doskey /macros ^|
       findstr "[&|]"') do @echo >batch\conv\%i.bat @%j
cw=start "Console" cmd /k cmdinit.bat
editmacs=Start notepad c:\batch\macros.txt
ex=explorer $*
exr=explorer /e,/root,$*
ext=explorer /e,$*
history=doskey >c:\temp\history.txt /history && start notepad
       c:\temp\history.txt
job=explorer "s:\jobs\$*" && if exist "s:\jobs\$*\tools" explorer
       "s:\jobs\$*\tools" & if exist "s:\jobs\$*\startup" for %i in
       ("s:\jobs\$*\startup\*.*") do %i
loadmacs=doskey /macrofile=c:\batch\macros.txt
offline=rasdial /disconnect && sleep 1 && kill >nul rasmon
qmac=doskey /macros | find "$*"
qmacs=doskey /macros
resume=dir s:\ameol\data\resume\$1.rsm | find /i "$*" & start notepad
       s:\ameol\data\resume\$1.rsm
savemacs=doskey /macros | sort >c:\batch\macros.txt
space=for /f "tokens=1-3" %i in ('dir /d c:\ d:\ \\server1\drive-c
\\server1\drive-d \\server1\drive-e ^| find "bytes free"') do @echo %i
       %j %j
word=start /max C:\kits\MSOffice\Winword\WINWORD.EXE $*
```

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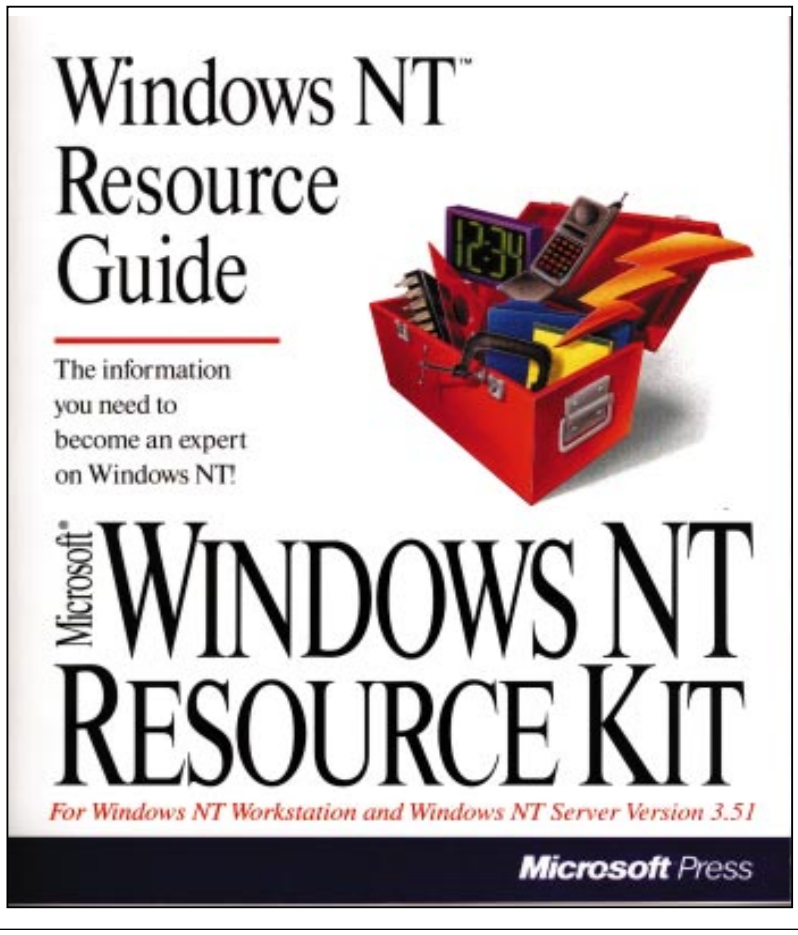
Windows NT Resource Kit (3.51)

I've been fortunate enough to get my hands on one of these magnificent works which comprise five stout volumes and a CD-ROM brimming with goodies. The books cover networking, optimisation, messages, the Registry and a whole lot more, and occupy over six inches of shelf-space between them.

- Volume 1. Deals with the NT architecture and is essential reading for anyone who wants to achieve a sound understanding of what makes NT tick. It also includes a description of each file shipped with NT and an explanation of many of the values stored in the Registry. The knowledge junkie will be able to open this book on just about any page and be instantly absorbed.
- Volume 2. Crammed with networking information. Identifies the purpose of the networking options that most mortals dare not touch. Its detailed coverage of the RAS SWITCH.INF file to automate logon processing should make the essential connection to your ISP a quicker operation.
- Volume 3. A book full of system messages is of dubious value when the accompanying explanation offers little more advice than the original message, but Volume 3 is full of them anyway. There is some help here, yet this volume will still look new long after the other four are ragged from use.
- Volume 4. If you want to strangle every ounce of throughput from your gasping system, you'll want to be propped up in front of this into the wee small hours. It covers optimisation, and shows how to use the System Monitor to measure performance and identify bottlenecks.
- Volume 5. A supplement containing additions to the first four volumes.

One or two items from the CD-ROM can be found on the internet but it is, nevertheless, a valuable collection of utilities and general goodies that no serious NT shop should be without. I will be looking in detail at some of this stuff in future months.

See PCW Contacts *for details of Resource Kit version 3.51.*



separate two commands with the second, only executing if the first failed.

This is clear enough until you begin stringing long lists of commands together. Consider the following:

```
cd nosuchdir && type missing.txt ||
echo Can't find directory
```

If the CD command is successful, the file is typed, otherwise the ECHO prints a message. This works as required but perhaps not as expected. Given that the ECHO follows the TYPE command, shouldn't the message be "Can't find file"? In fact, the ECHO executes if either the CD or the TYPE command fails.

It turns out that the real behaviour of "&&" and "||" are linked to the current errorlevel (usually set to non-zero by failing commands), causing the next command to be executed or skipped depending on its value. However, commands that are skipped leave the errorlevel unchanged.

With a bit of imagination, it's possible to take advantage of this in some interesting ways. Here's an example where a string of commands employ a common error handler:

```
cmd1 && cmd2 && cmd3 && cmd4 ||
echo oh goodness me
```

If any command fails, the remaining are skipped and the ECHO is executed.

More specific error-handling demands the use of a further addition to the original DOS syntax; namely, the use of parentheses to group commands. This example provides specific error messages:

```
cd nosuchdir && (type missing.txt
|| echo Can't file file) || echo
Can't find directory
```

It appears that the errorlevel is saved on entering a command group and restored again on exit.

With this groundwork in place, it is possible to string some quite complex command sequences together on a single line or in a single DOSKEY macro. The list of macros shown ranges from simple shorthand to some pretty complex loops that depend on features introduced in NT4, with which I will deal next month.

•PCW Contacts

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Computer Manuals 0121 706 6000; http://www.compman.co.uk for Microsoft Windows NT Resource Kit version 3.51 (ISBN: 1556159269). £187.99 (incl. VAT)

NEW!

Under **construction**

This column replaces “32-Bit” and is our eye on Unix. Chris Bidmead is still in the chair, and keeping him company are ppp diagnostics, Dick Pick, and Dylan the Hippy Wabbit.

All web pages sporting roadworks signs saying they’re “Under Construction” make me laugh. They’re a testimony to the many people out there who still don’t get it. Do these people think that at some point their web-making is going to be “finished” and they can knock off? The web is, by its nature, always “Under Construction”. If it isn’t being re-thought and re-built on at least a monthly basis, what you’ve got isn’t a web page, it’s a tombstone. Likewise, columns like this. This has been called “32-bit Computing” for nearly three years, but under that loose umbrella has been ducking and weaving, looking for themes, developing them, chucking them and moving on.

OS/2 used to fall under this banner until we spun it off into a separate column. Now it’s the turn of Windows NT. I’m delighted that Microsoft’s operating system is going to have its own column from this month. When I started, Windows NT was a niche operating system of dubious reliability. Since then it has grown up into a serious contender, not just as a server, but also as a workstation operating system (arguably — well, I would argue — the only proper desktop operating system Microsoft has on offer). Yes, it’s still pretty memory-hungry for a general desktop system, but look what’s happened to the price of memory over those three years.

If Windows NT has been getting short shrift from me over recent months, it’s because the main theme, guided by feedback from your letters and emails, has been Unix and its variants. The new Windows NT column gives readers the chance to keep up in-depth with an operating system that I’m sure is going to make an important contribution to the computing mainstream. And to give us a better focus on the alternatives. The change doesn’t mean that I’ll be ripping Windows NT out of my own network forthwith. Like OS/2, it will continue to form part of the heterogeneous computing environment I’m nurturing here, and no doubt you’ll hear from me about it in that context from time to time.

Hacking pppd

The netstat utility makes a useful PPP diagnostic. You can evoke it with a number of parameters to look at different aspects of how your network is functioning. Netstat-i gives you something like Fig 1.

This lists the various network connections and how the packets are moving through them. We’re interested in the ppp0 connection and the input and output errors columns (Ierrs and Oerrs). But don’t make the mistake (as I did, before being corrected by wiser heads) of ignoring the total input and output traffic (Ipkts and Opkts) because the errors are only interesting in proportion to the total traffic. Netstat lists the whole network activity, including internal network connections on the same machine, so you might want to filter the output along the lines of Fig 2.

Grep is one of the great Unix workhorses, a filter that we use here to say “Just give me every line with the string ‘ppp0’ in it”. While we’re filtering, and just for fun, let’s look at a way of tightening the filter even further. We do this with a more flexible filter language called awk, which, as long-standing readers will know, is a particular favourite of mine. The equivalent in awk of the grep filter looks more complicated (Fig 3).

The benefits of awk emerge when we want to cut the netstat table column-wise and row-wise. In awk, each word (by default a string surrounded by spaces) is represented by the variable $n, where n is the number of the word reading left to right across the row. We’re interested in the packet traffic and the errors — the fifth, sixth, seventh and eighth words across the row. We can revise our awk inline program (Fig 4).

This gives us just four numbers, but we might have forgotten what they stand for.

Fig 1 netstat-i

```
nextmachine:1# netstat-i
Name  Mtu   Network    Address          Ipkts   Ierrs   Opkts  Oerrs  Coll
lo0   1536  loopback   localhost         9638       0    9638      0     0
en0   1500  192.168.1  nextmachine     643394       0  458918      0     0
en0*  1500  none       none            16571       0    1919      0     0
ppp0  576   158.152    cbidmead.myisp.29005      14   31342      0     0
ppp1* 1500  none       none                0       0       0      0     0
en0*  1500  none       none           676037       0  460834      2  1692
```

Fig 2 Filtering output

```
nextmachine:2# netstat -i | grep
ppp0ppp0  576   158.152   cbidmead.myisp.    29110     14   31461   0     0
```

Fig 3 awk equivalent of grep filter

```
nextmachine:4# netstat -i | awk ‘/ppp0/
{print}’ppp0  576   158.152   cbidmead.demon.   29368  14  31742   0  0
```

Fig 4 awk inline program, revised

```
nextmachine:11# netstat -i | awk ‘/ppp0/
{print $5 “\t” $6 “\t” $7 “\t” $8}’29740  14   32114  0
```

So, let’s include the headers. If you were doing this in BASIC, you’d probably want to write an extra line to PRINT out the titles as string constants, but awk is all about being quick and dirty. So let’s use the title strings that are already in the netstat table and tell awk to print any line that either contains “ppp0” OR the string ‘Name”. That OR is represented by the vertical bar character “|”, which happens to be the same symbol we use outside awk to mean “pipe” (as in “send the output from utility a into the input of utility b”). Fig 5 shows what we get.

These alternative uses of “|” can be confusing, and this kind of complexity is one of the many perceived barriers to entry for would-be UNIX users. Let me turn this around and call it one of the life lessons that UNIX can teach you. The vertical bar character is a symbol, and symbols by definition are only given meaning by their context. Smile at a stranger in Newcastle and the chances are you’ll get a smile back. You’re saying, “Hello, isn’t it a nice day?” Do the same thing in London and you’ll almost certainly get a sour look, if you get anything at all. Part of the versatility and depth of Unix comes from the fact that nobody has tried to cram all the things an operating system can do into a single context.

This brings me to an argument from one of my readers. Dylan the Hippy Wabbit <spacey@icrf.icnet.uk> (sigh...!) seems to be a Macintosh fan, and writes: “Sometimes I get the impression that you’ve been using command line systems so long that you’ve forgotten that it ever hurt. Rather like a guy I used to work with. He was so badly damaged by MS-DROS that he couldn’t see what was unintuitive about edlin.”

I told the Hippy Wabbit that the problem with not having a command line is that you then leave it to the designer of the GUI to second guess everything you’re going to want or need to do with the system. My current experience with Linux and NeXTStep has convinced me that the last thing I want to yield up to some interface designer is my command line. NeXT and, indeed, any Unix + X gives me the benefit of both worlds without compromise.

And the Mac is a historic example, IMHO, of why it’s a bad idea to deprive users of choices. Remember that Steve Jobs didn’t just steal the command line from Mac users. He took away cursor keys, a mouse button and expansion slots. And he took the object-orientatedness out of the Xerox GUI too. History has shown him wrong about all this, and thank heavens he acknowledged it with the design of NeXT. The world, and, if I may humbly suggest, Dylan the Hippy Wabbit, would do well to learn from this.

Fig 5 Including headers

```
nextmachine:13# netstat -i | awk ‘/ppp0|Name/
  {print $5 “\t” $6 “\t” $7 “\t” $8}’
Ipkts  Ierrs  Opkts   Oerrs
31443  14     33908   0
```

Multiple booting

I’ve had a number of mailings from readers complaining about operating systems messing with the master boot record so that multiple boot installations (which Linux’s lilo is supposed to enable) don’t work any more. The chief offender is Windows 95, which writes its own master boot record as though there is no other operating system in the world. In the past, my advice has been to install Windows 95 first (then perhaps run a utility like Norton to save the master boot record just in case) and then install Linux, putting lilo on the MBR.

An alternative I’ve been using with some success is the Boot Manager that comes with IBM’s OS/2. Obviously this is proprietory code, and you’ll need a copy of

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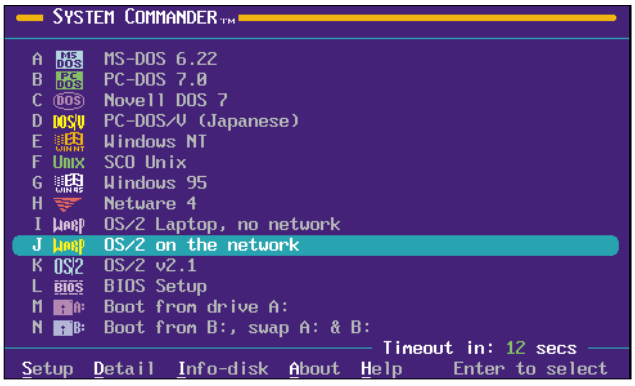
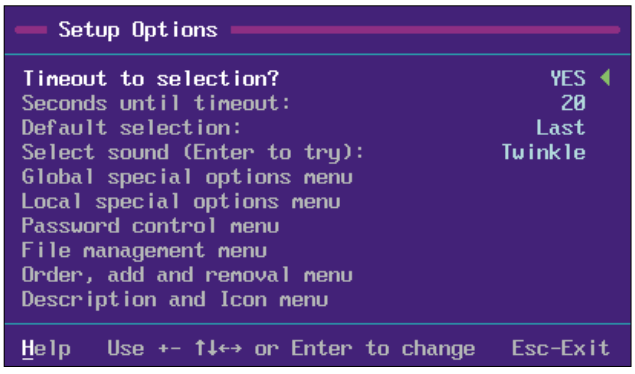
OS/2. You don't, however, need to install OS/2 onto your hard disk; it's enough to have an OS/2 boot disk to install and set up the Boot Manager.

Another approach turned up in my postbag the other day. "System Commander" is a very flexible commercial boot manager that claims to be able to deal with a huge list of operating systems – as far as I can make out, pretty well every operating system that has ever run on an Intel box, including defunct ones like Coherent, exotic ones like QNX (a fascinating microkernel-based real-time network operating system I keep promising myself to install some day) and even Pick.



System Commander automatically detects your installed operating systems and comes up with a menu like this, which you can subsequently edit



System Commander's setup menu. As well as useful features like being able to password protect individual operating systems, you can also characterise different operating system boots with different sounds

A Pick diversion

I'd love to hear from any readers who are using Pick. It might encourage me to take another look at what I remember as being a clever and flexible operating system that was built on a special kind of database that the inventor called "co-relational". He was the legendary Richard A Pick. Everyone called him Dick Pick, of course, a punchy name that suited him to a tee. He died in 1994, and... well, I remember him so vividly from a night some time in the mid-eighties we spent in a Japanese restaurant.

He was very — I was going to write "witty", but a better word is "funny". He loved to laugh, he was erudite, and he hated IBM with a passion. In fact, the whole "co-relational" database thing was inspired by his hatred of what he saw as the orthogonal, regimented ethos of Big Blue. He believed (wrongly, I think) that IBM's concept of the relational database was shaped by the experience of punched cards, which was why it stored all its data in inflexible flat tables. His own astonishing database system was designed to accommodate real business data in whatever shape it arrives. It's based on the flat file, but the various records in that file can be different shapes and sizes, with whatever fields are appropriate for that particular record. And individual fields in those records can have as many separate pieces of data in them as you need.

I think Dick Pick misunderstood Codd's concept of the relational database, but there's no denying that a real pearl grew around the irritant that IBM produced in his soul. Pick, the operating system, was delivering solutions for businesses at a time when other operating systems on mainframes and minis were choking on their own promises. In the mid-eighties I ran Pick on an IBM AT, and was persuaded that all operating systems would one day discover that the database ought to be underneath the file system, which is where Pick put it. My copy of the manual is signed by Dick Pick himself, and I treasure it. There are some touching tributes to him on

`http://www.picksys.com/links/pub/info/pickworld/95jan07.html`

Back to System Commander

But I was telling you about System Commander. The only limitation I can see is that it requires a DOS-style FAT partition somewhere on the hard drive, but if you're running DOS, Windows 95, OS/2 or Windows NT, you will or may well have this anyway. Like Windows 95, System Commander writes its own MBR, but not before it has analysed your existing MBR to find out what operating systems you are using. It installs using this information, but not before it has backed up your own MBR. It keeps a copy of its own MBR on the FAT partition so you can reinstall it if necessary.

The manual deals with partitioning and booting, and is full of good advice and hard-to-find information.

Get System Commander from POW! 01202 716726, or email dpower@powdist.co.uk<dpowera@cix.compulink.co.uk>. There's a web page at http://www.powdist.co.uk/.

There's a new operating system using a tightly integrated database and file system. "Be" comes with its own dual-processor hardware from a company set up by Jean-Louis Gassee, an Apple refugee. I'll cover this more in the future. Here's a screenshot from the company's web page at http://www.be.com

PCW Contacts

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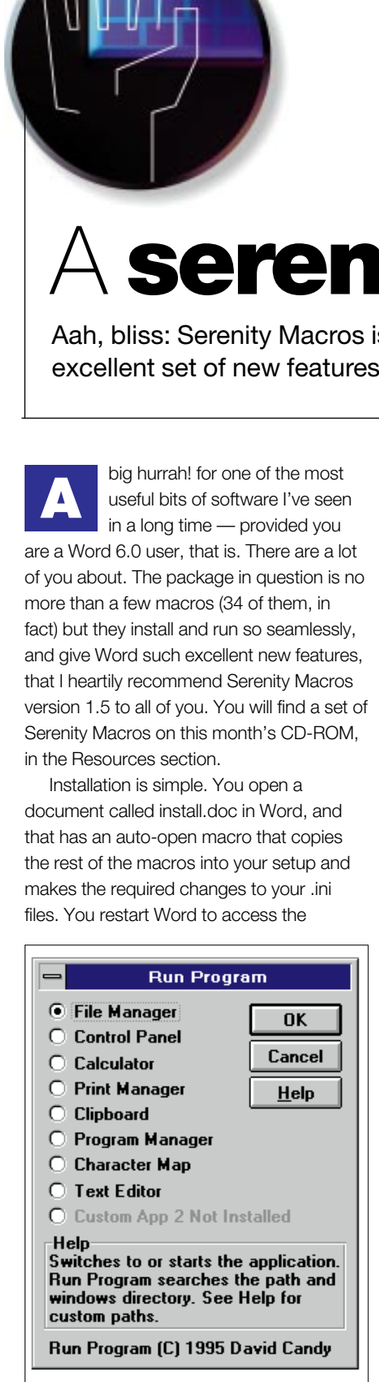
A **serene** scene

Aah, bliss: Serenity Macros is a collection of 34, er, macros which give Word 6.0 an excellent set of new features. Tim Phillips shares some of the best with you.

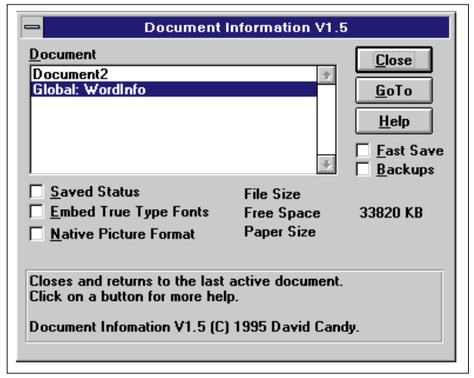
A big hurrah! for one of the most useful bits of software I've seen in a long time — provided you are a Word 6.0 user, that is. There are a lot of you about. The package in question is no more than a few macros (34 of them, in fact) but they install and run so seamlessly, and give Word such excellent new features, that I heartily recommend Serenity Macros version 1.5 to all of you. You will find a set of Serenity Macros on this month's CD-ROM, in the Resources section.

Installation is simple. You open a document called install.doc in Word, and that has an auto-open macro that copies the rest of the macros into your setup and makes the required changes to your .ini files. You restart Word to access the Serenity macros, some of which appear on the toolbar, and some of which can be found lurking on your menu tree. This sounds a bit hair-raising, but it's not as bad as it sounds. Because the basic template, normal.dot, is not changed, removing the Serenity macros is simplicity itself. You just move or delete the base files.

At this point, I must counsel that the software is hard-coded for WinWord 6.0. This means that if you have Office 95 it won't work, although I'm nagging the author for an update. With WinWord 7.0 you get most of the macros, but because the changes to the .ini file aren't completed (it has a different name), you also get a sprinkling of WordBasic errors. This can be hard to change, and I'll give a book token to the reader who suggests the best fix (or writes one as a macro).



Another Serenity macro: this one opens one of the windows applets; you choose which one. It doesn't do anything you can't do already but it is quick and easy, especially if you are running in 640 x 480 resolution



The document info macro from Serenity — all the information on all your open documents. It helps me to keep track when I have several similar files

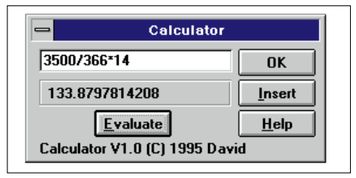
There are a number of thoroughly recommended new features, not all of which I can cover in this column for reasons of space, but I've picked out a few of the best to show what I mean.

■ Save Selection as: highlight some text, then click on this and it will save the highlighted text as a new file. It shouldn't be hard without this macro, but it is.

■ Save As Graphic: whatever the selection is, this will save it as if it were a .WMF file.

■ Run Program: a shortcut to call up the windows applets like the calculator, the symbols dialogue box and so on. It's not customisable, but there's a lot there already.

■ Serenity expand: here's an interesting function which some people love and many hate. It guesses the word you are writing depending on previous words in that document. Some typists, especially bad ones, find this an incredible time saver. Others find it just plain annoying. For once, I'm going to sit on the fence. I like it for a short time but could not write long features with the function enabled.



A macro from the Serenity Macros. The simple calculator pastes the result of the calculation into your document

Problem solver

Lots more Word stuff this month as Microsoft continues to tax your minds.

■ Kay Cullen, of Doncaster, wants to know whether she could read her husband's Word 6.0 files on her home PC, which is equipped with Word 2.0: "*There are no fancy features in the files*," she says, "*so I feel I should be able to at least read the text. After all, I can read WordPerfect files, so it's only right that I should be able to read Word, too.*"

This is a common problem, because when Word 2.0 comes out, it doesn't know what a Word 6.0 file is going to look like, so it doesn't recognise it when it finds it. However, Microsoft tells me that there is a converter to read Word 6.0 files in version 2.0. This will also read word 7.0 files, and Word 6.0 for the Mac, so even if your husband's work upgrades to Office 95, it will still work fine.

I wish I could just post a macro to do it, but you have to get in touch with Microsoft (0345 002000) and ask for the Word 6.x -7.0 Converter Kit for Word 2.0. You can also find this converter kit on CompuServe, in the Microsoft Software library. It is called MSWRD6.EXE.

Alternatively, if you have a copy of Word 6.0, it will already have the converter. In fact, if you have 6.0, you don't need the converter in the first place, but Microsoft's like that. The directions for copying this file to Word 2.0 so that it will do the conversion run as follows:

1. Quit Microsoft Word 2.0 if it is running.
2. Copy the file MSWORD6.CNV from the \MSAPPS\TEXTCONV sub-directory in your Windows directory, to the Word 2.0 for Windows program directory. If this file is not available, run Word 6.0 for Windows Setup again to install the convertor and repeat step 1.
3. Restart Word 2.0 and open a Word 6.0 for Windows document that has a .DOC file extension. The convertor should now be properly installed.

■ David Holloway emailed me from oop north to ask about placing a "watermark" (that is, a repeated greyed image) in a document. I can't do it for WordPerfect, which is what he wanted (perhaps one of you can help here?) but on CompuServe I found this message from someone called Dina, who knows about Watermarks in Word:

1. Choose Header And Footer from the View menu.
2. From the View menu, choose Toolbars and select Drawing to display the Drawing Toolbar.
3. Click the Textbox icon on the Drawing Toolbar (it looks like a box with lines in it; sixth button). Drag your mouse (click and hold down the button and then move the mouse) in the header to insert a text box.
4. With your cursor inside the text box, choose Insert/Picture and insert your picture.
5. To move the Textbox, click on it until the black handles appear around the edges. Position the mouse over the border until you see a cross icon. Click and drag it to its new location. If you need an exact position on the page, choose Format/Drawing Object and choose the Size and Position tab.
6. To resize the Textbox, click it and drag a sizing handle (one of the black boxes around the edge) or choose Format/Drawing Object/Size and Position.
7. With the picture still selected, click the Send Behind Text button on the Drawing Toolbar (it looks like a blue circle with text in front of it). This is what will allow the text of your document to print over it.
8. Choose Close on the Header And Footer toolbar.

■ *Now, I'd like a Watermark macro for every word processor format. Prizes for the best efforts.*

■ Stay on Top: keeps Microsoft Word on top of the pile of applications when this menu item is enabled. You can tell that it is, because there's a tick next to it on the menu.

■ Document Info: displays a dialogue box with all the open files and document info about them. Like most of the dialogue boxes in Serenity, it is nicely presented and compact.

■ Calculator: a simple evaluator that will work out your sum and paste the result into your document.

The software is written by David Candy, who is at the University of Sydney in Australia. If you want to register this

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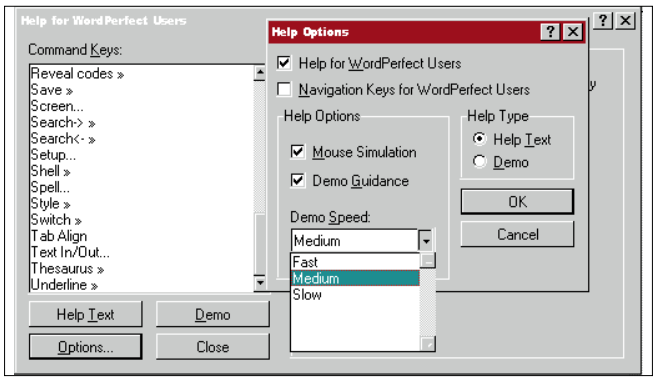
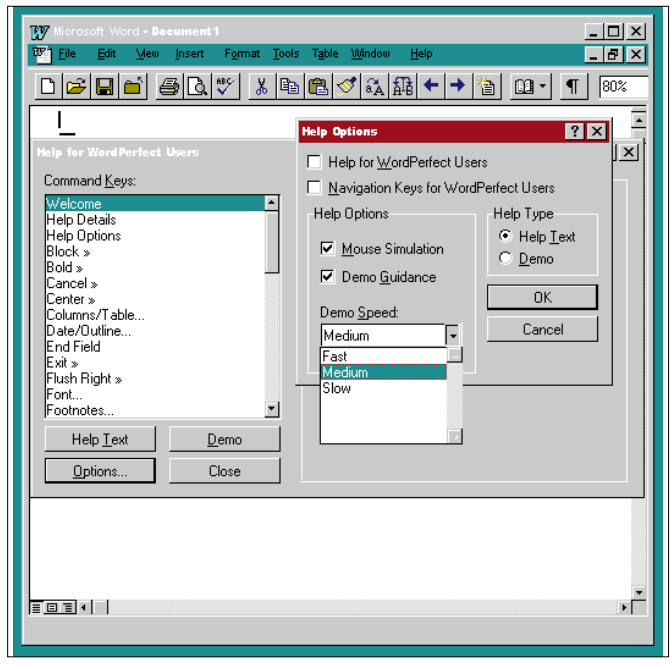


WordPerfect help is provided in Word for users who are switching from one to the other



The WordPerfect Help in Word. It's comprehensive, although it will send you to sleep if you're not careful

program (remember it is shareware, not freeware) it costs A$15, which shouldn't break the bank. Roll on a new set of macros that I can use under Windows 95.

Switchkits

I've never been convinced that these work well, because I prefer to learn from scratch rather than to rely on how one thing works relative to how another works. New this month, though, Lotus is offering a switchkit for defecting WordPerfect users who have decided to change to WordPro.

It's available from Lotus, free, if you have bought a copy of WordPro, unless you are running under OS/2 because then you have to wait until the kit is finished. It's a good bit of software though. Unlike Word's WordPerfect switchkit which is confusing and not very exciting, visually this allows you to use natural language to ask real questions, such as "How do I…?"

If you are a function key user, you type in the WordPerfect function key and WordPro tells you how to do the same thing in the Lotus Universe.

If you are a WordPerfect user switching to Word, the WordPerfect help you will receive is less detailed but covers all the bases in its own way. It is more useful as an emergency help to get you out of a tight corner than a structured course in Word, and the Lotus version has the edge in that department. Of course, it's folly to choose your word processor just because of the switchkit — go on a training course instead. It'll cost twice as much as the software but it'll be worth it.

PCW Contacts

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CompuServe 104047,2750
or **wong@cix.compulink.co.uk**

Tips & Tricks

Here's how to change the default filename in Word for Windows 6.0 from *.doc, to *.*

It's quite easy and if, like me, you are using a large number of different files, it can save a lot of time. The trick is to edit the FileOpen command like so:

```
Sub MAIN
Dim dlg As FileOpen
GetCurValues dlg
dlg.AddToMru = 1
dlg.Name = "*.*"
n = Dialog(dlg)
If n = - 1 And InStr(dlg.Name,
"*") = 0 Then FileOpen dlg
End Sub
```

To edit FileOpen, choose Tools, Macro. Type FileOpen and click the Create button. Edit the macro to appear as above and then close the macro window. Choose to save changes to the FileOpen macro when prompted.

Finally, to record the change in your Normal template, choose Save All from the File menu and if prompted choose Yes to save changes to the NORMAL.DOT file. Choose File, Open or click the Open button, the FileOpen macro runs and *.* appears in the File Name edit box.

■ There has been some discussion about how to avoid macro viruses by simply opening Word without loading a document, or loading a document without its auto-run macros. They are all good ideas which don't really seem to work well enough, but it does highlight a few switch options available when starting up your Word installation. I always load Word without a blank document because I'm usually just adding to a document I already started.

Here are a few extra command lines:

• To start Word without opening a document	winword.exe /n
• To start Word with a specific document open	winword.exe <filename>
• To start more than one document	winword.exe <filename1> <filename2>
• To start Word and automatically run a macro	winword.exe /m<macroname> (*Note: there is no space after /m and before the name of the macro*)
• To start Word without any templates or add-ins	winword.exe /a
• To start Word and start the Quick Preview demo	winword.exe /mHelpQuickPreview
• To start Word without a "Tip of the Day"	winword.exe /w

Two **web** feats

Look what the web has turned up — another add-in, Internet Assistant Wizard, which converts Excel worksheets into web pages. Stephen Wells strides out.

I mentioned four add-ins last month which are compatible with Excel 5 and 7, and which you can download with a mouse-click from `www.microsoft.com/msexcel/fs_xl.htm`

I concentrated on the Lookup Wizard, recounted my dilemma with it, and gave the formula that you can use instead.

Another of the four add-ins is the Internet Assistant Wizard which converts an Excel worksheet into a web page. I'll tell you how it's supposed to work, the problems I had, and give you an alternative solution.

There was a time when people just used their copper line connection to the world for a telephone. A postal strike some years ago spurted the growth of home fax machines. Then came the eagerness for email. Now it seems that everybody is preparing their own web page.

You might ask why anyone in this country would display a photo of their caravan for sale, or news of their hiking club, to people in Pakistan, Poland and Peru? But that's what media types would call "throw-away circulation". With services like CompuServe's Our World, it can be so inexpensive to have a personal web page that it doesn't matter that you reach millions of extra people who don't share your interests.

The Our World Home Page Project is included in CompuServe membership although you are limited to 1Mb of disk space when uploading your web pages, but there is no additional cost involved to publish and maintain them. Additional space can be leased.

The basic language of the web is HTML (HyperText Markup Language) and if you have the patience, there is no reason why you shouldn't use it if you want to. You can precede a line of text with and end it with and it appears in bold. The slash mark signifies the end of any formatting, so and start and end an italicised word or phrase.

Just as Windows started as a shell over DOS, rather than the programming language it is today, so HTML editors now make it possible to create a web page without writing any of this code. The old battles are being fought again. The experienced web page designers say the editors are for newbies, while the latest editors permit special effects which are hard to create from scratch in standard code.

The Internet Assistant Wizard for Excel is installed just like any other add-in. This one downloads to the desktop. Then you just choose Tools, Add-Ins, Browse and select this new .XLA file. After that, the name Internet Assistant Wizard appears at the bottom of the Tools menu.

My worksheet (Fig 1) shows a menu for a fictional café. There is an embedded Word Picture logo then several headings and entrées, formatted in various sizes and colours. No worksheet gridlines or row and column headings are displayed. To use the Wizard, you select the required range of your worksheet then start the new add-in. It has five steps.

Step One simply confirms the selected range and gives you the opportunity to change it. Step Two offers you the choice of creating a complete web page or copying just a table into an existing HTML template.

If the first option is taken, Step Three will ask you to enter header and footer information such as a title and description text, the update date, your name and email address (if you want them on the page). If the second option is taken in Step Two, enter the path and filename of the template you wish to amend with the new data. Step Four lets you convert the table with or without formatting. Step Five is for entering the name of the new file to save to.

The first thing I found was that the Wizard ignored my graphic — maybe it's only meant to be used for text? The bigger problem was that the web page had visible web page cells in odd-sized columns and the Wizard stacked the main heading in three rows. While Excel will run a heading into adjacent blank cells, this Wizard doesn't appear to.

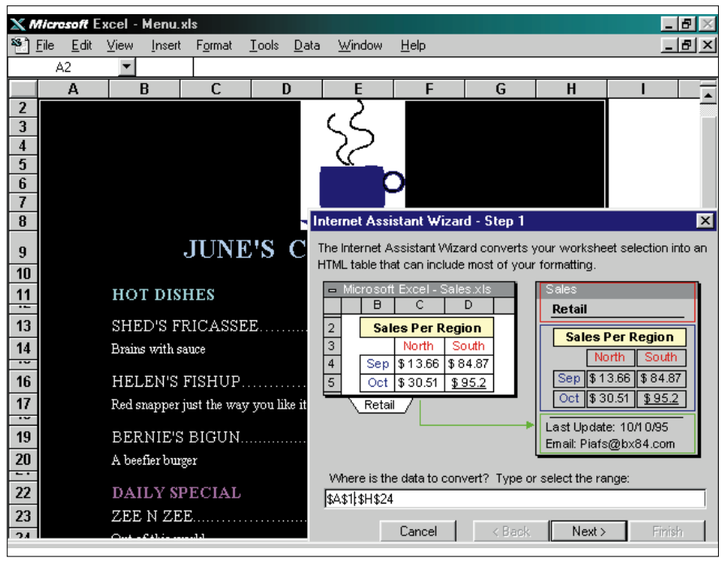

Fig 1 The Internet Assistant Wizard is intended to translate an Excel worksheet into an HTML document

The kindest thing to say is that the Wizard is insufficiently intuitive and can only cope with simpler worksheets than the one I used. Or that it takes more training time than I allowed for. It may be unfair to compare this simple little Wizard with a serious piece of kit, but then I tried the Microsoft FrontPage Editor. At the time of writing, a free trial copy was also downloadable. Well, free after the hour of download time, that is.

FrontPage really is intuitive. I didn't read any of its help files or anything else of an instructional nature. I just minimised my Excel worksheet and FrontPage onto the Windows 95 Taskbar and switched between them.

I successfully transferred everything on the worksheet by copying and pasting (Fig 2). The graphic was no problem. FrontPage recognises all the most common graphic file types and converts them to 8-bit GIF (Graphic Image File) or 24-bit JPEG (Joint Photographic Experts Group), which are the formats acceptable for servers and browsers at present.

I could rave on about FrontPage for the rest of this column, but I must get into my second web subject this month.

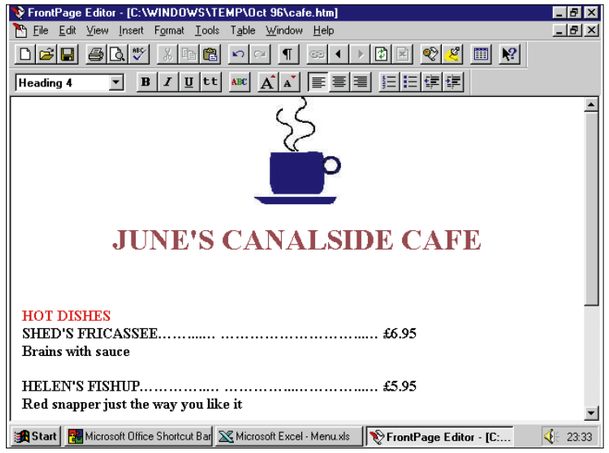

Fig 2. FrontPage Editor works better. You can copy and paste anything from Excel into it and create an instant web page

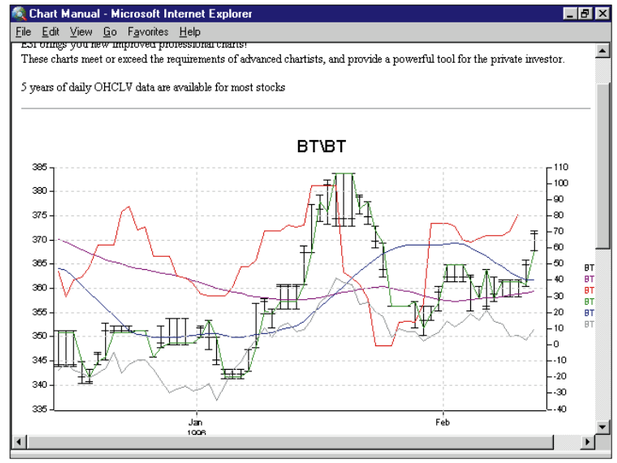

Fig 3 You don't even need a spreadsheet to create this chart. Just download it from ESI's investors' service

Fair shares

Several readers have asked me about downloading stock price information into spreadsheets. Spreadsheets are the primary software tool for recording results of personal portfolios and can help with one aspect of stock analysis. Although many traders lean towards fundamental research, like new products, management, or acquisitions when evaluating companies, others put great store in technical data. This depends on the availability of historical pricing and sales volumes as well as access to realtime stockmarket prices.

One of the first companies to offer this information, plus individual trading in UK shares through an authorised broker over the internet, is Electronic Share Information (ESI). Its URL is

`http://www.esi.co.uk`

I have found Debbie Reay (in ESI's technical support department) to be most efficient and genuinely helpful, responding to emails with alacrity. After registering, which is free for some basic services and inexpensive for others, you can download data in a choice of formats, including CSV, and then load this straight into an Excel worksheet. You can see a lot of information already in chart form (Fig 3), and this can save a lot of time.

For unit and investment trust information, as well as PEPs and offshore funds, try the Interactive Investor at

`http://www.iii.co.uk`

For no charge, you can view its Micropal fund league tables which show the top performing funds over one, three and five years.

If you are interested in currency information, the ECU Group is at

`http//www.bogo.co.uk/ecu/ecu/8charts.htm`

ECU offers data on short term interest rates, the bond markets and global stock market prices from Investment Data Service. The data is not currently importable to a spreadsheet but the pages are worth viewing because they are so beautifully designed.

A prime source for fundamental information is the *Financial Times*. Following (free) registration, you can look at that paper's main daily business news stories at

`http://www.ft.com`

A comprehensive personal finance site is MoneyWeb, run by Ian Dickson at

`http://www.demon.co.uk/moneyweb`

Ian also takes the time to answer individual questions on his specialist subject — you meet the nicest people on the internet!

I'd like to hear from more readers about their experiences of downloading information of any kind into spreadsheets, and also about using spreadsheets to help with investments.

It's a mystery

A reader says he saves his Excel workbook

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files to his hard disk during the day, then, come the hush of eventide, he tries to save to a floppy and there is no sign of yesterday's version of the files. If he saves the files anyway, and later, with Explorer, looks at the files, he finds they have been updated properly.

A little investigation reveals that, out of habit from using earlier versions, he calls his files NAME.XLW. There was a time when worksheet files used the .XLS extension and workbooks were .XLW. These days there are only two workbook types, the .XLS and .XLA (a fully-compiled add-in). You can call a normal workbook whatever you like and Excel will save it and load it in that name, but it treats it as it would an .XLS file. A worksheet file is now a workbook with one sheet in it.

If you choose File, Save As, the default type is "Microsoft Excel Workbook [*.XLS]." Any file called NAME.XLW in the selected directory or disk doesn't appear in the Name column above. But you can save your file with that name.

I suggested to this reader that either he uses the .XLS extension or none at all, from now on.

Calculated criteria

Shane Devenshire, of California, has been kind enough to send me another stack of helpful spreadsheet hints, so I'll pass on a couple here. The first is a group of formulas which you can apply when using Excel as a database.

Excel's criteria ranges are not case sensitive. If your criteria cell contains Melissa, it would report melissa, Mellssa or Melissa Jane as true when it should return false. If your criteria cell is B2. the following calculated criteria will solve the problem:

```
=EXACT(B2,"Melissa")
```

If you want to check that your criteria cell entry begins with a capital letter use:

```
=AND(CODE(LEFT(B2,1))>64,CODE(LEFT(B2,1))<91)
```

That formula checks to see whether all the characters are in the ASCII code range 65 to 90, which represent the capital letters A to Z.

Similarly, the following formula will see if the first letter is lower case.

```
=AND(CODE(LEFT(B2,1))>96,CODE(LEFT(B2,1))<123)
```

If you want to see if it's true or false that the first letter in your criteria cell agrees with the same letter in another cell, you could use the following formula:

```
=EXACT(LEFT(B2,1),$B$3)
```

The initial letter to check for is in cell B3.

You could even check to see whether a name has a capital P as the third letter, as in McPherson. Put a P in cell B3 and this is the formula:

```
=EXACT(MID(B2,3,1),$B$3)
```

New sheets

The basic way to add a new worksheet in Excel is to choose Insert, Worksheet. You can also right-click a sheet tab and be offered the same choice.

Shane reminds us that you can also press Shift+F11 or add the Insert Worksheet button to one of your toolbars. Each of these methods only adds one worksheet, so he has written a VBA sub-routine which displays an Input Box so that you can create a dozen or more in one go.

Just choose Input, Macro, Module and then enter the listing below. It will automatically be added to the Tools, Macro menu. From there you can choose Options and then specify a shortcut key if you wish. The error message runs if you press Cancel in the Input Box instead of OK.

Personally, I use a couple of other methods. Say you have six sheets. Hold down Shift and then click the far left and right sheet tabs. Then right-click, choose Insert, and six new sheets will be added.

My other method of doing this, if I know that I want to have a lot of worksheets when I start a new workbook, is to choose Tools, Options, General Sheets in New Workbook, then twiddle the arrows to the number I want. As every sheet adds memory, the normal default I maintain here is one worksheet.

```
Sub NewSheets()
  On Error GoTo ErrorMessage
  Answer = InputBox("How many sheets do you want?")
  If Answer = "" Then Exit Sub
  ActiveWorkbook.Sheets.Add Count:=Answer
  Exit Sub
  ErrorMessage: MsgBox "You must enter a number"
End Sub
```

EXCELlent shortcuts and longshots

What's happening?

With Excel 7, choose Help, About Microsoft Excel, System Info.

This opens a special file, MS System Info Version 2.0, which tells you everything you could wish to know about your system right now, including physical and disk memory available, swap-file size, and your temporary directory.

Other categories give the details of available printers and their drivers; system DLLs (dynamic link libraries); available fonts; dictionaries; graphic filter settings (which applications are associated with every file extension); text converters (associated extensions again); and lists all applications running.

Copycat

Any changes made to Page Setup for one worksheet in a workbook can easily be applied to another. It might be the margins, headers, or orientation (portrait versus landscape).

Select the settings you want on one sheet, click the tab of another sheet and press F4. You can make the same changes to several worksheets by holding down the Ctrl key as you click on the appropriate worksheet tabs.

More data series?

To create a chart that has more data series than categories in Excel 5 or 7, select the cells that contain the data and labels to plot.

Choose Insert, Chart, As New Sheet. The Chart Wizard dialogue box appears. Click Next until Step Four appears.

Under Data Series In, click Rows. In the Use First Row(s) For Category (X) Axis Labels box, accept the default of 1, or insert it.

Under Use First Column(s) for Legend Text also insert 1. Click Finish for Step Four, then Finish for Step Five.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets and solutions to be shared, via *PCW* Editorial at the usual address or at **Stephen_Wells@msn.com**.

Files can be attached if you're on MSN or Demon.

Blood, sweat and **coding**

Mark Whitehorn reports from Database Expo, where he has been judging a programming application contest. Plus, two ticklish problems, taped.

I have just returned from Database Expo, which was run as one of the IT Expo group of events. It's held in Birmingham at the end of June and if you missed it this year, pencil it in for next because it was great. The exhibition organisers also ran a RAD (Rapid Application Development) race as part of the exhibition. The rules are simple. A charity in need of a database is selected (in this case NACRO — National Association for the Care and Resettlement of Offenders). The charity submits a set of requirements from which a formal specification is drawn up. Teams consisting of up to two programmers are given two days to develop an application which meets the specification.

I was asked to be one of the judges and, along with the others, was keen to make the application development in the race as close to reality as possible. So we decided to allow the contestants to use not only any commercial software which took their fancy, but also any and all toolboxes, commercial or otherwise. Although other races of this kind tend to restrict contestants to shrink-wrap development tools only, we felt the open approach was by far the more realistic. How many good developers have you met who don't have their own toolboxes? Additionally, in these object-orientated days, the extensibility of a development tool is a major consideration.

Secondly, we decided that we would announce a change to the specification during the morning of the second day. After all, have you ever worked on a specification which didn't change during development? We felt that this would favour teams and tools which were adaptable: a highly desirable trait in both. After some deliberation, we decided to warn the contestants at the start of the competition that this "Judges' googlie" was coming (mainly through fear of physical violence if we bowled it to them unannounced!).

The competition went well, and was won by the Borland/Dunstan Thomas team. The tool was Delphi and the team consisted of Jason Vokes and Colin Ridgewell. Dunstan Thomas is one of Borland's Client/Server Partners based in Portsmouth which specialises in developing client/server and internet business systems.

One company, notable by its absence from the contestants, was Magic. This is a company which, over the years, has built a comprehensive advertising campaign around winning races of this type. What made its absence all the more apparent was that it had initially been a keen supporter of this particular race. In May, Graham Young, marketing manager for Magic software had said, "We believe that the professional software development industry needs an attractive one-stop shop for showcasing the latest technologies and products. With Blenheim's (the exhibition organiser) backing, the RAD race is well-positioned to become an important milestone in the IT calendar."

With about one week to go before the race, Magic announced that it had decided not to enter a team. The reason given was that Magic felt it had already demonstrated its superiority in this field. Graham Young told me afterwards: "We've already thrashed Delphi on many occasions in the past." While this is perfectly true, we are talking about a different competition, here, with a different target application and a unique set of rules (including the unusual "open toolbox" item).

One is left to ponder whether its past victories were the only reason for Magic's non-participation? For a start, in a rapidly evolving field like database development tools, superiority needs to be regularly demonstrated. Last quarter's victory is as stale as yesterday's news; and for a company to refuse what might perhaps be an easy victory (with its associated positive publicity), may be laudable but is unlikely to impress the shareholders.

Whatever the reason, I really hope that Magic takes part next year. The more teams that take part, the more impressive the win — whoever gets it — and it could be you. Why not talk to your boss about entering yourself and a colleague as a team? We can promise you two days of sweat, blood and coding. What better break could there be from the daily grind?

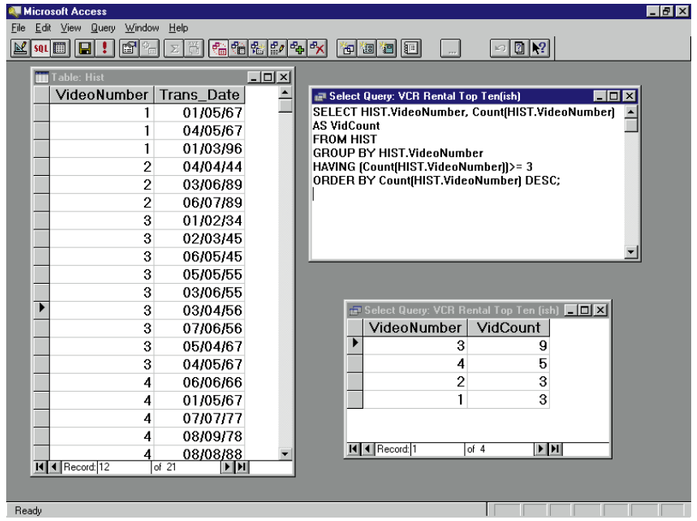

Fig 1 **Since the data files are small, this query is finding only those videos which have been rented out three or more times, but it illustrates the general idea**

A rental problem, taped

"*I am nearing completion of a program to handle videotape rental. Each transaction is written to a history table to provide flexible reporting.*

The table HISTORY contains information about videos and customers but the important fields are Video_no and Trans_Date. Using Video_No and the function COUNT, you can produce a list giving Video_no and the total number of times that video has been hired — essentially a top ten list. If you bring Trans_Date into the equation you can produce a top ten for a specific period, say the last two weeks, which is far more useful.

Unfortunately though, this is not a true top ten list. SQL will return a set containing a record for each video on the system (in practice this is between one and 12,000 records). Is there a way to return just the first ten records? I'm no SQL wizard and in my experience the answer is definitely 'no'. Perhaps you know better?

Here is my SQL (cut to a minimum):

```
SELECT HIST.VideoNumber,
 count(HIST.VideoNumber) as
 HIST.VidCount
FROM ":DBVIDEO:HISTORY" HIST
GROUP BY HIST.videonumber
ORDER by HIST.VidCount DESC
```

I am using Borland Delphi with Paradox tables and Borland's Local-SQL. I'm not looking for an application-specific solution but the low-end SQL implementations often omit features that ORACLE and GUPTA users take for granted. Local-SQL does not support nested SELECT statements."

Eamonn Mulvihill

The good news is that you are correct. My understanding is also that it can't be done with "standard" SQL. The bad news is, of course, that being correct doesn't help you to solve your problem: a bit of a video nasty. Given that what you ask is impossible in Standard SQL, any answer I give is going to be more or less unsatisfactory; but it may be helpful, particularly to other readers. An Access derivation of your SQL would be:

```
SELECT VideoNumber,
 Count(VideoNumber) AS VidCount
FROM HIST
GROUP BY VideoNumber
ORDER BY Count(VideoNumber) DESC;
```

One approach to the problem would be to set a value for Count(VideoNumber) above which you want to see the video. For example, you might know that the top-selling (renting) ones are often taken out, say, 12 times or more. So you could use the form:

```
SELECT VideoNumber,
 Count(VideoNumber) AS VidCount
FROM HIST
GROUP BY VideoNumber
HAVING (Count(VideoNumber))> =12
ORDER BY Count(VideoNumber) DESC;
```

This lists only those videos which have been rented out more than 12 times (Fig 1). I know that this won't necessarily give you exactly ten videos as the answer, since fewer or more may fit this criterion, but you might, with some practice, be able to get approximately the answer you want. For Access freaks, there is a sample table and query in this month's .MDB file on our cover-mounted CD-ROM.

The variation is an Access-specific variation which will give the top 10.

```
SELECT Top 10 VideoNumber,
 Count(VideoNumber) AS VidCount
FROM HIST
GROUP BY VideoNumber
ORDER BY Count(VideoNumber) DESC;
```

As an aside, it is tempting to hope that these SQL statements will execute faster than one which returns usage counts for all the videos. However, whether ten or 10,000 records are returned in the answer table, the entire base table still has to be scanned in order to provide the answer.

An eggsacting problem

"*A client runs a medium-sized food wholesale business. He has asked me to design a system in which each customer can have certain products at different prices. For instance, one client might negotiate a*

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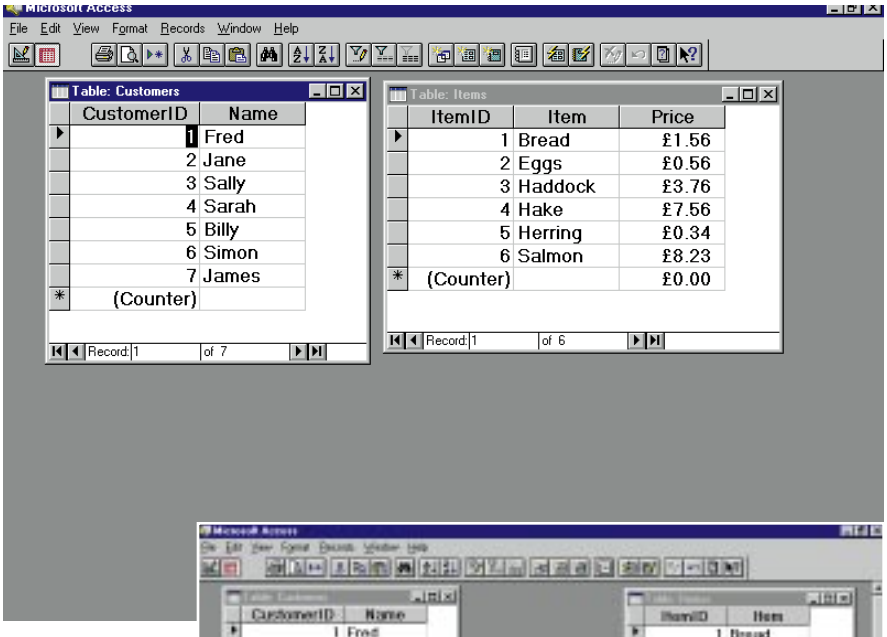

Fig 2 (above) Two sample tables for the second problem. Note, seven customers and six items

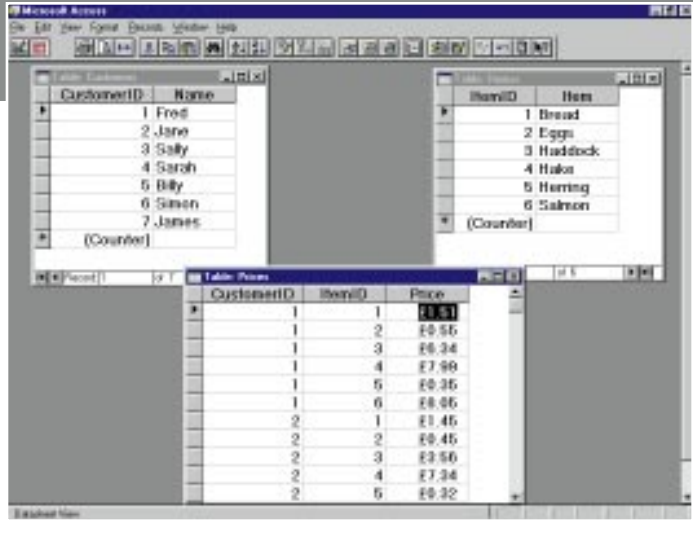

Fig 3 (right) We can use a third table to match every customer to every item. Note the tiny sample tables used here mean 6 x 7 = 42 records in this table. The real problem would generate about 140,000

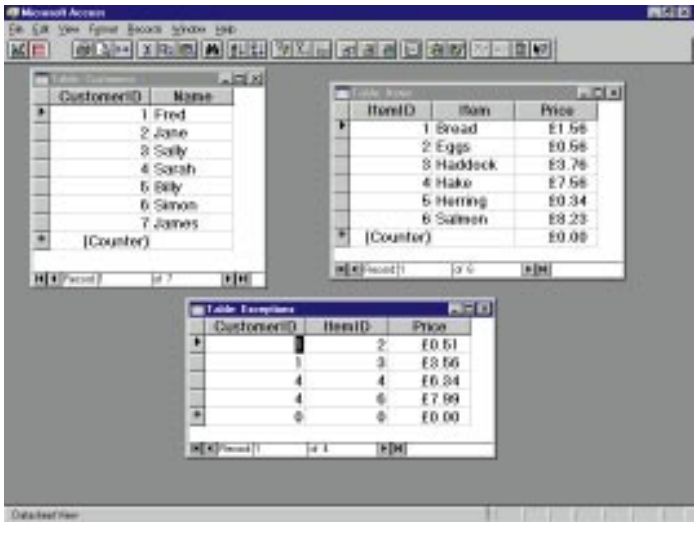

Fig 4 (right) Two tables store the basic data, and a third stores the exceptions to the rule

special price on, say, eggs, while another might have a special price on milk.

Given the logic of database design, my solution was to try to have three or four price lists calculated as queries and to have a field in the customer table assigning each client to a particular price level. However, this does not provide the client with the flexibility he requires, nor is he satisfied with the idea of combining the last solution with, say, a special overall discount (this being stored in the customer table).

Given that he has some 400 customers and 300+ products, the whole thing is becoming a major headache. Any suggestions, apart from aspirins or suicide, would be immensely welcome."

Mark Squire

Hmm… hopefully no aspirin or suicide required. This is an excellent problem because it is one example of a generic class of problem and as such is worth examining in some detail. As usual, the solution is shown in Access but could be implemented in any RDBMS.

Let's assume that we start with two entities: Customers and Items. Each gets their own table, as shown in Fig 2. Just for now, let's assume that all customers pay the same price for each item even though we know it isn't true. So in this case, the price would be an attribute of the entity Item and would therefore be placed in the same table, as shown.

Now let's assume that each customer negotiates a unique price for every item and that there is no standardisation whatsoever (equally untrue). In this case, we would typically generate a third table which tied the first two together and we would move the prices into that table (Fig 3). In practice, given 400 customers and, say, 350 products, this will be 400 x 350 = 140,000 records in the joining table. Big, but necessary.

These two approaches represent opposite ends of the spectrum. At one end, each item has but a single price. At the other end, each customer-item interaction has a price, and we position the pricing information accordingly. Mark's problem is that the real-world problem he is trying to model falls somewhere in-between the two. Most of his customer-item interactions use the default price, and a few are exceptions.

One answer is to put the default prices back into the Items table and create an Exceptions table which stores the exceptions to the defaults. Never let it be said that I can't pick suitable names for my tables.

This stores all the data in a reasonably efficient manner (Fig 4). As far as I can see, remembering from a couple of issues ago that this is an art, not a science, there is not much duplicated data here. So that's the problem solved, isn't it? Well, "yes" in terms of storage, but a big "not yet" in terms of implementation. How do we actually look up the price of an item for a particular customer?

A reasonable question is, "How would we do it if this were a paper-based

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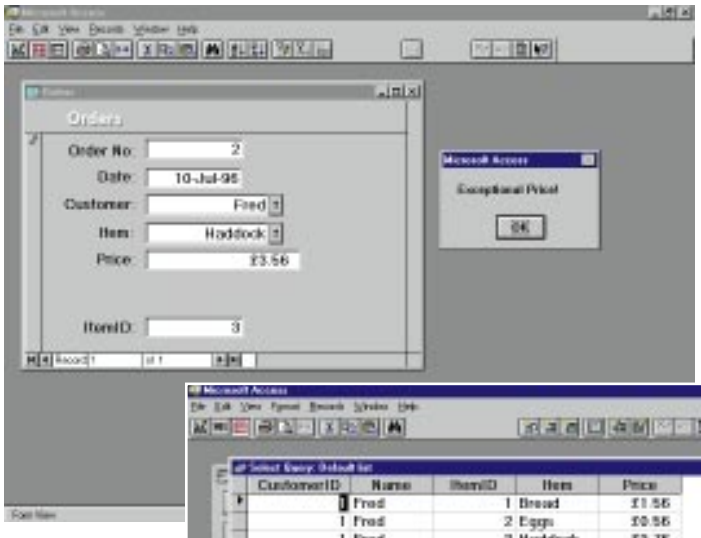


Fig 5 This form ties the Items and Exceptions tables together using code tied to the "After Update" Property of the Item combo box. The code pops up a message box telling you the price is an exception

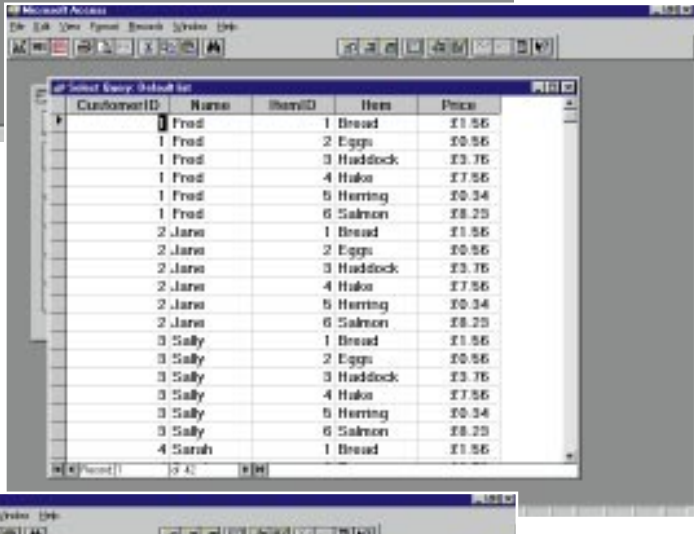


Fig 6 This query shows every default price for every customer. Note that there are seven customers and six items, so this table has 42 records

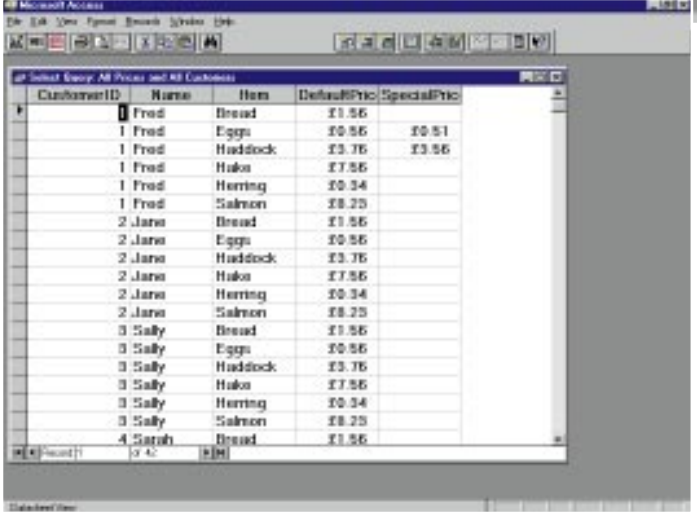


Fig 7 This query adds in the special prices where appropriate. Could be better though: any ideas?

Items and Exceptions

```
SELECT DISTINCTROW Customers.CustomerID, Customers.Name, Items.ItemID,
Items.Item, Items.Price
FROM Customers, Items
ORDER BY Customers.CustomerID, Items.ItemID;
        followed by
SELECT DISTINCTROW [Default list].CustomerID, [Default list].Name,
[Default list].Item, [Default list].Price AS DefaultPrice,
Exceptions.Price AS SpecialPrice
FROM Exceptions
RIGHT JOIN [Default list] ON (Exceptions.CustomerID = [Default
list].CustomerID) AND (Exceptions.ItemID = [Default list].ItemID);
```

Fig 8 Generating a table from Items and Exceptions

system?" If a customer ordered an item, we'd look first in the exceptions list to see if there was a special price. If not, we'd look in the standard price list and use the price shown there.

This effectively defines the algorithm I have used in the form shown in Fig 5. You select the Customer using the first combo box and then the Item with the second. A block of code runs whenever the second combo box is updated, which says:

1. Open the Exceptions table.
2. Search for an entry which has this customer and this item.
3. If an entry is found, copy the price from that record into the price field on this form.
4. If not, open up the Item table, find the correct item and copy the price from there.

This form is actually based on a simple Orders table, which records the date, customer ID, Item ID and Price. Please note that this is not a complete implementation since we all know that Orders are usually for more than one Item. The form is logically flawed at present. The price is only checked when the Item combo box is updated, so you can fool the system by selecting the Item and then changing the customer. However, it does demonstrate that the data can be pulled from the correct table in a manner which is transparent to the user.

Just out of interest, if we suppose that almost all of the prices were unique (which would then favour the use of a large joining table as described above), it might still be advantageous to keep the prices in the Items and Exceptions table. We could update the Exceptions table as changes occurred and then use a make-table query to generate the 140,000-record table which would be used on a day-to-day basis.

I was musing about the best way of generating such a table from Items and Exceptions, and the best I could come up with is shown in Fig 8.

The first query generates a list of all Customers and all default prices (Fig 6) while the second adds the special prices to that, where appropriate (Fig 7). I'd be the first to admit that it isn't perfect because it doesn't replace the default price with the special one when both occur in the same record. Can anyone come up with a better solution?

PCW Contacts

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. He's on **m.whitehorn@dundee.ac.uk**

Packing it in

VoiceType Dictation is just one of the attractions of Merlin (the new version of Warp), and also why it needs a hefty system to support it. Terence Green speaks out.

I've been getting some hands-on experience with Merlin lately and thought a couple of tips for readers contemplating the upgrade when it arrives might be appropriate. Get more memory. Get a bigger hard disk.

The addition of OpenDoc, Java, network connectivity, VoiceType Dictation and an expanded Bonus Pack takes a full install of the beta to nearly 30 megabytes, and speech dictation and navigation really churns the swap file on a 90MHz Pentium with 16Mb RAM, the proposed recommended minimum when it hits shrinkwrap.

One expects a beta not to be optimised, but I've decided to upgrade from my old 66MHz 486DX2 and 16Mb RAM to a Pentium 100 with 24Mb for regular work. Speech dictation and navigation is something I'd really like to use on a daily basis, especially as I'm starting to suffer pains in my arms from using a mouse to travel around the web. My use of a mouse has increased considerably over the last few years through using the internet and I've been remiss in not paying more attention to proper posture. Merlin's support for speech-enabled Web browsing is another plus that I hope will reduce mouse use.

CD CONTENTS

This month the OS/2 content for the cover CD contains several video drivers, printer fix-packs, some games demos, and a number of utilities. Take a look in the Resources section under the OS/2 category. All files are contained in the file CD30S2.ZIP.

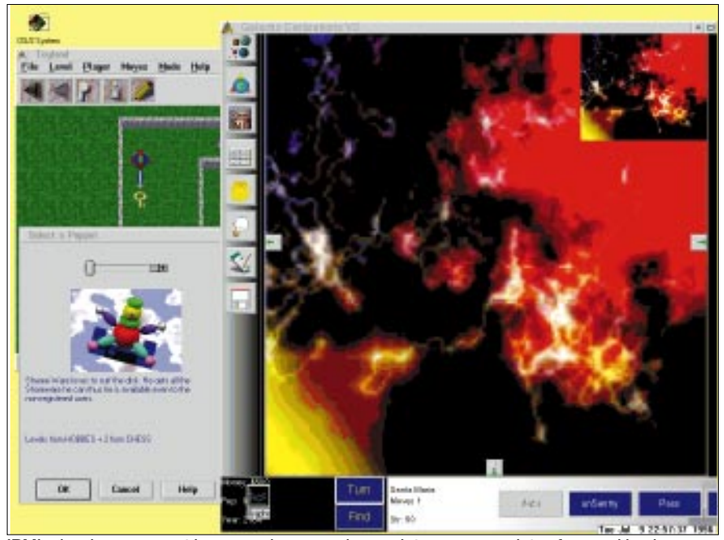
The trouble is that as soon as VoiceType Dictation comes into play you're looking at about another 8Mb RAM to support it properly, so I don't think my old 16Mb system is going to be good enough for the work I do now plus VoiceType Dictation. I'm only sorry that a week after I bought the RAM, I could have bought twice as much for the same price. Buy now while stocks are cheap. It'll also help on those occasions when I run Windows 95 and Windows NT.

Slamming in the RAM helps, but tuning the system for performance is an important consideration too. There are a number of simple edits to the CONFIG.SYS that can speed up the system and make it run noticeably smoother. The CNFGINFO freeware tool which was on the *PCW* July cover CD is a really useful tool to have around, as you can work your way through CONFIG.SYS optimising the way your system uses memory.

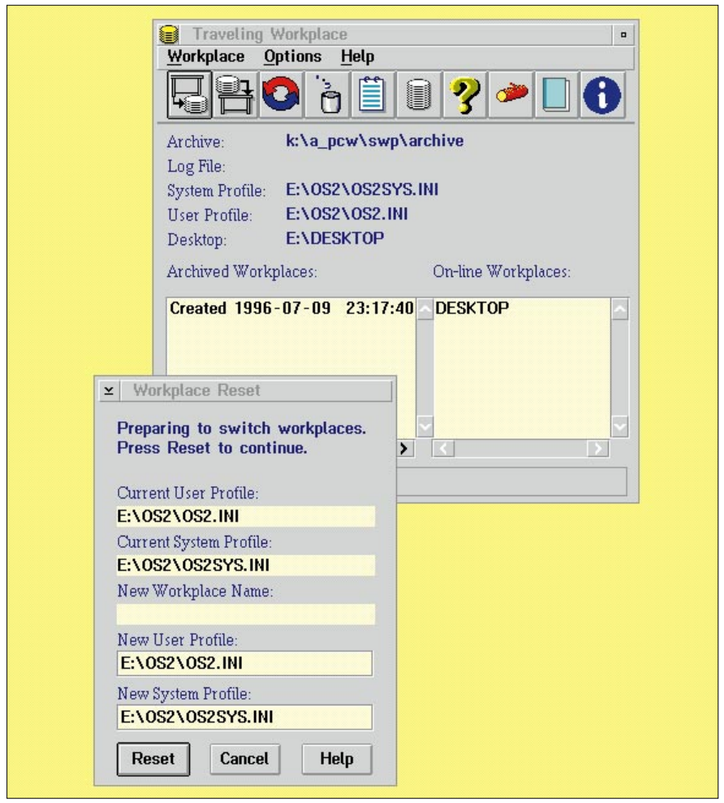
GO SCSI

Before jumping into the nitty-gritty, though, bear in mind that there's one other guaranteed way to boost speed other than adding RAM, and that's to run OS/2 from a SCSI drive. The fastest Enhanced IDE drives can have a theoretical maximum throughput of about 16Mb/sec but real throughput will be much lower because the IDE controller really chews up CPU time. A modern two-channel PCI busmaster SCSI-2 controller such as the Adaptec 3940 can manage 20Mb/sec through using both channels.

A SCSI adapter costs a bit but they're a much better match for multitasking, multi-threaded 32-bit operating systems such as Warp and Windows NT because the intelligent SCSI controller takes over much of the CPU work involved in passing data between the SCSI interface and the attached drives. Busmaster SCSI host adapters are even better: they pass data directly between system memory and the SCSI bus, almost entirely cutting out the CPU as middleman. Most EIDE drives use programmed input/output (PIO) which keeps the CPU occupied throughout data transfers.



IBM's developer support has never been good enough to encourage lots of general business applications, but games developers abound *(see cover CD)*



Traveling Workplace goes beyond the basic desktop archiving system in OS/2 Warp to enable multiple archives of the system startup and desktop files that can not only be saved and restored but also swapped around on a whim *(see cover CD)*

A well-known Warp performance tip is to use multiple drives and to distribute operating system, applications and data across two or more drives. With multiple IDE drives this doesn't produce much benefit because the EIDE interface allows one active device at a time. By contrast, a dual-channel SCSI-2 host adapter with two or more drives can keep several drives active, ensuring a peak data flow of 20Mb/sec with 8-bit Fast SCSI-2 drives. For servers, a Fast & Wide (16-bit) SCSI host adapter can deliver 40Mb/sec over a PCI bus.

The first item to put on a separate drive if you have two or more is the swap file (SWAPPER.DAT). To do this, edit the "SWAPPATH =" line in CONFIG.SYS and point it at a different drive to that on which the operating system is installed. The general rule is to have the swap file on the most used partition on the least used hard drive. Put it in the root directory rather than a sub-directory, and it's better if it's an HPFS partition. The change will take effect after the next reboot. Remember to delete the defunct SWAPPER.DAT at the old location — Warp isn't *that* smart.

While you're editing SWAPPATH, increase the size of the second numeric variable in order to pre-allocate a swap file that approximates the size the swap file reaches when you're running your usual applications mix. Type HELP SWAPPATH at an OS/2 command prompt for a detailed explanation. You can either monitor SWAPPER.DAT manually with DIR commands (its default location is x:\OS2\) or use a swapfile monitor such as DINFO (included on the July cover CD). Pre-allocating a larger SWAPPER.DAT slows down boot time a little, but you'll feel the difference when you start to run out of

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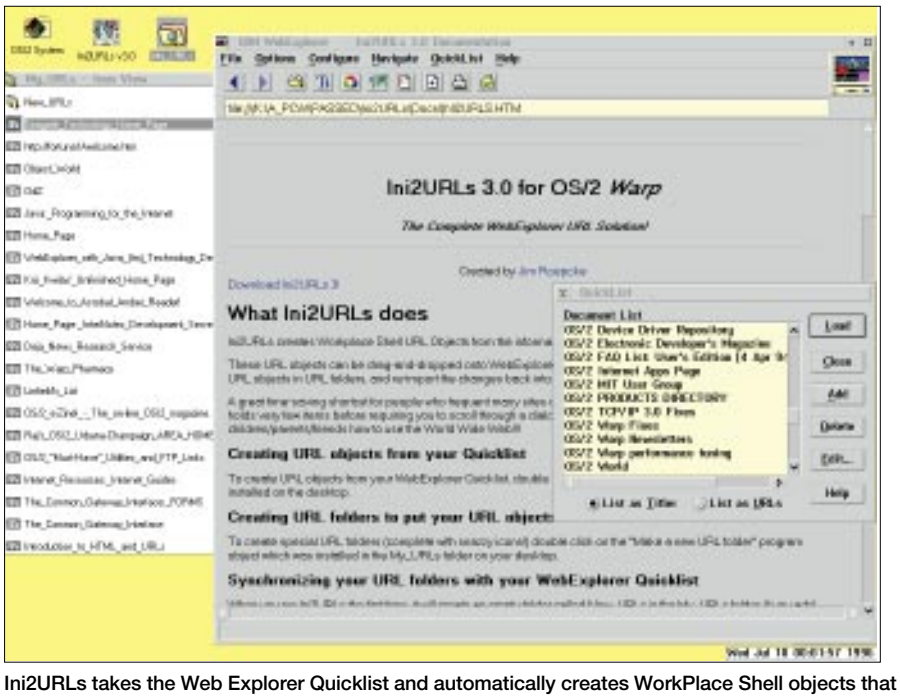

Ini2URLs takes the Web Explorer Quicklist and automatically creates WorkPlace Shell objects that can be organised in URL folders and dragged onto the Explorer to go to a web link *(see cover CD)*

memory and OS/2 doesn't have to expand the swap file immediately.

Cache size

After tinkering with the swap file, the next step is to adjust the cache buffers. Warp's default settings, which are set in CONFIG.SYS, are fairly conservative. The DISK CACHE statement applies to FAT partitions while the CACHE parameter in the opening IFS statement applies to HPFS partitions. The CACHE parameter controls the HPFS cache. In systems with 16Mb RAM or more, set it to 2048 (Kb). With 8Mb RAM set it to 1024. Or check with the CNFGINFO utility for more detailed advice.

FAT drive cacheing (but not floppy disk drives) is controlled by the DISKCACHE statement in CONFIG.SYS. In Warp it defaults to DISKCACHE=D,LW. LW enables write-back cacheing while "D" stands for a set of defaults which are dependent on the amount of system memory (RAM) in the particular machine. Replace "D" with a specific number, 1024 if you have 16Mb RAM or more and 256 for 8Mb RAM.

Windows performance

One of the great benefits of OS/2 is its ability to run the majority of DOS and Windows applications alongside OS/2 applications. But sometimes Windows applications performance can be sluggish. If you find that actions such as scrolling speed up when you "twitch" the mouse over the application, try these settings under the Settings button of the Win-OS/2 Setup icon in the System Setup folder.

```
DOSHIGH = ON
DOS FILE = 50
DPMI MEM LIMIT = 64
HW ROM TO RAM = ON
IDLE SECONDS = 60
IDLE SENSITIVITY = 100
```

Remember that if you enable Fastload in WIN-OS/2 Setup it applies only to seamless Windows, not Full Screen Windows sessions. Fastload loads the Windows code into memory at bootup which speeds up the process of loading the first Windows application. The caveat is that you must set up WIN-OS/2 and any Windows applications you want to run with compatible settings. If you start a Windows application in a separate session or set it to run in Standard mode when WIN-OS/2 settings are set to Enhanced mode, that Windows application will load in a new Windows session which will load another instance of the Windows code into memory.

Printing performance

In order to deal with the plethora of sound cards whose preferred option is IRQ 7, a change was made to the print setup for Warp which defaults to printing by polling rather than using interrupts as did previous versions of OS/2. This may cause slowdowns, though, as polling is slower and can be interrupted by other running tasks.

Other problems reported might be "Printer not responding, offline, out of paper, turned off...". Enable interrupts (IRQ7 for LPT1: and IRQ5 for LPT2: by adding the "/IRQ" qualifier to the base printer driver in CONFIG.SYS. Change it to read "BASEDEV=PRINT01.SYS /IRQ".

Hard disk problems

One of the worst problems that can arise when running OS/2 is when the boot files become corrupted and you can't boot up and the system issues a SYS1475 error message. There are a number of other messages associated with SYS 1475 including: cannot boot to OS/2, OS2BOOT cannot be found, or Operating System missing.

First check to see whether there's a non-bootable diskette in the floppy drive as this will also trigger a SYS1475. If not, you can restore the system files to the hard disk by booting with the original Installation Diskette. Insert Diskette 1 when prompted, and when the Welcome screen appears press F3 to go to the command prompt. Now re-insert the Installation Diskette and type SYSINSTX D: where D: is the drive where the OS/2 system is installed. That should replace the system boot files and allow the system to boot.

A more usual problem arises when, after adding a new hard disk, OS/2 fails to boot. The problem in this instance is that the new hard disk contains a primary partition which has caused OS/2 to re-map the drives. OS/2 follows DOS conventions for logical drive mapping. Primary partitions are assigned letters first on a drive by drive basis, followed by logical drives in extended partitions also in drive order from first to last.

In a single-drive configuration the first primary partition is C: followed by D:, E:, F:, etc. for logical partitions. If you have installed OS/2 on any partition other than C: and you then add a second drive, be sure to boot under DOS first (use a DOS boot floppy) and FDISK the new drive with an Extended Partition containing logical drives only. Do not create a primary partition on the second drive because it will take the letter D: when the system boots up and your OS/2 system will be unable to start.

PCW Contacts

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Prime candidate

Prime functions take centre stage and hailstones are a big hit, in this month's maths musings. With Mike Mudge.

The first area of investigation this month is due to Jonathon Ayres of Leeds, who writes as follows:

Highest prime function

I have recently been investigating what I have called the highest prime function — HPF(X), which is defined as the highest prime factor of x, so that HPF(7) = 7 and HPF(10) = 5.

1) Highest prime function sequence

HPFS(x_0,x_1) is defined so that

$Xn = HPF(X_{n-1}*X_{n-2}+1)$

So,

HPFS(1,2) = 3, 7, 11, 13, 3, 5, 2, 11, 23, 127, 487, 1237, 331,127,21019, 1811, 140983, 2239651, 10005473, ..

and

HPFS(3,2) = 7,. 5, 3, 2, 7, 5, 3, 2, and so on

(this has period 4).

Questions

1). Do all HPFSs eventually lead to recurring sequences? For example, HPFS(x,y) leads to a,b,c,d ... a,b,c,d, and so on. If not, do all the non-recurring HPFS go through all possible numbers? (The function

$HPFS(x_n) = HPF(x_{n-1}*x_{n-2}*... x_1 , x_0 +1)$, starting 2,3,7, 43, 139 ..

has been shown not to repeat, nor is it ever equal to

5,11,13,17.)

2). For recurring HPFS, what are the smallest numbers a,b so that HPFS(a,b) has period n, and are there any values of n so there are no HPFS(a,b) with period n?

3). How many different HPFS do numbers converge to? For instance, HPFS(2,3) and HPFS(2,11) converges to the same sequence?

4). What happens for related sequences such as:

a) Lowest prime factor sequence

LPFS(3,7) = 2,3,1 .....

b) Highest alliott divisor sequence (not including the number itself)

HADS(3,5) =8, 1, 3, 2, 1,...

c) HPFSm(a,b) = HPF(a*b+m)

d) HPFS(a,b,c) = HPF(a*b*c+1)

Highest Prime Hailstone Function

This is similar to the "Hailstone Function", which is defined as: if n is even, then n is divided by 2, else it is multiplied by 3 and one is added.

The highest prime hailstone function,

$HPHF_{(a,b)} (x_n) = HPF(a*x_{n-1}+b)$

$HPHF_{(2,1)} (1) = 3, 7, 5, 11, 23, 47, 19, 13, 3, 11, 23, 47, 19, 13, ...$

has period 7, with the lowest value in the periodic sequence being 3 and the highest 47.

The table above shows the period, lowest and highest value for the recurring sequence which $HPHF_{(n , 1)}$ (1) leads to.

Values for recurring sequence

N	Period	Lowest value	Highest value
2	7	3	47
3	5	2	17
4	7	5	71
5	3	2	11
6	18	13	13219
7	3	2	23
8	12	11	1097
9	5	13	97
10	6	43	15971
11	2	17	47

Questions

1). Do all $HPHF_{(a,1)}$ (1) lead to recurring sequences, and how does the period, lowest and highest value change for different a (for example, a being prime, then the period seems to be quite low)?

2). Do all $HPHF_{(a,b)}$ (x), for fixed a,b and variable x, lead to recurring sequences?

For fixed a and b, is there more than one recurring sequence? For example, $HPFH_{(9,1)}$(1) leads to a sequence with lowest value 13, highest 97 and length 5; and $HPF_{(9,1)}$(41) leads to a sequence with lowest value 37, highest 269 and length 7. If so, how many different recurring sequences?

For fixed a and b, what value of x takes the longest/shortest time to reach a repeating sequence, and what value of x reaches the highest values?

3). Do all HPHF lead to recurring sequences?

Any responses to these problems to be sent to: Mike Mudge, 22 Gors Fach, Pwll-Trap, Carmarthenshire SA33 4AQ (01994 231121), by 1st January 1997.

Spot the difference

Stephen Saxon, of Stockport, has suggested an interesting problem — it combines an area of mathematics predating computers "as we know them" by several centuries, with current programming techniques. The question is, how to fit a polynomial of the lowest possible degree to a set of equally spaced data points? An answer will be provided next month by The Calculus of Finite Differences or, as Stephen calls it, The Newtonian Difference Method.

•PCW Contributions Welcome

Mike Mudge welcomes correspondence from readers on any subject within the areas of number theory and computational mathematics, together with suggested subject areas and/or specific problems for future Numbers Count articles.

The perfect **host**

If you want to add peripherals to your PC, SCSI is the ideal choice of interface. Roger Gann shows you how to install a SCSI host adaptor.

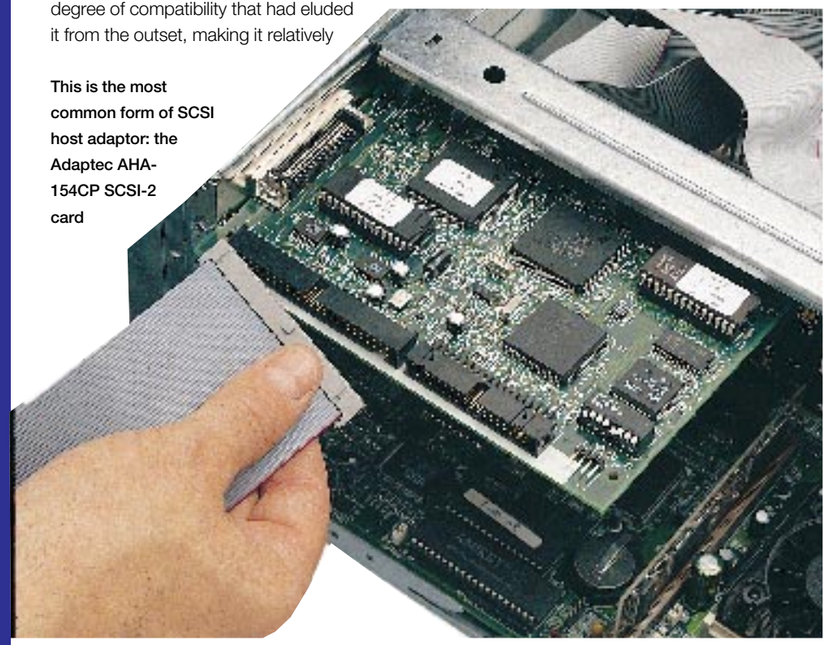
Although much of SCSI's thunder has, in recent years, been stolen by Enhanced IDE which offers great performance, ease of installation and value for money that's hard to beat, the basic strengths of the Small Computer System Interface (SCSI — pronounced *scuzzy*) remain undiminished.

SCSI remains the interface of choice for advanced PC peripherals such as very large, hard AV drives, magneto-optical drives, writable CD-ROMs, DAT tape drives and scanners. It offers the ultimate in data throughput, good flexibility, and lately a degree of compatibility that had eluded it from the outset, making it relatively painless to add a multiplicity of diverse peripherals to your PC.

For serious multimedia work, SCSI is essential, guaranteeing the very high data throughputs required when handing video and audio streams. While it's true that Mode 4 PIO EIDE hard disks can deliver 16.6Mb/sec and that the latest eight-speed IDE CD-ROMs can deliver 1.2Mb/sec, this method of transferring data requires such a high degree of CPU intervention that it affects the CPU's ability to further process the data it's transferring, such as video or MPEG data streams. This problem doesn't occur with SCSI because data transfers are controlled by the host adaptor and hence steal few, if any, CPU cycles.

As its name implies, SCSI is a system interface rather than a device interface, which is designed to operate with specific devices such as disk or tape drives. System-level interfaces on the other hand are more general purpose, designed like expansion buses to match virtually any kind of device to a computer system. What makes SCSI so special is that it's "smart", and has some of the advanced arbitration features of the EISA and Micro Channel buses used in PCs.

The original SCSI specification featured an 8-bit data path at a maximum speed of 5MHz, providing a maximum possible data transfer rate of 5Mb/sec. "Wide SCSI" doubles the width of the data path to 16 bits (and allows for further widening to 32 bits) with transfer rates from 10Mb/sec to 20Mb/sec. "Fast SCSI", meanwhile, doubles the data rate across the SCSI connection by doubling the speed to 10MHz. A system that takes advantage of all SCSI-2 possibilities (i.e. Fast *and* Wide) can achieve a data transfer rate as high as 40Mb/sec, though these are fairly rare. A final benefit of SCSI is its ability to extend the "reach" of a single expansion slot: each SCSI host adaptor can support up to seven devices, and you can have more than one SCSI host adaptor.



This is the most common form of SCSI host adaptor: the Adaptec AHA-154CP SCSI-2 card

Installing the card

As is often the case, this is a two-part job: installing hardware first, followed by the software. If you're not running Windows 95 then you'll need to know just what hardware resources (i.e. IRQs, DMA channels, I/O ports and ROM addresses) are already spoken for in your PC. This is so that you can identify any potential hardware clashes in advance and adjust the settings on the SCSI card before you fit it.

I thought I'd mastered the arcane mysteries of SCSI a long time ago, but only last week, when I was fitting an external Zip drive, my system was brought to its knees for an afternoon by a common or garden SCSI card — and this was a PC running Windows 95! Time spent gathering hardware resource information is time well spent and can prevent much frustration.

The most common brand of SCSI host adaptor is Adaptec and that's what I'll be fitting: an Adaptec AHA-154CP SCSI-2 card. The default resource settings of this card are IRQ 11 and I/O port 330h and usually these settings are, generally speaking, "free". So all things being equal, they shouldn't clash with anything. However, if problems do arise, this card has a set of easy-to-get-at DIP switches which configure the I/O ports, address space of the SCSI ROM BIOS, and other factors. Other SCSI minutiae are configured by hitting CTRL+A during the boot sequence, which pops up the SCSISelect menu. By contrast, the PCI version, the AHA-2940 PCI Fast SCSI-2 card, is a DIP switch and jumper-free zone and is completely software configurable — perfect for Windows 95.

Hardware installation

Step 1

- Take the usual safety precautions: power down and unplug the PC from the mains and disconnect all other leads, such as printers and mice. If you're unsure which bit goes where, mark where each lead goes when you unplug it.
- Remove any static electricity you might be carrying by earthing yourself before handling any electrical components: touch a metal pipe, for instance; or If you've got one, wear an earthing wrist-strap.

Step 2

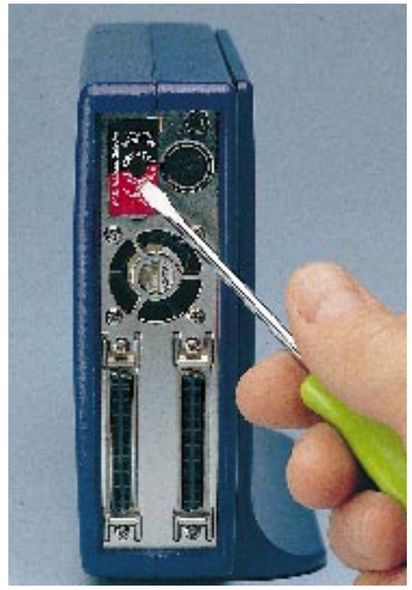
- Take the lid off of the PC. It'll be held on by four or five self-tapping screws and you'll most likely need a Phillips screwdriver to undo them — don't lose the screws!
- OK, you can now see the inside of your PC. If you're going to do detective work to discover the hardware resources used by the existing cards, do it now. Choose a free 16-bit ISA expansion slot. Undo the bolt securing the blanking plate at the end of the slot and remove the blanking plate.

Step 3

- Hold the card firmly by its top edge and press its gold edge connector firmly into the expansion slot. Watch the clips on the external SCSI connector: they often get in the way, or get trapped.
- Do up the bolt to secure the card. If you already have a floppy interface, flick DIP switch 5 to disable the floppy interface of the Adaptec card.

Step 4

- If you're installing any internal SCSI devices, set their ID and termination before fitting them in their drive bays.
- Plug in the power leads and make sure your internal SCSI ribbon cable has enough connectors for all your devices.
- Hook up the ribbon cables to the internal SCSI devices and, as always, note the coloured edge of the ribbon cable — this has to be aligned with the same side as Pin 1 of the sockets at each end.



Every SCSI device must be assigned a unique SCSI ID, from 0 to 7

SCSI Troubleshooting

It's often at this point in the procedure that you'll come across problems. If it's an IRQ clash, this is easily changed by hitting CTRL+A and using SCSISelect. If it's an I/O or ROM BIOS address overlap you'll have to flip some DIPs, but as the switch block is on the top edge of the card there's no need to yank it out to get at them. If the problem isn't a blatant hardware resource clash, look for the obvious errors: two SCSI devices with the same ID number, a loose connector or termination plug, or a SCSI device that's not turned on. Once you've excluded the obvious, you can look for the subtle.

Double-check your work

Verify that your SCSI devices are compatible with your host adaptor. With ASPI systems, make sure that you've installed both host and peripheral drivers. Watch for driver error messages by using the F8 interactive boot option.

Juggle with the cabling

Sometimes the cable lengths between external peripherals are critical so try swapping a short cable for a longer one (or vice versa), or moving to a different connector on the ribbon cable. Make sure you snap in place the retaining clips or wires on each SCSI connector. This is particularly important with SCSI connections because they work like old-fashioned Christmas lights: if one goes out, they all go out.

Juggle with the SCSI IDs and device order

Although it shouldn't make any difference which ID is used or where on the cabling "chain" a device is plugged in, changing these is worth a try.

Check termination

Try moving the terminator from the end device, or even adding one in the middle. For example, instead of terminating the last device, try terminating the second-last. Work your way back. Or leave it off entirely.

Divide and conquer

If all else fails, break the SCSI chain in two and try each half separately.

Use the resource kit

Finally, check out the Windows 95 Resource Kit Help file on the Windows 95 CD-ROM. It's a gold-mine of useful troubleshooting advice and information.

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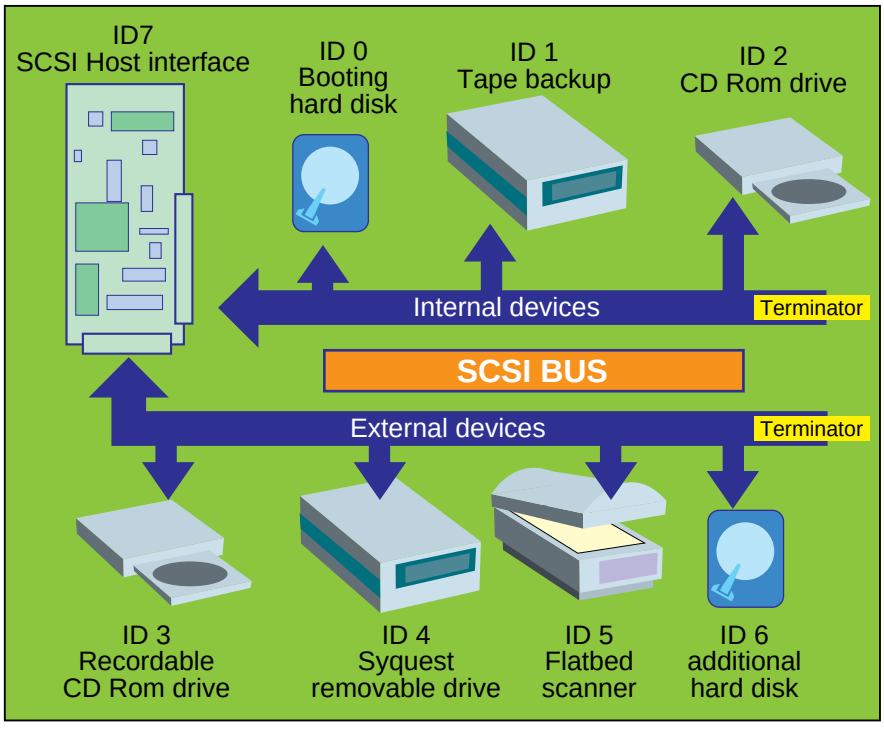

■ If you are installing a bootable SCSI hard disk as well, don't forget to alter your CMOS setup to "No hard disk installed" as the BIOS on the SCSI card takes care of the hard disk from now on. If you're not, disable the SCSI BIOS, otherwise it'll hunt for a drive to boot from, won't find it, and the "timeout" will delay booting up for a minute or so.

Step 5

■ Put the lid back on, do up the screws and plug everything back in, including any external SCSI devices such as scanners or Jaz drives.

Power up the PC and make sure everything is working — i.e. that it will boot up correctly. One new thing you'll notice at boot time is the SCSI BIOS "signing on" after the video BIOS, listing all the SCSI devices it's found.

Step 6

■ If you've installed a new SCSI hard disk as well, now's the time to partition it using AFDISK (Adaptec's version of FDISK) and high-level format it with FORMAT. If you need to low-level format the drive first, this can be done via SCSISelect.

Installing the software

■ Apart from bootable hard disks, all other SCSI devices require some sort of software support so we now need to install some software. This used to be a fraught affair but Adaptec has gone some way, with it's EX-SCSI package, to making the software installation and configuration virtually automatic.

■ If you're running DOS+Windows 3.11, depending on your devices and hardware it'll add these device drivers:

```
DEVICE=C:\SCSI\ASPI4DOS.SYS /D
DEVICE=C:\SCSI\ASPIDISK.SYS /D
DEVICE=C:\SCSI\ASPICD.SYS /D:
 ASPICD0
```

The ASPI4DOS line loads the ASPI driver for the card while ASPIDISK adds support for removable disks such as SyQuest, Zip or Jaz. The third line installs support for a SCSI CD-ROM drive.

■ Windows 95 doesn't need these Real Mode drivers and instead has its own

Hardware terms

AV	Audio Visual
ROM	Read Only memory
DAT	Digital Audio Tape
EISA	Extended Industry Standard Architecture
IDE	Integrated Drive Electronics
EIDE	Enhanced Integrated Drive Electronics
SCSI	Small Computer Systems Interface
PIO	Programmed Input/Output
IRQ	Interrupt Request
DMA	Direct Memory Access
CMOS	Complementary Metal-Oxide Semiconductor
BIOS	Basic Input/Output System

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SCSI Basics

SCSI ID

Just as multiple IDE drive installations require a master and a slave, so every SCSI device (and that includes the host adaptor) must be assigned a unique SCSI ID number.

There are eight SCSI IDs (0 to 7) and typically the host adaptor will take ID 7. Generally speaking, so long as the IDs are unique you can use any ID, the only difference between them being that higher numbers get higher priority during arbitration, so ID 6 will be serviced before ID 5. However, bootable devices normally have to be either 0 or 1. Note that If you already have an IDE drive in your PC then you must boot from this drive — you have no choice.

Most external SCSI devices use a pushbutton or rotary switch on the rear panel to set the ID, while internal SCSI devices will probably use jumpers or DIP switches. The very latest Plug and Play SCSI devices feature SCAM (Self-configuring Auto Magically) and these automatically allocate SCSI IDs without user intervention.

Termination

Just as thin Ethernet network requires termination at each end of the network chain, so does SCSI. A terminator is a bank of resistors that absorbs the excess signals on the SCSI line and prevents them from reflecting back across the cable and causing problems. They can take the form of a plug or a resistor pack that plugs in to the device's circuit board, or DIP switches.

So, if you have no external SCSI devices: the host adaptor will be at one end of the SCSI "chain", with an internal SCSI device (a hard disk, say) at the other. Both devices will need to be terminated and if you fit a CD-ROM in the middle of the chain, between the hard disk and the SCSI card, then it won't need to be terminated because it's not at the end. However, if you fit it after the hard disk, then it will. Similarly, if you plug in an external device this will have to be terminated and the host adaptor un-terminated. Sorting out termination is important as it can prevent your SCSI devices from working properly. Luckily, modern SCSI devices often feature "auto-termination" which can automatically work out which devices require termination.

Cabling

You have to pay special attention to SCSI cables. For a start, external cables must be a minimum of 0.3m long, while the total SCSI chain must be no longer than about 6m. Internal SCSI devices (i.e. those inside the system unit) all attach to one 50-pin ribbon cable that typically has connectors for two devices and the SCSI card. If you plan on adding a third internal device you'll need a ribbon cable with more connectors. If you're re-attaching a third internal drive (a CD-ROM, say), you'll need a new ribbon cable with connectors for as many drives as you plan to install — an 8-way internal cable should cost no more than £25.

Sadly, external connectors are less standardised: there are no less than three types of connector; the 25-pin plug, as featured on Macs and Zip drives, the 50-pin Centronics-style connector, and the newer SCSI-2 50-pin high-density connector. External cables tend to be dear, so expect to pay up to £30.

internal 32-bit Protected Mode SCSI drivers. However, the drivers supplied with the card are likely to be newer than the ones on the Windows 95 CD-ROM, so you should use these in preference. EZ-SCSI 4.0 includes a useful Windows 95 SCSI utility, SCSI Explorer, which lets you change some esoteric SCSI settings, things like automatic drive power down and write cacheing.

•PCW Contacts

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Rays of light

POVRay is a lot of raytracing software downloadable in a 4Mb website file, and despite its heavy maths and programming bias, Benjamin Woolley got to grips with it.

As someone once said, "There is no such thing as a free lunch". But there *is* such a thing as a free raytracing 3D graphics package. POVRay (Persistence Of Vision Raytracer) is among the most sophisticated around and, as I write this column, the Beta test phase of version 3 is drawing to a close. It is available in all flavours including DOS, Mac, Amiga, Unix, Linux and, as tested here, Windows. By the time you read this, the final version should be available, and I urge you to download it from the official POVRay website at www.povray.org or CompuServe's GRAPHDEV forum.

The self-installing executable you get is over 4Mb, but this includes documentation and a generous helping of sample files and some fairly substantial binaries. It is quite remarkable that you can get such a lot of software in a file of this size, given that a commercial 3D package would come on a CD-ROM and colonise half your hard disk.

Installation is no more than a double-click on the downloaded file and a few simple answers to a few simple questions. By the time the disk-thrashing is over, you should find POVRay for Windows seamlessly settled into your Windows 3.11, 95 or NT system (it is a full 32-bit application) and ready to run.

I have to admit that the first time I used it, my feeling was one of disappointment. With POVRay, you re-enter a world that many of us had hoped to leave behind: the world of programming, command-line interpreters, declarations, variables and, (ugh!) maths. What follows is a sample taken from a tutorial in the help file for creating a colour gradient:

If you want to start one of the colours at a specific angle, you'll first have to convert the angle to a colour map index. This is done by using the formula

```
color_map_index = (1 - cos(angle))
/ 2
```

where the angle is measured against the negated earth's surface normal.

I have not personally encountered a cosine since fifth form, and can't remember what one is, except that it has something to do with angles.

However, the mathematically timid should persist because, as I soon began to discover, the wonder of POVRay is that even without maths or a fondness for programming languages you can achieve a great deal.

Unlike commercial 3D graphics packages, POVRay is just a renderer. It does not include a modeller. This means that it takes scene descriptions, essentially 3D graphics programs, and turns them into rendered images. To use it, you have to write these scene descriptions yourself or use a program that will generate them for you.

I began by trying to write a few scenes for myself. There is a series of tutorials in the help file which helps you start coding, and you will find that you are soon able to create simple objects. The best way to proceed is to copy the lines of code supplied in the tutorial and paste them into a text editor. You can save the text as a file with the .pov extension, start up the POVRay renderer, and watch the scene emerge before your very eyes. If you have made a syntax error, POVRay reports which line caused the problem. By adjusting a few parameters here and there and re-rendering the scene, you can begin to get a feel for their effect.

An example of just about the simplest scene description file you can get is given in Fig 1. The "include" statement at the beginning merges the commands contained in the "colors.inc" file into the scene description. "Include" files can contain any legitimate POVRay statement, but are typically used to contain data, such as the definitions of colours, shapes and textures. They define Cyan as having the red/green/blue values 0, 1, 1 which means no red, full green and full blue. The rest of the program does as indicated in the comments prefixed with //.

POVRay has an incredibly powerful scene description language that allows you to create 3D fractals, superquadric ellipsoids (which are objects with soft edges), halo effects, layered fog, and dust clouds. It creates more than those packages costing thousands of pounds. In its atmospheric capabilities, for example, it is ahead of 3D Studio Release 4. To exploit such features to the full, you should probably spend some time poring over the documentation, probably buy a book or two (for example, *Ray Tracing Worlds with POVRay* by Alexander Enzmann, Lutz Kretzschmar and Chris Young), and get the CD-ROM.

For the lazy ones among us, there is an easier way. You get an existing file and mess around with it. This is what I did to produce the image in Fig 2, which was rendered using POVRay version 3. I created it by adapting a 3D Studio file, which meant I could use 3D Studio's modeller to work on the geometry. There are POVRay modellers available as shareware, the best-known of which is Moray. It is not the most wonderful piece of software and if anyone knows of anything better that is free or cheap, drop me a line. Meanwhile, I shall continue to look around for myself.

I converted the 3DS files generated by 3D Studio using a lovely freeware program called 3DS2POV, by Steve Anger and Jeff Bowermaster, downloaded from the CompuServe GRAPHDEV forum. Using a text editor, I adapted the resulting .pov file by borrowing little bits of extra code from the tutorials, to create the clouds in the background. I spent nearly all my time with POVRay using this jackdaw strategy, taking existing bits of code, playing around with them and rendering up the result to see what sort of mess I had made.

Since POVRay is freeware, widely distributed and designed to run on just about every type of computer you can think of, short of Babbage's Analytical Engine, there are endless samples you can use and abuse in this manner. All samples are generously donated by their authors and widely posted across the internet and on various online services, mostly on CompuServe.

Fig 1

```
#include "colors.inc"

// First create a background colour
  background { color Cyan }

//add a camera at position 0 units along the x
//axis, 2 units along the y axis, and -3 units
//along the z axis.  It points towards another
//point at co-ordinates 0,1,2, the position of the
//sphere
  camera {
    location <0, 2, -3>
    look_at  <0, 1,  2>
  }

//create a sphere, two units in diameter and
//colour it yellow
  sphere {
    <0, 1, 2>, 2
    texture {
      pigment { color Yellow }  //
    }
  }

//add a white light
  light_source { <2, 4, -3> color White}
```

Listing for a simple POVRay scene description

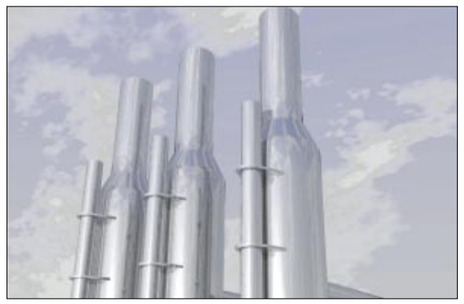


Fig 2 Scene rendered using POVRay. The reflections show some of the advantages of raytracing over faster but cruder scanline renderers

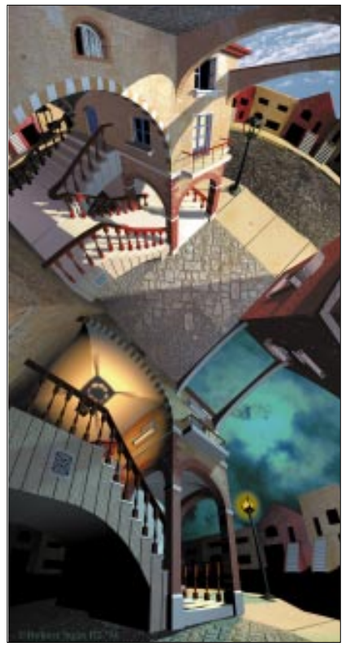
Night and Day

The image pictured right first appeared in *3D Artist*, the American magazine for 3D graphics users. I found it on the magazine's web site, which is well worth a visit: www.3dartist.com.

The picture may be familiar to some of you. It is by Maurits Escher, the Dutch artist who for many expresses the weirdness and beauty of the information age with his mind-boggling images of infinite loops and distorted perspectives. People interested in the origins of his association with computing should look at Douglas Hofstadter's wonderful book, *Godel, Escher and Bach*.

Escher's best-known picture is probably "Ascending and Descending" (1960), which shows little elfin figures trooping up and down a staircase, the bottom of which impossibly connects to the top. Less well known is "High and Low". Well, you see a version of it here, renamed "Night and Day". It was created by Richard Stein III, a 3D artist who worked on the 7th Guest and 11th Hour games for Trilobyte, and who kindly gave me permission to reprint the picture.

Stein generated the image using 3D Studio. He points out, "An X-Y-Z-based program doesn't have enough perspective points for us to build this type of image accurately. Morph software won't do it. Stretching the camera lens beyond fish-eye won't do it. But bending the objects in a specific way just might fake it." And this is exactly what he has done, bending the objects away from the centre so that the illusion of Escher's original picture is reproduced. The result is a fake in the sense that the illusion would quickly be lost if you tried to create an animation that moved through the scene. Because it was generated from a 3D model, Stein could render the scene as a "stereo pair": two pictures showing the same scene from slightly different perspectives, thus giving the image real depth. I spent ages staring at the pair on my monitor, and succeeded in getting flashes of the stereoscopic effect. Escher would have loved it.



At the time of writing, Robert had put a range of his stereo pairs on the web. They are splendid, and you may still find them at www.tbyte.com/people/stein/stereo.htm. I have also reprinted the picture because, to me, it provides an object lesson in the effective use of materials: look at the floor in the centre of the image; the sheen of the stone is perfect. The walls have a rich, almost tactile texture to them. It just goes to show how wrong people are in thinking that computer-generated art is plastic-looking.

PCW Contacts

Benjamin Woolley, writer and broadcaster, can be contacted at **woolley@illumin.co.uk**. His home page is **www.illumin.co.uk/woolley/**

Snap happy

Present yourself in the best possible light, in the strangest locations — and do it using your PC. Gordon Laing looks forward to digital photography and image manipulation.

If we're to believe what the major graphics and imaging manufacturers are saying, and put two-and-two together concerning forthcoming product launches, then photography and computers, digital or otherwise, are going to be the next big thing. It's all coming together. Inkjet printers are being developed to a point where they'll be offering true photographic quality on glossy paper by next year, scanners are becoming increasingly commonplace, and just about everybody and his uncle are releasing digital cameras. The next thing you know, Kodak, Hewlett-Packard, Microsoft and Live Picture go and announce a new imaging format that, while interesting, could be described as Photo CD Mark II.

Yes, it's all happening, so this month I'll fill you in on all the gossip and news. Font fans will be interested in the new AgfaType CD 7.0 collection, and readers will be pleased to learn of a long-awaited upgrade to Adobe Type Manager.

ATM Deluxe 4

After what seems like an eternity, Adobe has announced a new version of Type Manager: ATM Deluxe 4.0 for Windows 95, NT and Macintosh. This will be of particular interest to NT users, who previously had to convert their Type-1 fonts to the TrueType format. ATM addresses many of the problems I have mentioned in earlier columns concerning TrueType and Type-1 font technologies, although so far there's no mention of OpenType.

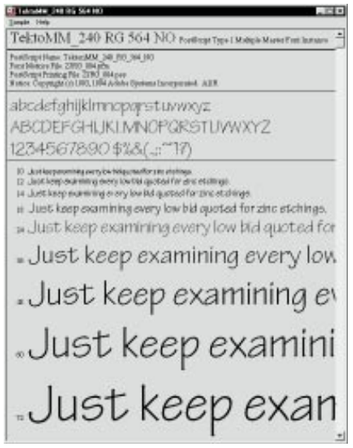
A couple of months ago I printed samples of TrueType fonts with on-screen font-smoothing activated from the Microsoft Windows 95 Plus Pack, compared to Type-1 fonts, as rasterised on-screen by ATM.

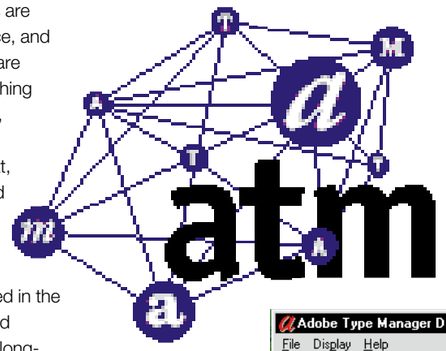
ATM was first marketed as a cure for the "jaggies", by creating bitmaps on-screen at any size — brilliant stuff, and for years we were all satisfied with the results. Then anti-aliasing came along, where grey-shaded dots were placed in the jagged steps of a bitmap outline. When viewed from a distance, the outline appeared smoother.

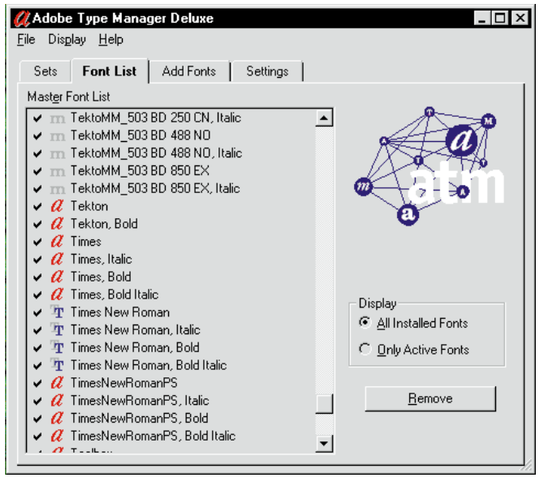
Adobe offered the facility for type in Photoshop, but sadly not from earlier versions of ATM. Buy the Microsoft Plus Pack for Windows 95, and anti-aliasing smoothing is offered for TrueType fonts only. Now ATM 4 will do the smoothing job for Type-1 fonts. It will also manage TrueType fonts, along with Adobe's PostScript Type-1 format.

If you've ever discovered hoards of fonts clogging up your system folders and slowing your machine down, then you'll appreciate the facility to group them into suitably-named sets. Activate and deactivate sets at will and you can even export sets to other machines or across platforms, although the sets contain only lists, not the fonts themselves.

You can finally preview on-screen fonts, and there's improved support for creating







At last, a new Adobe Type Manager: ATM, soon to be available in Deluxe version 4

Right **ATM 4 can manage all your font formats, including TrueType, Type-1 and Multiple Master**

Above right **ATM 4 is able to offer previews of all fonts. Notice that font smoothing is now available for Type-1 formats**

Font of the Month

bayer type
architype

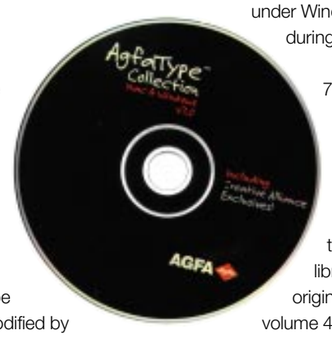
abçdéfghijklmnöpqrstuvwxyz
ß&1234567890

This issue's Font of the Month is Bayer, a typeface revived for Architype Volume 2, created exclusively for the AgfaType library. It was designed by David Quay and is supplied by FontWorks. Quay and fellow award-winning British designer, Freda Sack, established the Foundry in London, in 1990, to design original-quality PostScipt fonts.

multiple master fonts. These latter have the facility to adjust various aspects of the style, such as weight and width. It's a subject I'll be covering in detail in the near future.

And the real bonus? The Windows 95 version was released in July, to be followed by the Macintosh version a month later. Both will ship with 30 fonts, including Minion Condensed, Utopia and Tekton multiple master families, and display faces including Lithos, Nueva, Willow and Critter. There will probably be a special introductory offer for the first three months of sale.

And in the news…



Those concerned with other platforms may be interested to learn than SunSoft has licensed an advanced TrueType font processor for use in its Solaris operating system.

The original TrueType processor has been modified by Bitstream to provide what it describes as a complete typographic technology solution. In other words, Solaris users will have access to the huge number of TrueType fonts available.

The almost legendary Paint Shop Pro has returned in version 4 for Windows 95. Costing £49.95 on floppy or CD, or £19.95 for an upgrade (add VAT to both prices), it will no doubt put many heavyweight and heavily-priced photo-retouching applications to shame. A full review will be published in our *First Impressions* section, soon. Contact Digital Workshop.

Registered users of PageMaker 6 for Windows should look out for version 6.01 winging its way to them. This free, updated CD includes three new plug-ins, as well as a new version of the HTML Author Plug-in, improved Kodak Precision transforms, updated PostScript printer description files and a Quark XPress document converter. This converts from XPress for Windows to PageMaker for Windows but works only under Windows 95. It will be tested during the coming months.

The AgfaType Collection 7.0 dual-platform type CD is now available free of charge from the usual font suppliers. It contains 4,300 typefaces: 500 more than version 6.0. Four libraries are featured: the original Adobe Library up to volume 405, the Agfa Type and Symbols library (over 10,000 images), and débuting on the CD format are the Cornerstone Collection and the Creative Alliance Library. The latter includes a selection of Art Parts EPS illustrations, faces from FontHaus, and more. Do get hold of a copy and check it out. But before you get too excited about getting 4,300 free typefaces, remember they're all locked until you phone for individual keys with your credit card handy.

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The digital future

On a recent trip to visit Hewlett-Packard on its home turf, many of us were surprised by one of the company's announcements. Well, more of an implication really. It was revealed that there will more than likely be a Hewlett-Packard digital camera sometime next year. The company seems obsessed with getting as many people as possible to use their PCs for photography and image manipulation.

H-P, like its competitors, is working desperately hard on producing a cheap colour inkjet printer, capable of producing photographic-quality results, by the middle of next year. These machines will not be optimised for plain paper, but the decent glossy stock we're used to handling for standard colour prints.

We were shown a video which featured the H-P family at home. The PC was, of course, the H-P Pavilion (reviewed in *First Impressions, PCW* September), which features a built-in colour scanner capable of swallowing A5-sized prints in a manner similar to an in-car CD player. Dad was using this PC to scan his favourite family snap and to electronically retouch junior's satanic red-eye.

Junior runs in and snaps Dad, with his H-P digital camera, producing an image ready to be downloaded to the PC at a later date for further fun; of course, the final result is a beautiful colour print from an H-P inkjet. The essential point is that the printout is a new and improved personalised and customised photo, but one of the same image and print quality as the original.

Stacks of prints

This is the concept that H-P and many others are trying to encourage. Take your stacks of unseen prints and customise them into something useful with your PC. Digitally remove red-eye or other unsightly blemishes, trim the shot, cut people out and paste them in new and uncompromising locations — the possibilities are endless.

The trouble is that no-one's yet built a printer which can trim the edges off a sheet of paper to produce a postcard-sized print. The solution is to encourage A4 applications. How about a calendar with your pets on it? Or a montage of holiday shots? Remember that once on your PC you can add captions, titles or a whole variety of accompanying text and graphics.

The big problem with computer imaging is the cost of the equipment with which to do it. Most computer users expect to save their files and move around them in a matter of seconds, as they're used to working with plain text or spreadsheet files. Give them a large graphics file and watch how fast they lose interest when any kind of manipulations occupy their machine for the next half a minute or so.

Those of us who work with graphics files are used to waiting a while, even on high-spec machines, but the truth is that there are loads of people out there who don't know what to expect, might have an average machine, yet quite fancy the idea of image manipulation. Short of educating them on the finer points of making a cup of tea while waiting for a Photoshop filter to finish, or upgrading their hardware to handle the load, it's up to the manufacturers to come up with a cunning plan to ensure their potential new market isn't deterred.

FLASHPIX™

Enter the new FlashPix image file format: a collaboration between Eastman Kodak, Hewlett-Packard, Microsoft and Live Picture. Kodak is familiar with trying to popularise a new image format, although PhotoCD, despite being technically excellent, failed on a few counts. The ultimate failure was the company's decision to market it both as a view-on-the-TV home format and as a professional publishing tool. It never caught on in the home, while most publishing professionals were either unhappy with the unusual colour space or unprepared for the large file sizes.

As we know, Hewlett-Packard is keen to get as many people into digital imaging as possible so that it can shift a ton of colour printers. Live Picture is involved with professional imaging and Microsoft is lending its OLE support, along with wanting to have a finger in every pie.

On the surface, FlashPix appears to share many concepts with PhotoCD. At the time of writing there were few technical details available, but here is the gist of it: FlashPix will support images of any size and resolution but, like PhotoCD, it will store each image at multiple resolutions. The clever bit is that each resolution is sub-divided into square tiles. This allows applications to load only the section of the image on which you're working, saving your computer the time and effort required to load the whole thing in one go. A fairly modest machine should be able to handle large files with speed. It's similar to how Macromedia X-Res 2 operates.

Another cunning plan is to store scripts describing the editing operations you've made separately from the image itself. In theory, this means operations performed on a low-resolution image could be applied at a later date to a larger one. It's not yet certain how scripts will be implemented, but they are said to be contained with the image data inside a "structured storage container". Microsoft's OLE Structured Storage ensures the files are compatible with existing storage architectures such as OLE II, OpenDoc, and Java and Netscape plug-ins. When opening an image, a FlashPix-savvy application will apply the script to the raw image data. The application should also select a suitable resolution on which to perform the script.

FlashPix offers three compression options: uncompressed, single-colour compression, and variable JPEG compression. It supports multiple colour spaces, which include PhotoCD's Photo YCC, a calibrated monochrome option for greyscale images, and a calibrated RGB space, entitled NIFRGB. Uncalibrated versions of these three will allow existing uncalibrated files to be converted into the FlashPix format.

If it works, FlashPix will be transparent to the end-user. The only thing they'll notice is greater speed and ease of operation. If the applications are designed properly, they'll worry about selecting the correct image resolution, while tiling and scripts ensure that modest hardware configurations aren't bogged down with processing. When it arrives later this year, FlashPix, accompanied by suitably updated applications, could open up the world of digital imaging to what the developers hope will be a huge new market.

PCW Contacts

If you fancy a chat, write to me at our Broadwick Street address, or email me as **gordon@pcw.ccmail.compuserve.com**

Fontworks 0171 490 5390

Digital Workshop 01295 258335

Battle of the **bulge**

Audio is an insatiable glutton for storage space. Panicos Georghiades and Gabriel Jacobs recommend putting it on a diet using audio compression.

Audio is important to multimedia, partly because it has a quality which few visual effects possess, especially when presented on a busy screen. It can really grab your attention. Used at the right time and in the right form, the audio element of multimedia can be very effective indeed.

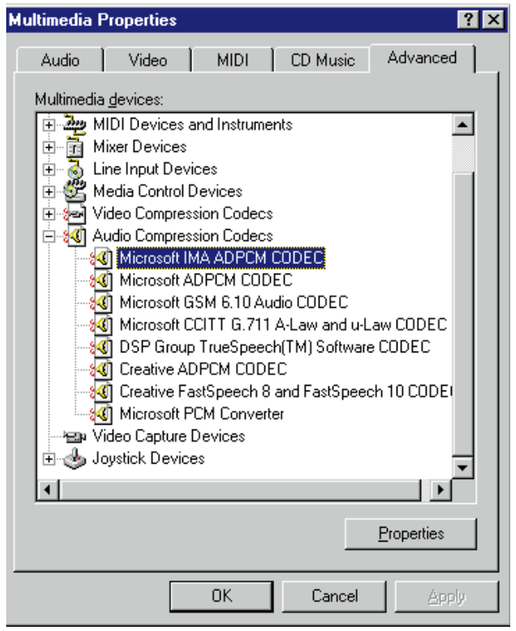
However, one of the problems of using audio is that it takes up a lot of storage space. It's the second most storage-hungry medium after video. And compression, often used with still images (GIF and JPG files) and always used with digital video in multimedia (Cinepak, Indeo, MPEG) hasn't seen such a wide use in audio.

For years we've had to suffer 11kHz 8-bit mono (so called AM-quality sound). We seem to have moved to 22kHz 8-bit stereo for multimedia on CD-ROM, but the internet is forcing a backward step with its 8Kb telephone-quality sound. With multimedia on CD-ROM, however, it's possible to enjoy CD-quality sound and use the same amount of storage space as 22kHz 8-bit sound, with compression. And any machine that can play Video for Windows, can handle it.

Part of the reason for the lack of audio compression in the early days was the use of 386 machines and basic sound cards, but the hardware situation has changed. Most users now have at least a 486, capable of audio decompression in realtime. Compression and decompression drivers have been available for free, and are installed automatically with Video for Windows. They come as standard with Windows 95.

With Windows 95 you get ADPCM, TrueSpeech, GSM 6.10 audio and CCITT G.711 (A-Law and u-Law).

With Windows 3.1 you don't get any of these, but you do have the possibility of adding audio codecs (a CODEC is a COmpressor/DECompressor) and the Video for Windows runtime module includes Microsoft and IMA ADPCM. Individual sound cards may add their own.



The Video for Windows runtime module includes Microsoft and IMA ADPCM

Compression expression

What are these things and what do they do? ADPCM (Adaptive Delta Pulse Code Modulation) comes in two flavours: IMA and Microsoft. Other companies, such as Creative Labs, have their own variations.

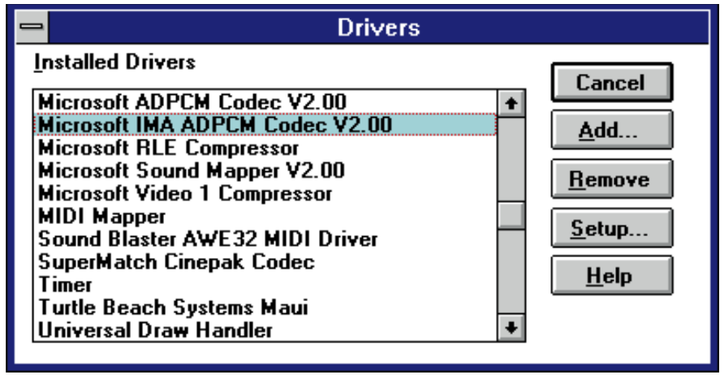
IMA stands for Interactive Multimedia Association. The definition is for multiple hardware platforms and is real-time compression.

Microsoft ADPCM is similar, but offers both real-time and non real-time compression. Non real-time compression using this method can create better-sounding audio files.

This codec is what's used in Microsoft's Encarta encyclopedia. It compresses at 4:1, and works by storing the differences between two subsequent samples rather than the value of each sample — a smaller number which can be stored in four bits instead of 16.

Although low frequencies are fairly faithfully reproduced, high frequencies can sometimes become distorted. You can hear the distortion quite plainly when the sampling rate is 11kHz, and it decreases with higher sampling rates. At 44.1kHz, you can't hear it at all if you have normal hearing. Thus, at high sampling rates, it can be used successfully for classical music, solo instruments, and good-quality speech.

CCITT G.711 A-Law and u-Law are codecs which give compatibility between telephony standards in Europe and North America. CCITT stands for Consultative Committee for International Telephone and Telegraph: it's an international organisation which creates and approves communications protocols. Its G.711 codec offers a 2:1 compression ratio by moving from 16 bits to 8 bits per sample. We don't recommend using it for multimedia.



Audio compression drivers that come with Windows 95

TrueSpeech has been developed by the DSP Group. It offers good compression (about 16:1) and is fine for certain voice applications, but it's not a good option for music, as you'll hear in our example on the CD-ROM. It doesn't give you real-time compression, but it does offer real-time *decompression* and is a viable alternative for use with modems and networks. It can certainly be used in multimedia for narration if you have too much sound and too little space.

GSM 6.10 is a good real-time compression system, if your hardware is fast enough to handle it. It's a useful codec for recording voice with the Windows Sound Recorder when you want to store sound embedded in documents, and it conforms with a standard set down by ETSI (the European Telecommunications Standards Institute).

For now, we'll leave you with these brief explanations and will return to the subject in more detail at a later date. Meanwhile, we've included various versions of an audio sample on this month's cover-mounted CD-ROM, which has been compressed using these methods, so do have a listen to it.

Not a clear picture

Another reader has sent us an interesting query to which there is no clear answer: *"Much interest is being shown in electronic still-image cameras at present. I have seen the advertisements concerning inexpensive video capture cards but I've heard that they only work for a composite signal and not for the higher-quality S-Video signal, although this may be incorrect.*

"Could you please advise how an S-Video source can be used with its higher resolution as a source for putting video clips onto the hard disk? More importantly for me, please explain the process for still electronic images. I would then try to print them at 720dpi onto special paper on an Epson Stylus Color.

"I think an answer to this question, including a comparison of the degree of resolution obtainable from an S-Video signal, vis-a-vis that obtainable from the new electronic image cameras, would be of interest to many. It might even stop the mythical estate agent rushing out to buy the new cameras if he already has a Hi-8 video camera."

James Jenkin
<jenkin@itl.net>

You're right about being wrong in what you've heard about the S-Video capabilities of capture boards. Ninety-nine percent of video capture boards on the market include an S-Video input. Also, most of them can capture stills (or single frames) and move video. So yes, as you have deduced, it's possible to get very good results from using a video camera and a capture board. However, before dismissing the usefulness of still digital cameras, there are a number of things to consider.

Most capture boards nowadays, costing £300 to £1,000, will capture a full PAL signal (most of the visible horizontal lines). The information in each line is normally digitised up to 736 times, usually using Y:U:V 4:2:2. This results in a 24-bit true colour picture. So you can end up with a captured photo-realistic image which is 736 wide x 560 high.

However, this comes from the power of the capture board and doesn't depend on whether or not you connect the camera to it

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using S-Video or composite video.

Most domestic camcorders have an estimated horizontal resolution of about 500 lines on a live signal, but still compare well with the resolution of some of the cheaper cameras working at up to 400 lines only. But when you record a camcorder signal onto tape and then play back and capture, the recording process puts on its own limitation of an estimated 400 lines (for Hi-8, S-VHS, or S-VHSC).

You also have tape-related deterioration like drop-out, noise and colour changes. In addition, the PAL signal from a camcorder is interlaced — the odd lines are not drawn at the same time as the even lines. This creates further problems often visible on stills captured while the subject is moving. Digital cameras, on the other hand, have low shutter speeds (the Casio QV10 can go as low as 1/4000 of a second). There can be synchronisation problems between the camcorder (playing a tape) and the capture board.

These are the disadvantages of using a camcorder plus capture board combination. But there are advantages. For example, the lenses and zoom facilities on most camcorders are better than those you find on cheaper digital cameras. A video tape can hold many more images than any digital-camera's floppy disk or RAM. And if you're capturing things in motion, you don't have problems with people shutting their eyes just when you click.

The main advantage of digital cameras over capture boards is not in their resolution.

Fig 1

Casio QV10	320 x 240	96 images in 2Mb RAM
Kodak DC20	493 x 373	8 images in 1Mb RAM
	320 x 240	16 images in 1Mb RAM

You can see that these resolutions are similar to those of camcorders.

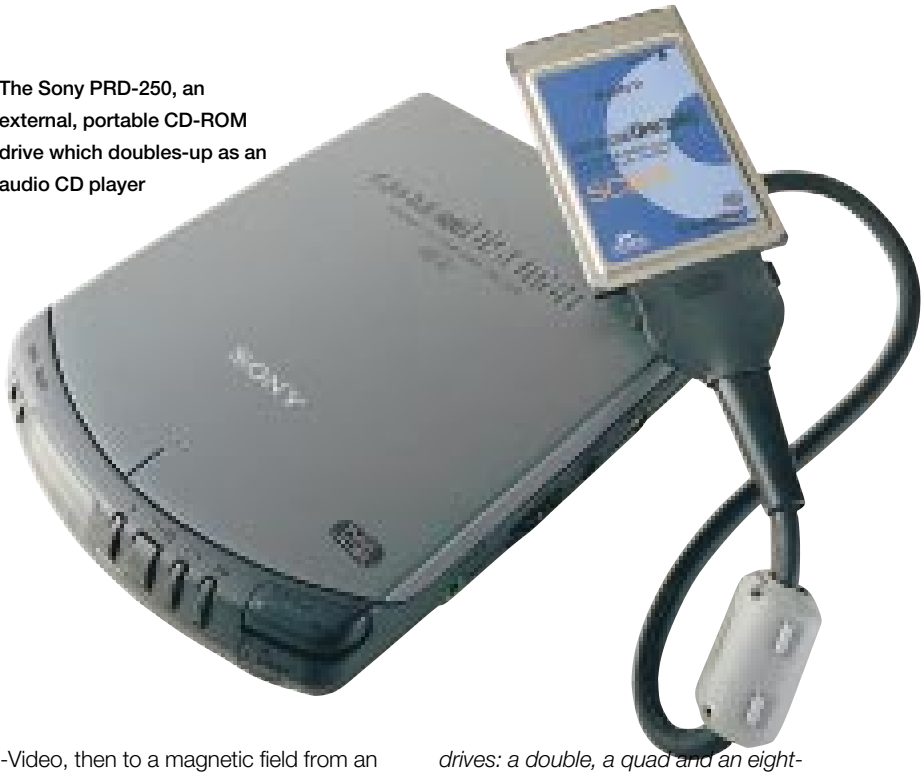
It's true that the expensive ones (£8,000-plus) can go to high resolutions, some comparable to film. But the cheaper ones (£400 to £1,000) don't have high resolutions. The table in Fig 1 illustrates the point.

Where digital cameras differ is that the signal has a shorter path (thus less processing) and is therefore truer. A signal that simply gets digitised and stored to a disk or RAM is likely to be truer to the original than one which gets converted to S-Video, then to a magnetic field from an analogue electric signal, then back to S-Video, and is then digitised by the capture board within a noisy PC environment.

As a result, images from digital cameras tend to have less spillage of colour from one pixel to another, and less noise. They give a clearer image, even if the resolution is less than that which you may get with a camcorder.

If you can avoid recording a signal onto tape when using a video camera and capture board, and you can capture from a live signal, the results obtained can be comparable, and even sometimes better than, what you can get with a cheap digital camera. This is fine, but now you have lost the portability aspect. You can now see why there's no straight answer to your question.

It's worth mentioning that the lighting on the object you're digitising will play a far greater role in the quality of the results than whether you use a digital camera or a capture board, or whether you use S-Video or composite video connections. Note also that the situation is likely to change, in favour of the camcorder and capture board combination, with the new digital camcorders now becoming available.



The Sony PRD-250, an external, portable CD-ROM drive which doubles-up as an audio CD player

CD-ROM drives and hi-fi

Reader, Lawrence Lo, writes to ask whether he can use one of his CD-ROM drives as an audio CD player. *"I have three CD-ROM drives: a double, a quad and an eight-speed. I want to take out the double-speed drive, which is a Creative Labs CDR-563. I was wondering whether it is possible to use it as an audio CD player for the hi-fi? I'm sure many other people have, like me, upgraded their CD-ROM drives. Some may still even have their old single-speed drives. Can they be used for audio?"*

Lawrence Lo
<lawrence@fusionuk.demon.co.uk>

You're not the first to have this idea, Lawrence. In fact, it's the most obvious use for an old CD-ROM drive. However, unless you have an old computer (even an 8086 with only 640Kb RAM, no hard disk, running under DOS) and an appropriate interface card (an old 8-bit SoundBlaster with a CD-ROM interface will do), you can't do it with your particular drive. This is because even though you can connect its audio output to your hi-fi, and maybe even power it externally, you'll have no control over its transport mechanism.

This is not the case with all CD-ROM drives. Some external drives, especially most of the portable ones like the new Sony PRD-250, are designed to double-up as CD players.

•PCW Contacts

If you have any multimedia-related problems, queries, hints, tips, or suggestions, write to us c/o *PCW* at the usual address, or email

g.c.jacobs@swansea.ac.uk

The **Logical** conclusion

Steven Helstrip winds up his tips on Logical Edit. There's news of the latest Logic Audio release, and there's a Chinese Candle Snuffer on the Cuckooland CD.

Last month we began to unravel the workings of Cubase's Logical Edit. So let's carry on from where we left off, digging further into Logical's Expert Mode and into some of the more advanced functions within Easy Mode. If you didn't see last month's column, we talked about the three elements of Logical Edit (Filter, Processing and Functions) and ways to utilise them. It is important to grasp how these work before moving on to more complex topics.

While on the subject of Logic, Emagic's long-awaited Logic Audio for Windows 95 has finally arrived. You can check out its main features below, or see the full review in this month's *First Impressions*.

More 'easy' Logical Edits

It is often necessary to thicken textures by doubling notes over an octave. Most do this by copying the part to another track, transposing it and then lowering its velocity. A simple Logical Edit routine can perform this task much quicker. Fig 1 shows you how.

Select the part and open Logical Edit. We're transposing notes, so the Event Type must be set to Notes. No more filters need to be set. In the processing section, value one (notes) is set to plus 12, or 24, should you want to add a part two octaves higher, and value two (velocity) is set to a minus value. If "Insert" is selected in the functions dialogue, the notes will be copied when "Do It" is clicked. If Transform is selected, the notes will not be copied, just transposed.

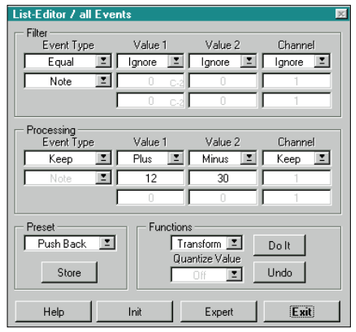


Fig 1 Logical Edit provides simple routines for transposing and changing the velocity of notes

When working with Logical Edit, it often helps to have the List Editor open in the background. This way you can see, as well as hear, the effect it is having. Set it up to delete everything, other than notes. This is quite a useful routine to store in the preset menu.

When recording complicated hi-hat or percussion tracks on a single instrument that includes 32nd notes, or demi-semi-quavers, they can be recorded on several keys and later fixed to the correct key. Fig 2 is set up to fix random notes to play back on F#1, the key for closed hi-hats. It also applies random velocity to each note but within the range 70 to 80. To copy the same pattern to, say, a tambourine, use Logic Edit as shown in Fig 1.

Expert mode

In Expert Mode, you have more parameters to play with. In the Filter section, two new fields are added, namely Length and Bar Range. The length field is very useful since it allows you, for instance, to select crotchets and convert them to minims.

You can also set up an edit to delete or copy notes above or below a certain length. Bar Range enables you to change things that occur within a given region: for example, between the first and third beats. Fig 3 is set up to copy all hi-hat events that occur after the third beat to a snare drum, key D1.

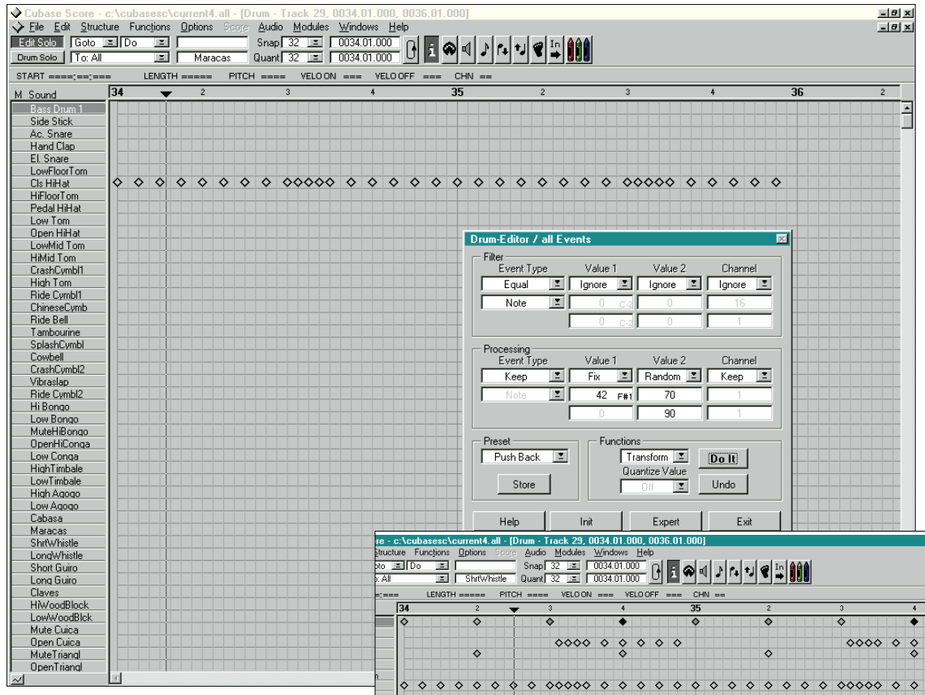
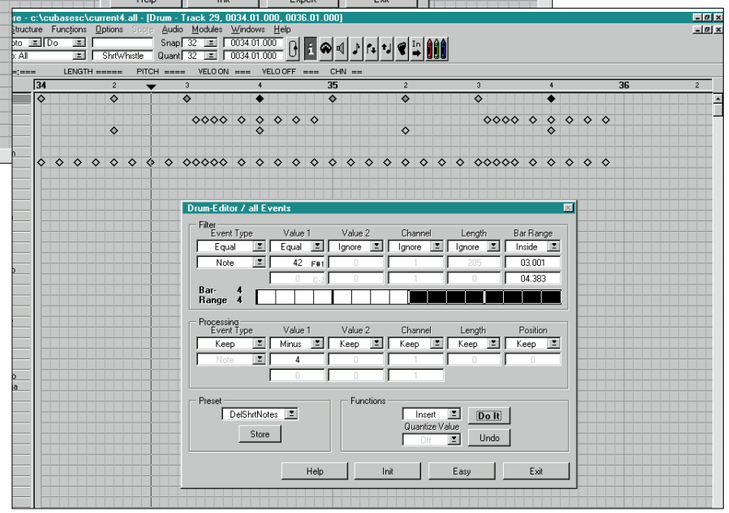


Fig 2 (left) Here, random notes are fixed so that they play back on F#1, the key for closed hi-hats

Fig 3 (below) Expert mode allows more complex edits as there are more parameters to play with



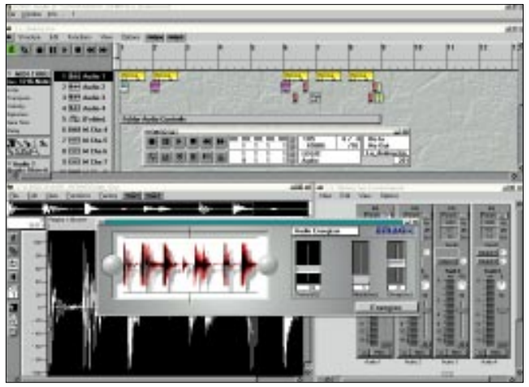
Logic Audio arrives for Win95

Logic's success on the PC hasn't been overwhelming, partly because it has always been considered an over-complex sequencer suitable for the most demanding programmer or producer. If your demands are high, and you need total integration with your studio, then it makes sense to buy a Macintosh system, simply because it has better hardware support. So, Logic is a massive success on the Mac.

This could soon change as professional hardware from the likes of Digidesign becomes available: its AudioMedia III is now shipping for the PC and provides digital-in, digital-out, stereo-analogue-in and stereo-analogue-out (£599 plus VAT). Each can be used independently and configured in various send/return combinations. Coupled with its Session software, AudioMedia III is a professional, 8-track digital workstation. The whole package costs around £900 (plus VAT).

The latest release of Logic supports AudioMedia hardware and enables environments to be set up to control audio mixing, including EQ settings. All mixes can be automated and edited as MIDI messages in the Hyper Editor. Logic is the first Win95 enhanced sequencer, so at last you can save your songs with long filenames. All audio processing is 32-bit, which means you don't have to wait a lifetime just to normalise a take. You can also process audio parts as they are playing.

Logic Audio is still a complex package, although overall navigation has been made easier. You'll still need to invest a lot of time getting to know the package. It's a bit like chess in that it only takes a few hours to grasp the basic principles, but it could take many years to master. If you have the time, and need, for what is probably the most advanced sequencer around, Logic is worth the investment.



Here's the latest version of Logic Audio, in full 32-bit glory

Zero-G Cuckooland Vol.1 - Unhinged

This is one remarkable CD. Its title doesn't give much away, but suggests it may be a little on the strange side. To be honest, it's a lot on the strange side, but that's what makes it so interesting. The first track contains 98 seconds of assorted madness. Madness that is described as "Gravel Brass", "Chinese Candle Snuffer" and "Difficult To Describe". Difficult to describe it may be, but it's fun to listen to and easy to incorporate within ambient and trancy tunes. If you're looking for textures and loops for use in film or games, there's plenty on this CD to get excited about.

Tracks two to 82 contain hundreds of out-of-the-ordinary loops. Some are percussion-based while others are natural ambiences saturated with effects. The rest are impossible to describe. Artistes that come to mind, though, include Leftfield, Massive Attack and Art Of Noise. Many of the tracks are compositions in their own right. When you buy this CD, you license its contents for use in commercial and non-commercial music.

Tracks 83 through to 98 contain musical "one shot" samples. There are basses, snares, kicks and assorted industrial sounds. There's even a sample of a cat on Mars… how very strange. Cuckooland costs just under £60 (incl. VAT), which is a lot to shell out, but it's money well spent if you're looking for something different to spice up your tunes.

Cuckooland is distributed by Time + Space *(see page 311)* and a free 72-page catalogue is available from them, featuring hundreds of CDs and CD-ROMs.

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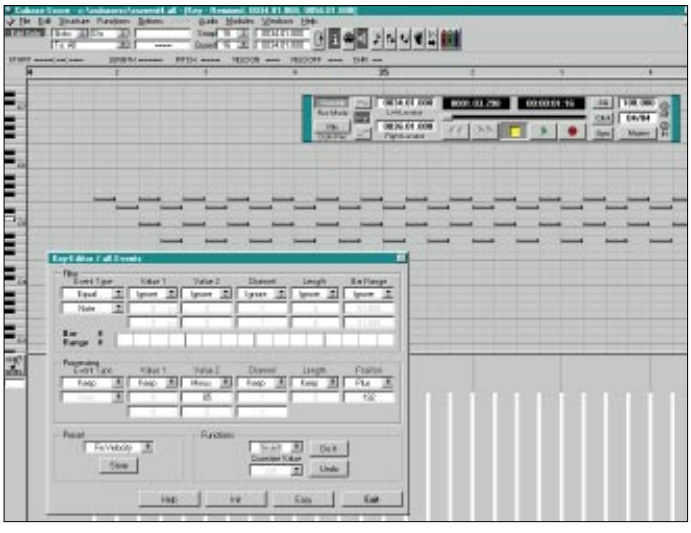


Fig 4 Here, an echo effect is created by setting a delay on the synth line

Expert Mode provides more parameters in the Processing section along with three extra Operators. These include Invert, which inverts events, given that value 64 is the axis. Small values become large, and vice-versa. ScaleMap makes notes fit within a given scale, and Flip, which behaves similarly to Invert, allows you to set your own axis.

Fig 4 is set up to create an echo effect. The synth line will repeat an eighth later, with a lower velocity. You can experiment with different delay lengths given that each semi-quaver equals 96 ticks, or points.

•PCW Contacts

If you have any hints or tips, MIDI-related items or general comments, send them to the usual *PCW* address, or to **steven_helstrip@pcw.ccmail.compuserve.com**

AudioMedia 01753 653322

Digidesign 01753 653322

Sound Technology (Logic Audio) 01462 480000

Time + Space (Cuckooland vol. 1) 01442 870681

Helstrip helps out…

Q *"I'm a DJ who uses CDs. This causes me two problems, as I'm a chart returner who is sent a lot of promo records weeks before commercial release, and occasionally the tracks I want to play either aren't released or aren't available on CD.*

My PC is a Pentium 90 with 16Mb of RAM running Windows 95. I have a Creative Labs SoundBlaster 16 card and a HP4020i CD writer. I have been sampling-in my favourite promo tracks into the PC at the full 44.1kHz, 16-bit quality, and writing the .wav files to CD using the Easy CD Audio software, thus creating a mini promo EP each week to use over the weekend. My Denon DN2700F CD player has no problems reading the CDRs, and will perform all the usual functions on them like looping and sampling.

I use the Creative Wave Studio supplied with the sound card to edit certain tracks to make them more DJ-friendly, and the Easy CD Audio software will allow me to convert a track from CD directly to a .wav file, thus keeping the full digital quality of the track.

I am interested in purchasing a more advanced sound editor and I want it to be able to perform the following functions. Firstly, to perform high-quality time-stretching. I have downloaded a demo copy of Steinberg's Wavelab from the internet and this will indeed do this on a full track with good-quality results.

Secondly, I want to be able to strip out the background noise from my sampled tracks. This noise would include the needle in the record, on the vinyl, any noise from my Citronic mixer and any from my sound card. The sampled CDs actually sound okay in the club, certainly no worse than playing the vinyl, but you can tell when a fully digital CD is played. I can't seem to find software that will fulfil this function, although I am certain it must exist."

Andy Elvers (wooski@dircon.co.uk)

A WaveLab is probably your best bet for time-stretching and editing samples in general. Because it's written in 32-bit code it's extremely fast, and version 1.5, to be released around August/September time, will support real-time plug-in modules. Several modules will ship with the package, including a Delay generator, Chorus, Auto-panner, EQ and a Leveller.

Once registered, users will receive a Reverb module free of charge. Optional plug-ins will include a De-noiser and De-clicker, which are perfect for re-mastering and removing unwanted vinyl crackles.

Another move worth considering might be to upgrade your sound card to, say, a Turtle Beach Tropez. Because it has a greater signal-to-noise ratio, your recording will inherit less hiss. The playback quality will be cleaner, too.

Into the **Visual Age**

Tim Anderson looks at IBM's plans for VisualAge Basic, finds a new visual implementation of Prolog, and introduces new sections for Visual Basic and Delphi.

All programming is visual now. The quick riposte is that most programming tools are resolutely procedural with an array of visual tools to disguise the fact. But there's no doubt that the likes of Visual Basic and Delphi have won the argument about how to program. That leaves a difficult choice for a column like this one. With so many visual tools out there, should it become a pot-pourri of miscellaneous programming news and tips? Or should it revert to being product specific, dedicated to Visual Basic which remains the most popular Windows development tool? A further complication is that third-party components in the form of VBX or OCX/ActiveX controls can be hosted by a variety of different programming tools.

In response, Visual Programming Hands On has been expanded and will be divided into three parts. The first will cover visual programming generally, including components that are useful in a wide range of products. The other two sections will cover Visual Basic and Delphi respectively, so that users of the two most popular general-purpose visual languages will always find something specifically for them. Much of the material in this column is a direct response to your comments and queries, so please keep them coming to me, by email or at the usual *PCW* address.

IBM's new BASIC

At the time of writing, IBM is in open beta with its version of Basic, an addition to the VisualAge product family. The press release refers superciliously to Basic as a "scripting language", but nevertheless IBM's release is a great testimony to VB's influence. The final release date has not been announced, but will be before the end of the year. It is a cross-platform product, with versions initially available for OS/2 and Windows NT. Windows 95 compatibility will follow, and it will be possible to deploy Visual Age for Basic applications on AIX.

With Visual Age for Basic, IBM seems to have several goals in mind. One is to make OS/2 a more appealing platform, by introducing an enormously popular language and making it easy to convert existing Visual Basic applications. It is also part of IBM's attempt to establish its preferred object model, SOM, on the Windows platform. Visual Age for Basic will support SOM, OpenDoc and OCX. Finally, it is a tool for IBM's DB2 database, with integrated access using embedded SQL and the ability to create stored procedures and user-defined functions.

As a DB2 add-on or an OS/2 utility, Visual Age Basic looks likely to succeed, but whether it will challenge Visual Basic itself on the Windows platform looks more doubtful. Judging by the beta, system demands are as high or higher, with 24Mb RAM recommended for development. Like VB 4.0, it is an interpreted language and unlikely to win on performance. It is broadly compatible with Visual Basic, but that compatibility does not extend to data access code. On the plus side, IBM promises a proper implementation of inheritance and, should SOM catch on, Visual Age Basic will be very useful. Look out for a full review in due course.

Visual Prolog

Back in the seventies, a partnership between two Frenchmen, one a computer scientist and one a logician, produced a new language called Prolog (short for Programming in Logic). Unlike procedural languages, which give step-by-step instructions to the computer, Prolog does problem solving by inference and recursion. To give you a flavour, here's a complete program that looks up a telephone number:

```
PREDICATES
nondeterm tel_no(symbol,symbol)

CLAUSES
tel_no("Bill","0123 4567").
tel_no("Jane","0765 4321").

GOAL
tel_no("Jane", Number).

In this case the output is:

Number=0765 4321
1 solution
```

Prolog's particular strength is in artificial intelligence and expert systems. It would be a good choice for an application that assessed insurance risks or for a program to create timetables for schools, trains or airlines. In the late eighties, Prolog was marketed by Borland as Turbo Prolog, following which rights reverted to the Prolog Development Center (PDC). PDC has now come up with Visual Prolog, a graphical development environment for Windows (16 and 32-bit) and in due course for OS/2. Visual Prolog includes layout editors and Code Experts, which allow you to create a graphical interface by using drawing tools and responding to dialogs. It works by means of a set of Prolog extensions called the Visual Programming Interface, a framework for controlling a graphical interface.

PDC argues that Prolog's clarity and efficiency makes it not only a tool for building expert systems, but a challenge to more popular products like Delphi and Visual Basic. It compiles to native executables and performance is impressive. ODBC is supported for database work. A particularly nice feature is the integrated help authoring system, which makes it easy to create and edit online help from within the development environment. Nevertheless, the unfamiliar language combined with lack of support for VBX or OCX components, or OLE in any form, will ensure that Visual Prolog remains a niche product. For projects which lend themselves to a Prolog implementation, though, Visual Prolog is mightily impressive.

Visual Basic

Trouble with menus

VB programmer Ian Moss writes with a menu problem. "*I can add and remove items from indexed menus, no problem. What I want to do is create menus that have submenus. I am adding menu items that are divisions of a basketball league. Each division has teams associated with it. I read the division names from a database, and create the correct number of menu items. I want each division menu to have a sub menu containing the teams in that division.*"

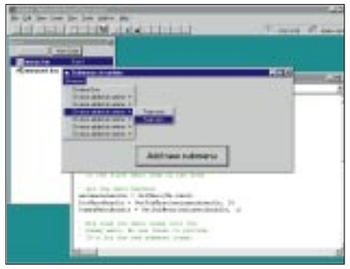
Here is a classic Visual Basic problem. Ian needs to create menus that have submenus, at runtime. VB's menu editor is a doddle to use. Creating menu items at runtime is easy using a control array and the Load command. But creating submenus at runtime is not in the book. It can be done, but only by trickery. It is another reason why serious VB programmers need Daniel Appleman's book, *Visual Basic Progammer's guide to the Windows API* (see review).

Using the Windows API, you can modify and add to the menus in a VB application.

Fig 1 VB Tip: Creating submenus at runtime

For this routine to work, you will need to use the VB menu editor to create a menu with two toplevel items. The first (Divisions) must have at least one sub-item, to make it a pop-up menu in API terms. The second (Dummy) must also have a sub-item, with an index value set, to make it a control array. I've named this mnuDummyArray. Finally, give the second toplevel item an empty string for a caption, and an enabled property of False. The user will never see the dummy menu.

Several API functions are included and these must be declared. The code below is for 32-bit Visual Basic, but with small amendments will work in 16-bit as well. Code to respond to clicks on the new menu items should be placed in the mnuDummyArray_Click event, using the Index parameter to detect which one was chosen.



You can create VB submenus at runtime, with a little help from the Windows API

```
Private Sub Command1 Click()

Dim mainmenuhandle As Long
Dim DivMenuHandle As Long
Dim DummyMenuHandle As Long
Dim NewMenuHandle As Long

Dim lRetVal As Long
Dim spareID As Long
Dim iCount As Integer

‘ this routine appends a new submenu
‘ to the first menu on the form

‘ get the menu handles
mainmenuhandle = GetMenu(Me.hwnd)
DivMenuHandle = GetSubMenu(mainmenuhandle, 0)
DummyMenuHandle = GetSubMenu(mainmenuhandle, 1)

‘ Now load two menu items into the
‘ dummy menu. We use these to provide
‘ ID’s for the new submenu items.

‘ count the existing items in the dummy submenu
iCount = GetMenuItemCount(DummyMenuHandle)

‘ load two new ones
Load Me!mnuDummyArray(iCount)
Me!mnuDummyArray(iCount).Caption = “Team one”

Load Me!mnuDummyArray(iCount + 1)
Me!mnuDummyArray(iCount + 1).Caption = “Team two”

‘ Create the new submenu
NewMenuHandle = CreatePopupMenu()

‘ Add two items to the submenu
spareID = GetMenuItemID(DummyMenuHandle, iCount)
lRetVal = AppendMenu(NewMenuHandle, MF ENABLED Or
MF STRING, spareID, “Team one”)

spareID = GetMenuItemID(DummyMenuHandle, iCount + 1)
lRetVal = AppendMenu(NewMenuHandle, MF ENABLED Or
MF STRING, spareID, “Team two”)

‘ Append the new submenu
lRetVal = AppendMenu(DivMenuHandle, MF ENABLED Or
MF POPUP, NewMenuHandle, “Division added at runtime”)

End Sub
```

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An entry with a submenu is not a normal menu item, but the top level of a pop-up menu, so you use the CreatePopupMenu function to return a handle to a new pop-up menu. Then AppendMenu is used both to add items to the submenu, and finally to add the pop-up menu to the existing menu structure.

The new menu will look pretty, but won't execute any code without further work. The problem is that VB creates menus with a two-stage process. When you design a menu, or change menu properties with VB code, you interact with an internal VB menu object. Visual Basic uses this internal object to generate the correct API calls that make the menu work. If you call the API directly, bypassing the internal VB object, VB doesn't know about the changes you have made.

When you click on a menu item, Windows sends a WM_COMMAND message to the application which includes a menu ID. This ID identifies the menu item, enabling the correct code to be executed. If you add a menu item using the API, VB will not recognise the ID, so the message sent when that item is clicked is ignored.

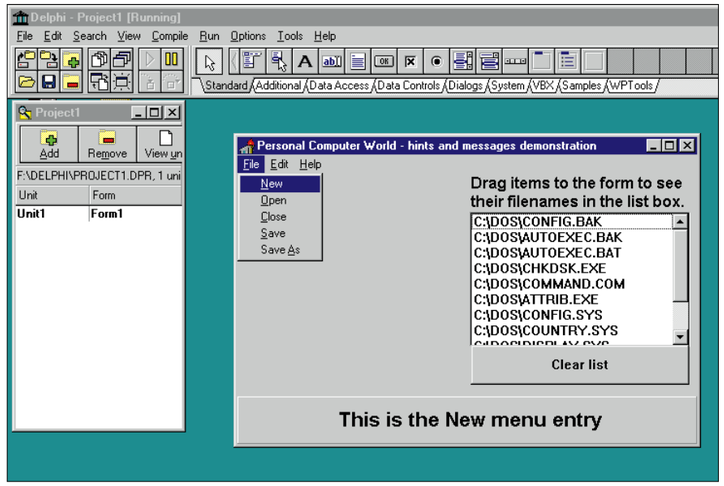
The workaround is to set up a dummy menu, where the toplevel item is disabled and has no caption, and which contains a control array. Note that the visible property must be True, otherwise the following tip will not work. When you need to add a menu item using the API, your code must first add an item to this control array. Then you can steal the ID for the new menu item, using the API call GetMenuItemID, and use it to create the new API menu item. When the user clicks on the menu you have created, VB is tricked into thinking that the item in the dummy menu has been selected, and will execute code in its click event. Fig 1 contains example code.

I must emphasise that this procedure is only necessary if you must create new submenus at runtime. Adding items to an existing menu or submenu is no problem. Another possibility is to create all your submenus at design time, and set their visible property to false, so that your code can reveal them as required. Finally, why not rethink the user interface completely? Ian's example application might be better served by an outline control, displaying divisions and teams in a tree view.

DELPHI

Delphi Gets the Message

One great thing about working with Delphi is how easy it is to trap Windows messages. Just to recap, much of Windows functionality is a result of system messages being sent to individual windows. For example, moving the mouse sends a WM_MOUSEMOVE message to a window.

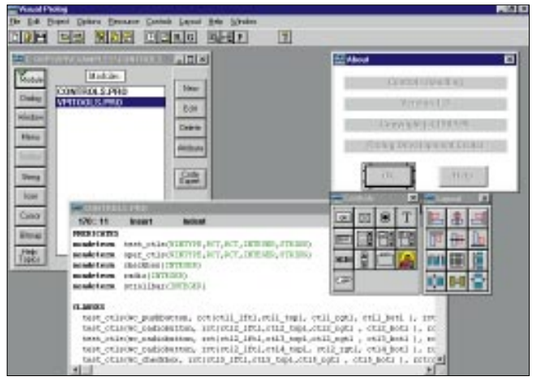


All done with messages: this Delphi application displays hints for the System menu, and accepts drag-and-drop files from Explorer or File Manager

Visual Basic Programmer's Guide to the Win32 API

Noted VB guru Daniel Appleman has issued an update to his popular API guide for Visual Basic users. This is no cursory update. The book has expanded by 500 pages and is more brick-like than ever. Even so, the author apologises for not including every Win32 API function. It is not his fault as the API is now so huge that to include everything would have made the book unmanageable. He correctly observes that once you know how the API ticks, it is not too hard to learn new functions and call them from VB.

Most serious Visual Basic developers will want this book. It accomplishes two things. First, it documents most API functions from a VB perspective, giving the correct declaration and explaining the particular benefits and pitfalls of each one. Second, there is masses on information on how Windows hangs together, including such topics as window handles, messages, co-ordinate systems and memory management. There's no other book like it, and Appleman does the job well.



Visual Prolog combines the Prolog language with a capable set of visual tools

I do have one nagging doubt, and that is why we need this book when Visual Basic should be powerful enough without it. The truth is, the deeper you get into the API from VB, the stronger the case for switching to a more suitable language such as C++ or Delphi. To get the best from VB, you need to be using it mostly within its natural limits, otherwise the benefits of RAD disappear under an avalanche of obscure code. The answer is to use this stuff with discretion, to solve problems that would otherwise leave you stalled. One example is optimisation. For instance, Appleman demonstrates a routine for searching listboxes that is five times faster than pure VB code. For users of your application that could make all the difference.

Sending, trapping, and creating custom messages are excellent techniques for creating powerful and flexible applications.

As an example, here's a couple of tips from Ian Briscoe (thanks for the tips, Ian - a book token is on its way). The first is for displaying hints for the System menu. The system menu does not appear in Delphi's menu editor, but you can still display hints by trapping the WM_MENUSELECT message. In the private section of a form declaration, add the following:

```
procedure SysMenuHint (var Message:
TWMMenuSelect); message
WM_MENUSELECT;
```

Note the message directive at the end of the declaration that tells Delphi this is a message handler. Fig 2 is the code for the procedure.

Ian adds, "Note that the menu selected is not the System menu. We call the inherited menu handler to allow Delphi to add its own hint functionality. We don't set the caption of the panel directly, but go through Delphi's own methods to display the hint, allowing you to still catch the OnHint event to add any additional coding."

The second tip is for trapping a drag-and-drop message from File Manager or Explorer. This is a neat trick that enables users to drag files into your application, for example to open documents in a text editor. First, add ShellAPI to the uses clause of the main form. Then declare the following message handler:

```
Procedure DragDrop (var Message:
TWMDropFiles); message
WM_DROPFILES;
```

Now in the FormCreate procedure add:

```
DragAcceptFiles(Form1.Handle,
True);
```

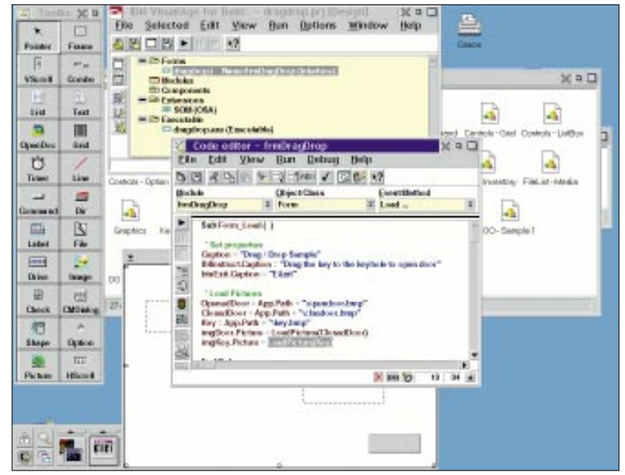
Fig 3 is the code for the DragDrop procedure. This example just displays the filenames in a listbox, but your code can do whatever you want with the files.

•PCW Contacts

Tim Anderson welcomes your Visual Programming comments and tips. He can be contacted at the usual *PCW* address or at **freer@cix.compulink.co.uk**, or **http://www.compulink.co.uk/~tim-anderson/**

Visual Basic Programmers' Guide to the Win32 API is by Daniel Appleman. ISBN 1-56276-287-7. £46.99. Contact Prentice Hall, Tel. 01442 881900

Visual Prolog costs £477 from PDC UK, Tel. 01603 611291



VisualAge Basic brings easy application development to OS/2 at last

Fig 2 Code for message handler

```
procedure TForm1.SysMenuHint (var Message: TWMMenuSelect);
begin
if (Message.MenuFlag and MF_SYSMENU) = MF_SYSMENU then
begin
case Message.IDItem of
0: Application.Hint := '';
SC_CLOSE:
Application.Hint := 'Closes the window and quits the application';
SC_MAXIMIZE:
Application.Hint := 'Expands the windows to fill the screen';
{...etc. Look up the constants in WINAPI.HLP under WM_SYSCOMMAND}
else
Application.Hint := '';
end;
Message.Result := 0;
end
else
inherited;
end;
```

Fig 3 DragDrop code

```
procedure TForm1.DragDrop(var Message: TWMDropFiles);
var
i, numfiles: integer;
lpzFileName: PChar;
begin
numfiles := DragQueryFile(Message.Drop,Word(-1),nil,0);
ListBox1.Items.BeginUpdate;
lpzFileName := strAlloc(101);
for i := 0 to numfiles do
    begin
    strPCopy(lpzFilename,'');
    DragQueryfile (Message.Drop,i,lpzFileName,100);
    ListBox1.Items.Add (StrPas(lpzFileName));
    end;
strDispose(lpzFileName);
ListBox1.Items.EndUpdate;
DragFinish(Message.Drop);
Message.Result := 0;
end;
```

Colour-fast

What could possibly tempt Stephen Rodda to dig out his cheque book? Cheap to run and a joy to own, HP's Colour LaserJet hit the right spot.

Regular readers will know that I'm always after a better, bigger and faster colour printer. This month I've had a Hewlett-Packard Colour LaserJet 5M (CLJ5) to play with, and by golly it's a beauty.

It's not as technically perfect as a Kodak Colorease PS which I also played with last year, but it is faster. And cheaper. And the consumables are cheaper. In fact, it costs slightly less to produce a full-colour print on plain paper on a CLJ5 than a monochrome print on a LaserJet 4 Plus. That's cheap. Just compare the running costs of the Colorease PS at about £2 per print with the output costs of the CLJ5 which are fractions of a penny or, if you really want to push the boat out and use H-P's own special paper, about 10p.

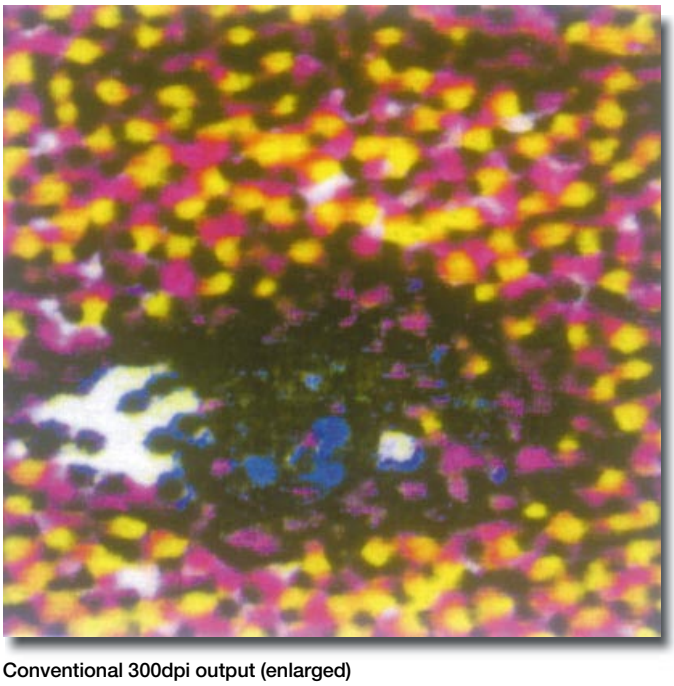
The printer uses a newly-developed version of the H-P RET (Resolution Enhancement Technology) to make 300dpi look as good as 1,200dpi. And H-P has succeeded: I've got a blown-up picture of a portion of output done on two different machines. The first is a scan of a conventionally-produced 300dpi print and the second is the same, but with RET.

The printer prints A4 in colour or A3 in monochrome. Why the size difference? The colour picture is laid down on the drum only and then transferred to the paper in a single shot. This makes registration of all the colours perfect, since there's no fussing about getting the paper in exactly the correct place four times in succession.

Why am I talking about a printer in a networking column? Because this one is a networked print server. Being connected by means of a JetDirect card, it can be shared across the whole LAN as a joint resource. I tested it with nearly all the networking protocols it supported.

At first, of course, it appeared on the AppleTalk network a few moments after it was switched on. Then, spoilt for choice, I decided to have a look for the printer on the NT Server. Naturally, the AppleTalk server was easily visible. "What of the other protocols?" I wondered. I installed the DLC protocol and saw the printer directly.

Next I tried "lpr" (Unix printing capability). Setting the printer to a static IP address, as



Conventional 300dpi output (enlarged)

Resolution enhanced 300dpi output to 1200dpi (enlarged)

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"Readers' wives" husbands' desktops

"Here's a useful tip. It is possible to connect to NT FTP Servers over the internet using Windows 95 as if they were network drives within My Computer.

To connect to Microsoft's FTP Server, edit LMHOSTS (in the \WINDOWS directory) to read

```
198.105.232.1        ftp        #PRE
```

Save the file, make sure you are connected to the internet, and from the MSDOS prompt (while running Win95 of course) type

```
nbtstat -R
```

(case is important). You should get a message saying everything is OK. You can now right-click on My Computer (or Network Neighbourhood) and select "Map Network Drive"; type

```
\\FTP\DATA
```

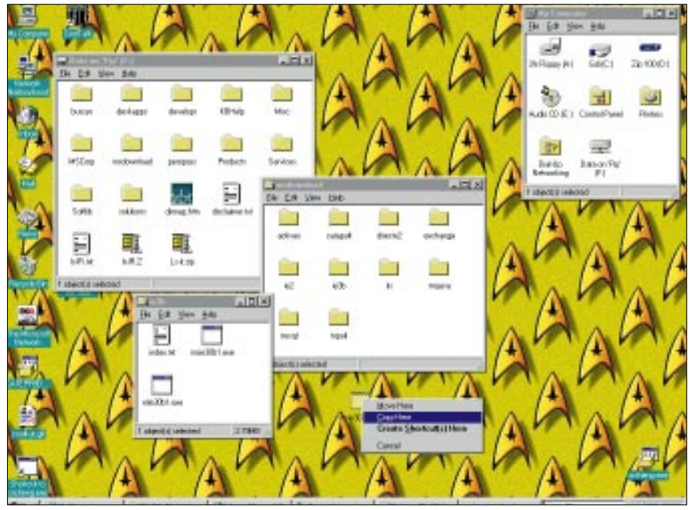
in the path box and select OK. If all is well after a couple of seconds, you should see a new drive appear in My Computer and an Explorer window will appear on the desktop just like a normal network drive.

You can now copy files from Microsoft by simply dragging files to the desktop (or any folder you like). I don't know if it's just coincidence, but file transfers seem faster to me. Included is a picture of my own desktop connected to Microsoft in the manner I have described."

Paul Fitzgibbon
<paulf@spoonnet.demon.co.uk>

Thank you, Paul, for the picture of your desktop (shown here) with the MS ftp site mounted on your computer as another drive. Just as a word of warning to other readers, though: I should point out that Paul isn't strictly correct about the requirement for an NT server, since all that is required is a server supporting NETBIOS over TCP/IP. An NT server with NETBIOS turned off won't work in this manner, but a Linux server with NETBIOS turned on and using (say) Samba will. I believe this is the only ftp server which has this capability, but please contact me if you know of others.

Colour schemes such as this shouldn't be attempted by the inexperienced or without an adult present, and I am definitely not going to publish a series of pictures of "Readers' wives" husbands' desktops — unless I can be convinced otherwise.



Paul Fitzgibbon's brightly-coloured desktop showing his attachment to the Microsoft ftp site

my TCP/IP network is too small to bother with having a bootup (automatic address allocation) server, I sent a job to the address where the printer was installed (10.0.0.10) and the page printed as I would have expected. Incidentally, I use 10.x.x.x in my network, as this address will not propagate across the internet. Whichever machine is accessing the internet acts as a sort of low-class firewall, since I haven't enabled internet-routing across my own network.

Next, I tried to use the Novell Print Server capability of the JetDirect card. For some reason, I failed to do it. I believe it was my own failure rather than that of the card, as I remember some strange incantation I had to make the last time I used a JetDirect card on a Novell NetWare network. Unfortunately, the relevant grimoire wasn't to hand.

Under Windows

So far, so good. So next I tried it under Windows 95 and Windows 3.11. Windows 95 wasn't the easiest operating system to use in order to find the printer. I tried installing DLC as a protocol, and the network failed to see the printer at all.

This was a fault with Microsoft's Windows 95 DLC rather than with the printer since NT saw the printer without hesitation. I thought I'd try using TCP/IP printing. Never having installed an lpr-like printer server under Windows 95, I was somewhat at a loss. I ended up sharing the AppleTalk protocol through NetWare, which is exactly the strategy I adopted under Windows 3.11 as well, since I wasn't even prepared to try what didn't work under 95.

I was disappointed only on one count, and this is really only a minor niggle. I feel that since H-P has virtually led the world in pioneering 100MHz networking with 100baseVG, it might have been a good idea to include the technology on the JetDirect card, especially when you consider that colour reproduction can require up to four times the information that monochrome needs. What effect does that have on me? Just the fact that transferring what could sometimes amount to 32Mb of information to print out one A4 sheet would obviously be better over a network running ten times faster than the norm.

Overall, the printer performed beautifully. But I would have liked to have seen the manual-feed adaptor included as part of the standard package, which also allows a straight-through paper path. As the printer stands, it will accept thinnish card through the standard feed, although I assume the manual feed would allow thicker stock to be used.

I printed out a few sheets of coated art paper, but sometimes the toner preferred to temporarily stick to the fuser roller rather than the paper. I think this was rather more to do with the fact that I had selected the face-down output option, sending the paper through another 180° turn just after the fuse, instead of the face-up option which I could have selected instead.

All in all, the Colour LaserJet 5M is a smashing printer, and those of you who have read my previous columns will know that my partner, Jeff, who is a graphic designer, has also placed his seal of approval on it. This is one machine I shall be sorry to see the back of. In fact, where's my cheque book?

Just another manic mailbox

As ever, I have had a hectic time with my mailbox, and the following letters represent a cross-section of the queries, suggestions and complaints I get.

There is a new variety of email which I have come across recently, and that is the anonymous sort. Actually, I haven't had any insulting mail, just a friendly note, but whoever it was hadn't got their mailer set up with their correct domain name. So, if you're reading this, "davem@freight", I suggest you check out your mailer configuration.

A share for all

*"I note with interest your response to Keith Rowe [*PCW *August], especially in relation to modem sharing. I am currently investigating sharing a modem on a mixed network (NT Server 3.51, Windows 95, NT Workstation 3.51 and 4.0, WFW 3.11 and a Novell Server).*

We have the modem connected to the NT Server, which we have configured as an intranet with dial-in facilities, and we would like to share the modem available for most users.

We have a fax server running on a WFW 3.11 with multi-com software, but with the quantity of faxes, we feel the second modem would be better utilised for

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outgoing modem use.

We were led to believe by Microsoft that modem sharing was available, but cannot find a way of doing this and are trying to find a third-party solution which caters for most of the above clients."

Glen Worrall

Basically, I think you're looking at two different requirements for modem sharing. The first would be an internet connection which anyone could use over the network, and the second would perhaps be an outgoing fax connection.

I suggest you try Winport and Faxport from lansource@cix.compulink.co.uk. I gather there's now a demonstration version so that you may assess the software's features on your own network.

Lining up a Linux server

*"I was reading your response to a letter by Keith Rowe (*PCW *August), and I have a question about setting up a Linux File Server. At the moment, I have a small network of Pentiums (all P75, apart from one P100, all with 8Mb RAM) using Windows 95 as a peer-to-peer network operating system.*

The network is used for file and printer sharing between various computers in different parts of the office. I am thinking of getting a file server, so instead of moving the backup drive from machine to machine at the end of the day, we could store all data on one server and just back that up. I am interested in having a Linux server as it is a lot cheaper than Windows NT, but I do have a few questions.

In the first place, I was wondering if I could carry on using the network for printer-sharing because with all the files being on the server, we would no longer need to transfer them from machine to machine.

Secondly, could I continue with the current BNC wiring and connectors we are using? Could I use an H-P Colorado T1000e drive on a Linux server?

And lastly, could we carry on using Windows 95 to access the server, or would we need to invest in extra software?"

Jonathan Friend <jonathan@friendco.demon.co.uk>

Your first question is easily answered. Yes, even though you use a Linux machine as a server, you can still run Windows for Workgroups or Windows 95's own printer sharing over the network. So is the second question: it's a resounding yes on that one, too.

The reason behind this is that although you may be changing the type of packet and the protocol which is sent around the network, these packets and protocols can coexist with other packets on the same bit of cabling. My own small network uses Novell's IPX, TCP/IP, MS NETBEUI, HP DLC and AppleTalk at more or less the same time.

Linux has built-in support for the H-P Colorado drives. Windows 95 can be used perfectly well to access a Linux server. There is, however, a variety of ways in which you can do this. The methods range from using rather crude ftp services which are built into Linux to transfer files from the server's hard disk to a local hard disk, to installing a networking server-type package on the Linux machine.

Most of these server packages are free, so don't worry. You can use one of three I am considering (although I'll probably get floods of mail, telling me about a fourth, fifth or even a sixth option). These are NFS (Sun's own file-server protocol for the Linux box), Samba, which pretends to be an NT server on the network, and a NetWare-alike server package.

I'll treat you to my own set of prejudices as to which I feel you should install, so remember they are really personal and not to be messed with.

NFS is slower than Samba and requires that you load a separate client under 95, thereby taking up extra memory on the workstations. The NetWare-alike server is in beta test and also requires you to load another protocol. Samba has been in use in various production environments and has proved its stability. It simply runs under TCP/IP with NETBIOS.

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Feel the **force**

Howard Oakley is reeling from the power of his new Mac, but installing OS8 brings him back to earth.

Although Apple's troubles are not trivial, it is all too easy to relegate the company to the edge of bankruptcy. That august organ of corporate America, *The Wall Street Journal*, recently published a correction to its report that sales in the final quarter of 1995 were 11 percent down on those of a year before. The truth is that Apple's sales had *risen* by 11 percent.

However, all in the orchard is not rosy, and Gil Amelio still has many problems to solve before he can declare that the trees are laden with fruit once again.

All change

Another story used to spread gloom is the departure of two of Apple's luminaries. Steve Capps was a principal architect of the Finder, and had a major influence on much of the Mac/human interface. More recently, he was a key member of the Newton team and his contributions to both areas will be sadly missed. Walter Smith, who gave his name to WallyScript (alias NewtonScript), saved the Newton project from foundering on the rocks of Dylan: this latter would have been the new language for the Newton but was scrapped at the last minute. Smith implemented a derivative of the little-known language called "self", and breathed life into the Newton.

While Steve and Walter are a loss to Apple and a gain to Microsoft's adolescent internet division, such movements are common and frequent. For every Capps and Smith, there are a dozen bright young people vying to succeed them as Apple heroes.

Meanwhile, Apple has been wooing developers like never before. In spite of anything you may hear to the contrary about Apple's business, it has been attracting new programmers in droves. Many appear to be dyed-in-the-wool Windows-wrights, who have completed the move to Win32 and are trawling for fresh markets. Apple's new regime has made Guy Kawasaki (eclectic evangelist, father of the 4th Dimension database and, more recently, Claris eMailer) an Apple Fellow responsible for liaising with developers. It has put Heidi Roizen, past president of T/Maker and vendor of WriteNow, in charge of developer relations. Inventory surpluses have been turned to advantage by selling them off to registered developers, enticing them with bargains.

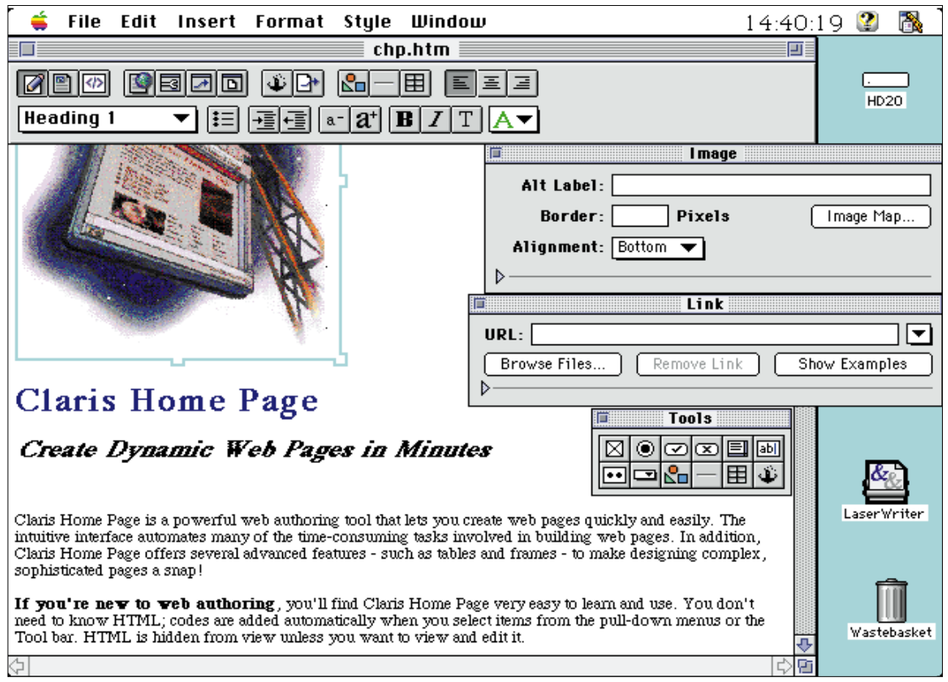

Fig 1 In a bold move, Claris not only announced its new web authoring application, Home Page, but made time-limited beta versions available on the internet. Offering tools as easy as those in ClarisWorks, it looks ideal for constructing small to medium-sized sites. A Windows version is promised later in the year

Power crazy

The upshot of Apple's generosity is that I am now the proud owner of a Power Mac 9500/132, which has quickly become my main development system. It arrived with a 16Mb memory, so my first task was to add two 32Mb DIMMs to bring it up to 80Mb in total.

Having languished for two years with an otherwise delightful 16Mb Power Mac 6100, I decided that the savings in the cost of the base unit should be invested in hardware resources. I also wanted to use the internal SCSI chain by adding a 4Gb hard disk to the 2Gb disk and CD-ROM supplied. If this seems gluttonous, consider that I needed to move files and applications from my old IIfx, the 6100, and my PowerBook 5300ce, which between them had access to a total of 6Gb of disk space.

Fitting memory is clearly not for the faint-hearted. The 9500's vertical case stands the motherboard to one side, against which there are fixed plastic columns to hold internal drives and power supply. To add DIMMs, you have to remove all connections to the motherboard, then slide it gently forward before dropping it down as if hinged along the bottom edge. There is a lot to disconnect, including the heavily-finned processor daughterboard, all PCI cards, the plastic clip-on power switch, and a series of ribbon and other connectors along the top of the motherboard.

Fitting the hard disk is easier and does not require disassembly beyond removing the case, provided that you buy the right plastic "sledge" on to which the disk is screwed. Also, remember to set the SCSI ID jumpers so that they don't conflict with other devices on the internal chain.

Splitting up

Once everything had been reassembled, I had a couple of days' work ahead of me before it would be configured and ready to use. I formatted the new hard disk with FWB's Hard Disk Toolkit, dividing it into five partitions of different sizes.

Until I got my first big hard disk, I had not appreciated how the Mac's file system limits can waste space on disks. Just as with Windows 95, MacOS divides a partition into a maximum of 64k allocation blocks.

While files typically occupy more than one block, they can only occupy an integral number of blocks and cannot share a block with another file. If you have many small files, say of less than 4Kb in size, it is a shock to see in their Get Info dialogue that they are each swallowing up 32Kb of your hard disk. Thankfully, the Hard Disk Toolkit

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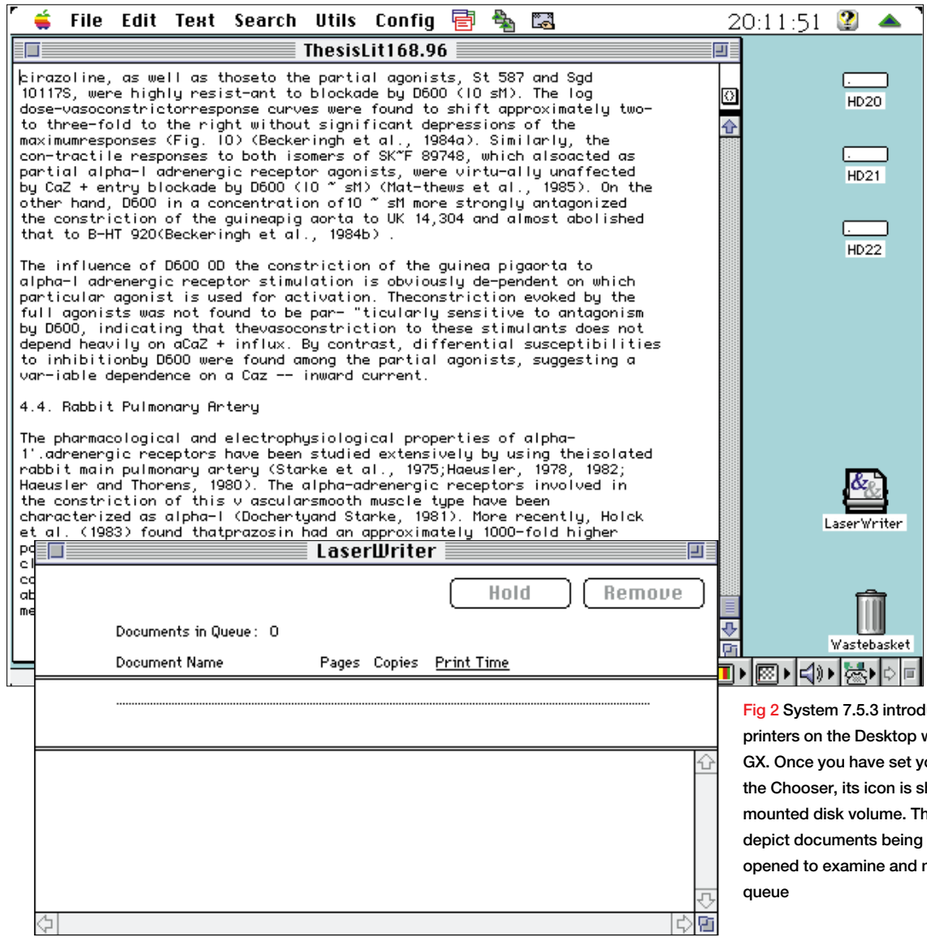

Fig 2 System 7.5.3 introduces, at long last, printers on the Desktop without QuickDraw GX. Once you have set your printer up using the Chooser, its icon is shown below your last mounted disk volume. The icon changes to depict documents being printed, and can be opened to examine and modify the print queue

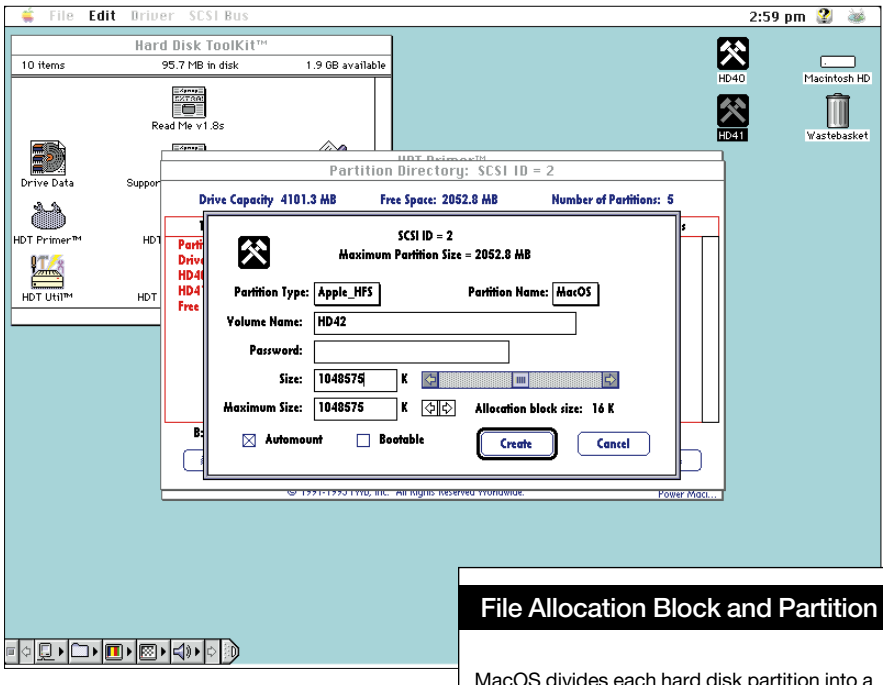

Fig 3 Configuring hard disk partitions is easy when you are formatting a hard disk using FWB's Hard Disk Toolkit: you can adjust the size of partitions to achieve a desired allocation block size. Apple's own Apple HD SC Setup and Drive Setup utilities require you to calculate partition sizes manually

can set partition sizes so that allocation blocks are of a particular size, so all I did was create some partitions for holding smaller files (block size 8Kb) and some for larger files (block size 16Kb).

Once completed for the 4Gb disk, I installed System 7.5.3 on it, restarted from that System, using the Startup Disk control panel, and repeated the process with the 2Gb disk.

Situation normal?

Just as I got everything running sweetly, and found the new desktop printer feature, I noticed that Apple had leaked a couple of bombshells over System 7.5.3.

Remaining bugs and problems with System 7.5 Update 2.0 have led to the release of a further, mercifully smaller, update known as Revision 2. As this is currently only available in US form, we in Europe will have to wait before knowing what it offers. But in the course of clarifying this, Apple engineers revealed that System 7.5.3 resulting from the Update 2.0 is more advanced than 7.5.3 installed afresh. So they advise us to apply Update 2.0 on top of PCI Power Mac 7.5.3. When Revision 2 arrives in British English form, we'll have to install that, too. What a mess!

Mac OS8

Sources inside Apple indicate that the company hoped to ship an initial alpha release of Mac OS8 in August or September. This was another factor in my decision to get some PPC muscle, although the final public release should run on all PowerPC-based Macs with 16Mb of memory.

If you have been wavering over Power Macs, OS8 is a good incentive to buy, as there are no plans to support 68K hardware. This also means that cheaper PowerPC upgrades on add-in cards will be bereft of Mac OS8, as they cannot relinquish full control to the card.

Mac OS8 is a complete redesign and reimplementation of MacOS. Instead of the complex and broad hierarchy of different Managers which make up System 7.x, it consists of a small and efficient microkernel, a larger set of core system services sitting on top, and layers of higher-level service managers such as networking, graphics and multimedia.

The microkernel not only supports pre-emptive multitasking, which automatically cycles between running processes according to their priority, but also provides virtual and protected memory. The current implementation of virtual memory is safe but slow and inefficient. By contrast, that in Mac OS8 will be permanently enabled, and function transparently and efficiently.

My older Macs have small, slow internal hard disks which are 90 percent full with the System folder, utilities and common applications. As I needed more disk space, I added external drives of greater speed and capacity. To get the best out of OS8, these internal startup disks should be replaced with modern, fast drives of greater capacity and kept with large, adjoining, free space for the backing store for virtual memory. Those who use Adobe Photoshop to process large, deep colour, images already make similar arrangements for its scratch files.

Next month I will consider the thorny issues of memory protection and System extensions, and how Mac OS8 promises to reduce data-destructive crashes.

File Allocation Block and Partition Sizes

MacOS divides each hard disk partition into a fixed number of storage allocation blocks (Fig 3). The table below shows, for given block sizes, the maximum size of partition you can create. Because files can only occupy an integral number of blocks, 1,000 files which are 100 bytes long will consume 3.9Mb on a 255Mb partition, but 31.3Mb on a 2,047Mb partition. If you have a large hard disk, divide it into partitions of different sizes so that you can put small files on smaller partitions with smaller allocation block sizes.

Allocation Block (Kbyte)	*Max Partition Size (Mbyte)*
4	255
8	511
12	767
16	1023
20	1279
24	1535
28	1791
32	2047

PCW Contacts

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or **CompuServe 70734,120**

Apple Computer is on 0181 569 1199; www.apple.com and www.euro.apple.com

FWB's Hard Disk Toolkit costs £110 (plus delivery and VAT) from MacLine 0181 401 1111

Claris is at http://www.claris.com/

Modem magic

Using a modem, you can connect up to the outside world: send and receive faxes and electronic mail, and explore the internet. Eleanor Turton-Hill shows you how.

This month we'll focus on the modem, that handy piece of equipment which connects your PC to the outside world. If you haven't got one yet, or if you're not quite sure what to buy, now's your chance to get a grip on the subject. Here, I'll be answering some of the most common questions about modems, how to buy them and what they can do for you. Let's begin with the basics.

Free introductory membership to a service provider is often bundled with new modems. Here is the CompuServe opening screen showing various facilities available on its news service

Service providers like CompuServe also arm you with the tools for internet "surfing". Mosaic is CompuServe's browser software, which allows you to carry out text-based searches of the net

What is a modem?

A modem is the equivalent of a telephone for your PC. It is the equipment you'll need if you want to exchange email or connect to the internet. A modem enables your computer to send and receive files via the telephone lines, transmitting by converting digital data into a series of sounds and receiving by converting them back again. Hence the word "modem", which stands for MOdulator/DEModulator.

Some modems come with introductory CompuServe or AOL (America OnLine) membership along with the appropriate software. CompuServe and AOL are online information services which provide you with access to a massive pool of shareware titles, technical support from the larger IT companies and a multitude of other services.

There are also a whole range of Bulletin Boards and Electronic Conferencing Systems to which you can connect by dialling published telephone numbers. You can then send and receive messages, exchange programs and join conference services like CIX (Compulink Information eXchange) which provides a forum for people to "meet" on the computer system via "conferences".

What types of modem are there?

There are two basic types of modem: internal and external. The former fits into an expansion slot inside the case of your computer, while the latter plugs into one of your serial ports (Com1 or Com2). Neither type is superior, but if the idea of opening up your PC brings you out in a cold sweat, get an external modem as they're much easier to set up and are more portable if you need to use your modem on more than one machine.

These days many systems are shipped with internal modems already installed, which is a big bonus if you want to avoid messing around with hardware. Pre-installed modems generally come with their own bundled software and faxing capability.

Do I have to buy a Hayes modem?

No, but you should get one which is Hayes compatible. Modems which are Hayes-compatible are able to talk to each other in the same language. In techno-speak this means that the modem recognises some or all of the AT command set developed by modem maker Hayes Microcomputer Products. Hayes is a universal standard, so beware of modems which do not support it.

What speed of modem should I buy?

Modems can send and receive a certain amount of data or bits per second (bps). Common modem speeds are 2,400, 9,600 14,400, and 28,800. The faster ones are more expensive but can save you money on your telephone bills. If all you need is a modem for is sending and receiving the odd piece of electronic mail, and occasionally browsing through CompuServe, you won't need a high-speed modem, so look for bargains at the lower end of the market.

Although nearly all currently available modems have a faxing capability, many of the older ones don't, so check carefully if you're buying second-hand. If you do want to be able to fax documents (*see below*), make sure that faxes are transmitted at 9,600bps since this is the speed of any fax machine built after 1986. Older fax/modems were made with 2,400bps performance in data mode and 9,600bps in fax mode.

Which modem standards should I know about?

Unfortunately, there's more to modems than just a range of speeds. There are a whole lot of standards which determine how a modem compresses data and checks for errors. These "standards" have developed in a haphazard way and trying to understand them is like wading through alphabet soup, so I won't describe them at length, but here's a brief overview of both old and new standards.

All 2,400bps modems support a standard called V.22bis, but more recent ones should support two other standards: V.42 and V.42bis. The former (V.42) is an error correction routine which protects you from garbled data caused by interference on phone lines. V.42bis includes data compression which reduces the amount of space taken up by your data before it is transmitted. This allows data to travel faster down the phone lines and saves you money on your phone bills.

A 9,600bps modem should support V.32 as well as V.42, V.42bis and sometimes MNP5 (data compression standard). Towards the end of 1994, the V.34 standard was introduced supporting 28,800bps, but just recently this has been upgraded to V.34+ which supports up to 33,600bps. This is the very latest standard, so expect to pay more for a modem which supports it. Also, make sure that any modem you buy is "BABT approved" because without this approval, it is illegal to connect it.

Fax modems

Nearly all modems now include some sort of fax capability and usually come with bundled software. This fax software provides your PC with most of the functionality of a fax machine. Incoming faxes are received as image files and saved to your hard disk.

Unlike standalone fax machines, fax-modems have the intelligence of your PC at their disposal. This endows them with all kinds of extra facilities. For instance, you can schedule faxes to be sent when the phone rates are cheaper. Also, because the data they receive is in digital form, it is immediately available on your PC for editing or retouching before you print it out. One of the common features in fax software is a cover-sheet facility which allows you to define a front page for your faxes. There's often a quick-fax facility, too, which enables you to create a single page fax without the hassle of loading a word processor.

One problem with scanned images and received faxes is that they hog large amounts of disk space. Some bundled fax software includes an optical character recognition facility (OCR) which allows you to convert received faxes or scanned images from bitmap format to normal text. This not only reduces document sizes but also allows you to edit them in a word processor. ■

What is the internet?

The internet is a massive web of networks connecting millions of people all over the world. But when people talk about the internet, they aren't really talking about the physical machines and wires which make it work. They're actually referring to the facilities they use and the people they meet when they're online. According to recent statistics there are now over 30 million people throughout the world who are using the net, and the figure is growing by an estimated one million people per month.

So what on earth are all these people doing? You may well ask. The internet is not (as you might think) a tool for highly technical people who do incredibly sophisticated things with their computers all day long. It's actually a usable facility for people with any level of computer expertise. You can exchange electronic mail, transfer files, search for information, discuss your political opinions, get news updates, place orders to buy things and gain access to software. The list is endless. If you have any kind of specialist interest, or a problem which requires expert advice, then the chances are that someone out there will know about it.

How do I connect?

Getting onto the internet is a pretty simple operation these days. You don't have to be an academic or a manager in a big corporation to get yourself online. What you do need is a computer and a modem. If you've got neither of these, you're going to have to buy them.

Next on the list is finding a service provider: an organisation which will provide you with an internet connection. There are three basic types of connection: direct, SLIP/PPP, and dial-up/terminal connection.

A direct connection provides you with a permanent and dedicated link to the internet. It is extremely expensive and generally available only to those within large corporations, academic institutions, and government departments.

The second method is to gain access via a company which itself has a direct connection and allows subscribers to dial in and use it. Using an ordinary telephone line, the protocols which make this technically possible are SLIP and PPP. There are three main benefits of connecting in this way: you get your own hostname, you can download files direct to your computer, and you can use a graphical browser on the World Wide Web.

Thirdly, there is the dial-up connection offered by commercial service providers such as AOL or CompuServe. They will charge you on a monthly basis for a range of services and access to their internet gateway. With this type of connection, you are not linked directly to the internet. You are actually connected to their system, which in turn is connected to the net, so you don't have a hostname as such. Instead, you're seen by the rest of the internet as "name@bigservice.co.uk". Downloading files happens in two stages: firstly, to download to the online system, and secondly, to download to your own machine.

No-nonsense **Buyer's Guide**

Buying a **PC**

The one universal rule is that PCs get cheaper, better and faster all the time. The result is that your state-of-the-art PC can become outdated and old-fashioned in a couple of years. It may still work perfectly well, but it probably won't run very fast and won't run the latest software. If you're just planning to do simple word processing, this may not matter. But we're assuming here that you want to buy a general-purpose multimedia PC that can play games, use CD-ROMs and run a range of modern software.

Buying Don'ts

- Don't buy a machine with less than 16Mb of memory if you plan to run Windows 95.
- Avoid cheap 14in monitors.
- Bundled 14,400 modems are not the bargain they seem. Opt instead for a 28,800 modem.

Buying Do's

- You can never have too much disk space. Spend extra cash on the next hard disk size up.
- Make sure Pentium motherboards have an Intel Triton chipset.
- Check the warranty. Is it for on-site or back-to-base repairs? If it's on-site, does the manufacturer offer guaranteed response times?
- Check the technical support. Is it free? Is it easy to get through to?
- If you're buying the PC for home use, you'll probably want full multimedia capabilities so that you can use CD-ROM games and edutainment products and play video clips.

This should include at least a

- 16-bit SoundBlaster-compatible sound card
- Speakers
- Think about upgrading your memory immediately. RAM pries are low at the moment — you can pick up 16Mb of EDO RAM for around £100 or less if you want to do your own upgrading. It is also the quickest way to improve the performance of your machine, often more than upgrading your processor.
- Look at the software bundle. If you want an office suite it is far cheaper to buy it as part of the bundle: larger manufacturers can offer MS Office, for example, at about a third of the RRP. Multimedia CD-ROM bundles will not include the UK version of Encarta '96 — Microsoft will only allow the US version to be bundled.

Other things to consider

PCs have become a lot more similar in the last few years. The days when smallish computer companies designed their own chipsets (the computer chips that assist the computer's main processor) are long gone. Most small box-shifters buy their motherboards from Taiwanese manufacturers. Larger companies either design their motherboards themselves (Apricot, Compaq, IBM) or get motherboards built by other companies to their specifications (Gateway).

Most manufacturers are now using the Intel Triton II chipsets, either 430HX or 430FX. The HX chipset is meant to be better for office applications and is optimsied to work well with large arrays of EDO RAM. The FX chipset works best with multimedia applications and SDRAM.

Cyrix chips are worth considering. Their 6x86 chips, such as the P133+, are often cheaper and give better performance than their Intel counterparts.

If you are serious about multimedia, it may be worth upgrading your sound card to a 16-bit wavetable card. A six-speed CD-ROM drive will give you a noticeable performance gain over a quad-speed, but the speed increase of an eight-speed over a six-speed is less tangible. Good speakers are powered from the mains, not from your PC.

For up-to-date PC reviews, see our August '96 cover story

•PCW Minimum specification

This is the absolute minimum spec we think you should even consider buying now. It's suitable for general business use: word processing, databases and spreadsheets, and with the addition of a modem, for accessing the Internet.

- Windows 3.11
- DX4 100MHz processor
- 8Mb RAM
- Graphics card with 1Mb of memory
- 810Mb hard disk
- 3.5in floppy disk drive
- Quad-speed CD-ROM drive
- 14in colour monitor
- PCI local bus

•PCW Recommended specification

If you're not completely strapped for cash this is the PC specification we recommend. No-one who works at PCW would settle for less.

- Windows 95
- Pentium 133MHz processor (a faster processor will make your computer run more quickly and smoothly)
- 256Kb secondary cache (again this makes your computer run faster)
- 16Mb EDO RAM. 16Mb of memory speeds your PC up a lot, particularly if you're multitasking (using more than one application simultaneously)
- Graphics card with 2Mb of memory
- 1Gb hard disk — modern computer software takes up a lot of space
- 3.5in floppy disk drive
- Six-speed CD-ROM drive (video clips will play more smoothly; you will be able to access files on CD-ROM disks more quickly)
- 15in colour monitor (one inch doesn't sound a lot, but is easier on the eyes)
- 16-bit SoundBlaster-compatible sound card
- Speakers
- PCI local bus

•PCW Best Specification

Our Best Spec 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 to add even more memory, a bigger hard disk, a more powerful graphics card, or a larger monitor.

- Windows 95
- Pentium 200MHz
- 512Kb secondary cache
- 32Mb EDO memory
- 2Gb hard disk
- 3.5in floppy disk drive
- Eight-speed CD-ROM drive
- 17in colour monitor
- 4Mb VRAM or WRAM graphics card (this means your graphics card can display more colours and a higher resolution on your monitor — 16 million colours at a resolution of up to 1280 x 1024
- 16-bit wavetable sound card
- Quality speakers
- PCI local bus

Buying a **Notebook**

Notebooks are one area in which it's often safer to stick to brand names. Not that some of the Far Eastern kit doesn't work perfectly well, but reliability does seem to be a problem and it can be fiendishly difficult to obtain spares. The other useful guideline for notebooks is to try before you buy.

Standard notebook specifications are generally a step or two behind the desktop equivalents.

What to look for in a notebook

- **Pointing device** There's been a wholesale move 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 using one finger).
- **CD-ROM drives** 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's a choice between a CD-ROM drive and a floppy disk drive. Again, if the notebook is to be your only machine, specify both. Otherwise, reinstalling an operating system can mean returning the machine to the manufacturer.
- **PC Cards** Modern notebooks all have at least one PC Card slot. They take credit-card sized expansion cards which can 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 or active matrix screens are replacing the slower dual-scan or passive matrix screens. It means the screen image is refreshed much more quickly.
- **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?

•PCW Minimum specification

Notebooks change rapidly. It's often possible to pick up end-of-line machines with 486 processors from brand-name manufacturers such as 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 specification

- Windows 95
- Pentium
- Quad-speed CD-ROM drive
- 256Kb secondary cache
- 16Mb RAM
- On-board graphics with 1Mb of memory, PCI local bus
- 500Mb 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. You're either loaded, or your company's picking up the tab.

- Windows 95 or Windows 3.11
- Pentium
- 256Kb secondary cache
- 16Mb RAM
- On-board graphics with 2Mb of VRAM memory, PCI local bus
- 1Gb hard disk
- 3.5in floppy disk drive
- Quad-speed CD-ROM drive
- Active matrix 1024 x 768 TFT screen
- Long battery life

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Glossary of Computing: **Important terms and acronyms**

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.

Acronyms
These form most of the technobabble which has been refined over many years to confuse you, the user, and keep us, the writers, in business. Try to take as little notice as possible of it: the computer industry is littered with TLAs (Three-Letter Acronyms).

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 more specific uses.

ASCII (American Standard Code for Information Interchange)
Usually a synonym for plain text without any formatting (eg italics, bold or hidden text). Since computers naturally use binary rather than Roman characters, text has to be converted into binary 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 amount of data 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 (pronounced buy-oss). 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 O or 1. A Kilobit (kbit) is 210, 1,024 bits; and a Megabit is 220, 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 1,024 Mb. 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 some 485 high-density 3.5in floppy disks. The disadvantage, however, is that you can only write once on CD-ROMs, but 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 that fit inside PCs to provide extra functionality. For example, one might be an internal modem, providing the same functions as an external one (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 to both screen and printed letters. TrueType and Type 1 fonts are stored as shape descriptions, scalable to any size.

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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 that 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.

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.

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 — 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 is still 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
A digital voice and data telephone network which looks set to replace the current analogue one. ISDN adaptors are already starting to replace modems as a fast way of accessing the internet and transferring data.

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 has now largely replaced.

M

Macintosh (Mac)
A type of personal computer, made by Apple, that is incompatible with PCs. Developed as a rival standard, its operating system looks like Windows, except that it predates it and (in many 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 kind of bus designed by IBM to beat EISA. Although faster, it never became popular 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 and 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 that disappears whenever you turn your computer off and is much faster to access than a hard disk. It acts as a kind of staging post between your computer's hard disk and its main processor.

•DRAM Dynamic Random Access Memory
This requires its contents to be replaced every 1/1000th of a second and is the most common form of memory in PCs.

•SRAM StaticRAM
Retains memory until the power is switched off.

•VRAM VideoRAM
Faster than DRAM, this is used by graphics cards.

•EDO Extended Data Out RAM
The latest type of memory, offers improved performance.

Cache memory
Temporary memory set aside to store the information that is accessed most frequently. The Pentium processor has 8Kb of cache built in. This can be further speeded up by a secondary cache, typically 256Kb. Part of your DRAM is often used to cache your hard disk.

ROM Read-Only Memory
A kind of memory that 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, such as the information the computer requires when you start it up.

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 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, a powerful PC with a large hard disk that can be shared by everyone.

O

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

Package (See Application)

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 Cards)

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.

Pixel
Picture element. The smallest possible 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
The chip that does most of a computer's work.

Programs (See Applications)

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Public Domain
Software that is absolutely free. The author usually retains copyright, but you can make as many copies as you want and pass them to other people. Public domain software often consists of small utilities the author feels might be useful to other people. It is often confused with shareware.

Q

QWERTY
The name of a standard English language keyboard, derived from the first six letters on the top row. The French equivalent is AZERTY.

R

RAM Random Access Memory (See Memory)
Reboot
(see Boot)
RISC
Reduced Instruction Set Computing. These are starting to replace CISC (Complex Instruction Set Computing), as they are generally 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 starting to rival EIDE on PCs.
Serial Port
The serial port, of which there are sometimes two (com1 and com2), is used by your PC to communicate with the outside world. Serial ports are predominantly used by modems and similar devices, which communicate quite slowly. Some mice use them. Faster communications are achieved via the parallel port.
Shareware
A way of distributing software which is often used by smaller programmers rather than big software houses. It is freely available, but not free. 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 of up to 16Mb.

T

Tape Streamer
Magnetic tape recorder designed for backing up data from your hard disk.

U

UART (Universal Asynchronous Receiver Transmitter)
Pronounced you-art. A chip that allows your PC to cope with high-speed communications.
V34, V32bis
A series of CCITT standards that defines modem operations and error correction. There are over 20, but the key ones are:
• V32.bis, the standard for 14,400bps modems.
• V34, the new standard for 28,800bps modems (see Baud). Don't buy a modem that doesn't comply with one of these standards.
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 supposed 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. Currently has the Windows 3.11 interface, but will soon be available with the 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 necessary for connecting to TCP/IP networks.
WORLD WIDE WEB
As service on the Internet which uses special software called Web Browsers (Netscape and Internet Explorer are the two best known ones) to give you access to pages of information with text, pictures and multimedia.
WYSIWYG
An acronym for What You See Is What You Get. What you see on the screen is exactly what you see when you print your work out.

Z

ZIF (Zero Insertion Force)
Sockets used for large CPUs. Lifting a handle lets you remove the processor.
ZIP
Better known as PKZIP, this is a widely used shareware utility that compresses files so that they take up less room. You can tell when you have a ZIPped file as its name ends in ZIP. PKZIP is the most common form of compression of its kind.

How to choose an **ISP**

There are now over 100 Internet Service Providers, which makes choosing the right one harder than ever before. Competition between them is now so fierce that many ISPs are happy to offer a month's free trial.

All ISPs let you send and receive internet email, browse the web and download files from internet servers. But there are differences between the extra services provided.

Big centralised online services like AOL and CompuServe offer discussion areas and specialised content like online magazines and easily-searchable file libraries. Some providers give you one email address per account while others give you as many as five. Some charge a flat-rate for internet access while others charge extra if you exceed a specified number of hours online.

The quality of the software and technical support provided also varies. In general, the big "consumer" ISPs offer better support and more commercial software. Smaller, more basic operations often offer cheaper deals. Some ISPs are more geared up to business users who may need a fast ISDN connection and/or require the service provider to host or even design web pages for them.

Your ISP can have a big effect on the performance of your internet connection, particularly access speed to US sites. Few ISPs provide local call access to anywhere in the UK. In London you'll have plenty of choice, but in West Scotland the choice will be limited.

•PCW Recommended Products

Big commercial ISPs. Not cheap, but easy to use, with plenty of extra services thrown in.

CompuServe 0800 289378

AOL 0171 385 9404

Barebones service that's not for beginners but does make your PC a full internet node in its own right.

Demon 0181 371 1000

Another established service provider that's worth considering.

Easynet 0171 209 0990

Buying a **Printer**

There are two main types of printer: laser and inkjet.

■Lasers
Most office printers are lasers. They work pretty much like photocopiers, and are cheap to run and print quickly. Their disadvantage is higher initial cost and mono output. Laser printers are available in all sizes and at 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 work by sending a description of the page that's being 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 that the image looks the same on a monitor (75dpi), a laser printer (300dpi) or a professional image setter (2400dpi).

■PCL
This stands for Printer Control Language, and it is Hewlett-Packard's alternative to PostScript, licensed to many clone-printer manufacturers. Printers using this tend to be cheaper than PostScript ones, but output will vary from one printer to another, making it less 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 will only work with Windows, but are cheap and fast. They are also only suitable for a personal printer and will not work across a network.

•PCW Recommended Products

Cheap lasers Epson EPL-5500:**Epson 0800 220546**; street price £300 (see PCW February '96)

Sub-£750 lasers Hewlett-Packard 5P: **Hewlett-Packard 01344 369222** (see PCW November '95)

Network lasers Hewlett-Packard 5P: **Hewlett-Packard 01344 369222** (see PCW February '96)

■Inkjets
Inkjets work by spraying ink onto paper. They are cheap to buy but more expensive to run, and slower. Even cheap inkjets can print in good-quality colour.

•PCW Recommended Products

Epson Stylus 800 colour: **Epson 01442 61144;** street price £350 (see PCW August '95). Canon BJC-610: **Canon 0500 246246;** street price £370

■Hybrids
For home use and small offices a hybrid could be the answer. They combine a printer, a fax machine and copying capability in one unit.

•PCW Recommended Products

Hewlett-Packard OfficeJet LX: **HP 01344 369222;** street price £499 (see *PCW* December '95)

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
The most common type of scanner. They range in price from £300 to over £3,000. They're capable of scanning colour pictures to a high standard. Most have transparency adaptors as an optional extras

■Document scanners
A new category which aims to combine the reliability of flatbeds with speed and portability. They're intended for OCR and document management. Most will cope with photographs and some with colour, but it's not their forté.

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Buying a **Fax Modem**

You'll need a modem to connect to the internet or an online service such as CompuServe or AOL, and to send and receive email.

Modems are available in three formats: as PC cards to plug into notebooks, as external boxes, and as expansion cards. PC card modems cost the most and external modems cost slightly more than the expansion card variety.

Apart from the case and the external power supply, there's often little difference between the internal and external versions of a modem. Most modems now have fax capability built in, which means you can receive faxes on your PC to view or print out. If you're strapped for cash, a V32bis 14,400Kbits/sec modem is adequate. However, prices have now fallen so rapidly that a V34 28,800Kbits/sec modem is probably a better bet.

•PCW Recommended Products

Fax-modems

External — Motorola 3400 Online:**Motorola 01923 404343;** street price £160 (see PCW February '96)

•PCW Recommended Products

Flatbed Scanners

Professional — Arcus II: **Agfa 0181 231 4200;** street price £2,600.

Intermediate — Epson GTX 9000:**Epson UK 01442 61144;** street price £750.

Budget —Umax Vista S6E: **IMC 01344 872800;** street price £299 (PCW, Sept '96).

•PCW Recommended Products

Document Scanners

Visioneer PaperPort VX: **Computers Unlimited 0181 200 8282;** street price £299. Logitech PageScan Colour: **Logitech 01344 894300**; street price £299. Plustek PageReader 800:**Scan Direct 01292 671676;** street price £149 (PCW, March '96).

Buying a **CD-ROM Drive**

Just about the only things which differ on today's CD-ROM drives are their speed and means of connection. The most common connection is IDE or Enhanced IDE (EIDE). It is possible to connect an IDE CD-ROM drive to most existing IDE hard disk controllers. Older PCs may need a newer EIDE controller. IDE controllers are also found on many sound cards.

The first CD-ROM drives spun the disc at the same speed as an audio CD and were called single-speed, delivering a sustained data transfer rate of 150Kb/sec. Double-speed drives spun twice as fast, doubling the data transfer to 300Kb/sec, and quad-speeds twice as fast again, raising transfer to 600Kb/sec.

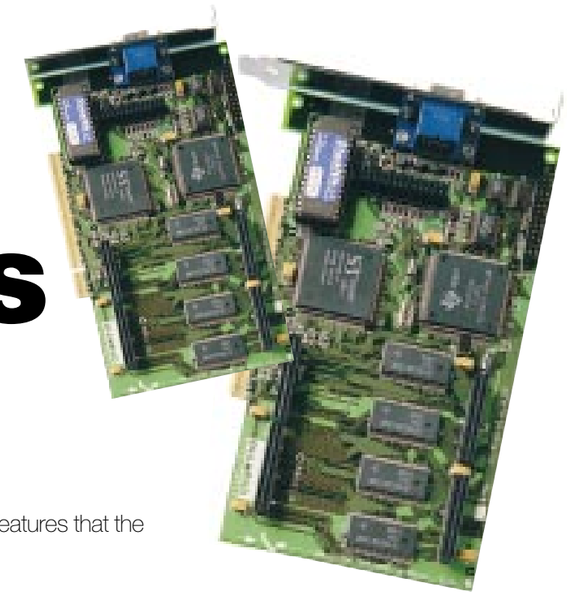
Six-speeds are currently the standard (900Kb/sec), with eight-speeds (1200Kb/sec) becoming increasingly common. All figures are theoretical maximums. Buyers should go for quad-speed or higher. There is little to choose between models, but off-the-shelf supplies are frequently short. Internal IDE quads start at around £100 and six-speeds around £130.

•PCW Recommended Products

CD-ROM Drive

Teac CD56-E six-speed: fitted to many new PCs and costing around £85 (PCW January '96). The Goldstar 8X is a good 8-speed choice for around £99 (PCW Aug '96).

Buying a **Graphics Card**



The graphics card sits inside the PC and controls the features that the software can display on the monitor.

Check the amount of memory on the card. 2Mb is about standard these days, 1Mb is skimpy and 512Kb is barely usable. 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: all you need to know is that a large number of bits means faster performance and more colours.

The most important aspect of your video card, and the most frequently quoted feature, relates to the resolution which the card supports in Windows. This is measured in terms of the number of pixels that 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 only manage 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 Hertz) is important, too. It represents the number of frames displayed on screen per second. A flickering display is very tiring to use.

Finally, find out whether your video card is "local bus" or not. "Local bus" is a type of 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 (Industry Standard Architecture) interface.

•PCW Recommended Products

Graphics Cards

ATI Video Xpression: **ATI Technologies 01235 833666;**around £175 (see Graphics Card group test, PCW June '96)

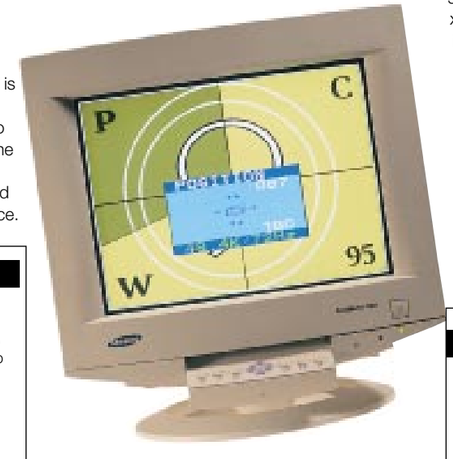
Diamond Stealth 64 VRAM: **Diamond 01753 501400;** from around £190

VideoLogic GrafixStar 400:**VideoLogic 01923 260511**from about £115

Buying a **Monitor**

Regardless of your computer application, you'll be looking at your monitor all day — so get a good one.

Some people claim not to see monitor-flicker, but your brain will, 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 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 by 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 may only have 14.5in, and a 17in only 16in

•PCW Recommended Products

For 15in try the CTX 1569MS (around £300) or the NEC M500 multimedia around £410 on the street. At 17in there's the Sony 17sfII or the Taxan Ergovision 730TCO-S at around £500 (PCW July '96).

p342 ➢

Buying a **Sound Card**

As its name suggests, it adds sound capability to a 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

Creative Labs AWE-32: 01245 265265; £199 (PCW, April '96).

Budget: Aztech SoundGalaxy Waverider Pro: **Aztech 01734 814121;** £79 (PCW, April '96).

Buying **Software**

Just a few years ago there were dozens of different software applications in each category. In the last two years or so, however, there's been rapid product consolidation. Other magazines list large numbers of packages, most of which are out of date and aren't worth considering. We've distilled each category down to just one or two recommended products.

Software A-Z

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: Lakeview LMS and Exchequor from SBS Systems.

C

■ CAD SOFTWARE Computer Aided Design covers everything from architectural drawings through office planning to complex engineering drawings.
Recommended products: AutoCAD, now at release 13, is still the industry standard. However, it's expensive and complex. For the casual user, Drafix QuickCAD is a cheap and accessible way to try your hand at it.

■ CONTACT MANAGERS (see PIMs)

D

■ DATABASE At its simplest, an electronic card index. For just a few hundred names and addresses, an electronic filofax such as Lotus's 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 office environments you're more likely to use a database application that somebody else has written for you.
Recommended products: Lotus Approach, Microsoft Access

■ DRAWING SOFTWARE Programs for drawing that work using vectors. This means each shape drawn is described using mathematical equations.
Recommended products: At the budget end, GSP Designworks 3 stands out. At the professional end of things it's FreeHand 5 which gets our plaudits.

I

■ 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 product: 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 in the Suites.
Recommended product: Microsoft Works

O

■OCR SOFTWARE Optical Character Recognition software converts printed text into computer text you can edit. You will also need a scanner or fax card to get the printed text on to your PC. OCR saves re-keying documents and can cut down drastically on paper filing systems.
Recommended products: Omnipage is the best product we've found, but TextBridge offers most of the same capabilities for less cash.

p343 ➢

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 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 that are 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 are much easier to use but generally sacrifice performance and flexibility in the process.
Recommended products: Delphi 2.0 is a great example of scalability, catering for beginners and serious developers working on major projects. Visual C++ is the pick of the high-end Windows development tools.

■ PERSONAL FINANCE These help you manage home finances. They're also well suited to some small businesses and tend to be easier to use than full-blown accounts packages.
Recommended products: Quicken is the outstanding product in this category and has no serious rivals.

R

■ REMOTE CONTROL SOFTWARE Software which lets you access and control a PC remotely usually using a modem.
Recommended products: ReachOut, for its simple interface and support for different networks, particularly TCP/IP.

S

■ SPREADSHEET An electronic version of an old-fashioned ledger. Ideally suited for balance sheets and sales figures. They now include excellent graphing and charting facilities.
Recommended products: Lotus 1-2-3, Microsoft Excel.

■ SUITES These days, most general business software (word processors, spreadsheets, presentation graphics packages) is sold in suites. Two suites are widely available: Lotus SmartSuite and Microsoft Office. If you buy them bundled with a new PC, they can cost £100 or less. Bought separately, they cost between £200 and £300. Lotus SmartSuite also contains a database. For Microsoft Office, you pay extra for Office Professional which contains Microsoft's Access database.
Recommended products: Microsoft Office is now close to the industry standard. Its high level of integration gives it the edge over the opposition.

V

VISUAL PROGRAMMING (see Programming Tools).

W

WORD PROCESSOR An application in which you write letters and reports or even produce a simple newsletter. The latest word processors have advanced features such as outliners, table editors and facilities for adding up columns of figures.
Recommended products: Microsoft Word is the clear market leader. WordPro (formerly AmiPro) is a capable alternative.

A-Z of Recommended Software Products

	Category	Product	Supplier	Contact	Price (Excl. VAT)	Date of PCW review
A	Accounts	Lakeview LM3	Lakeview Computers	0181 303 3329	£8,750	Jan-96
	Accounts	Exchequor	SBS Financial Systems	01202 298008	£5,980	Jan-96
C	CAD	AutoCad Release 13	Autodesk UK	01483 303 322	£3,150	Oct-95
	CAD	Drafix Quick CAD	Roderick Manhattan	0181 875 4400	£69	Oct-95
D	Database	Approach	Lotus	01784 455 445	£99	Nov-95
	Database	Access	Microsoft	01734 270 001	£220	Feb-96
	Drawing	Freehand 5	MacroMedia	01344 761111	£450	Apr-96
	Drawing	Designworks 3	GSP	01480 496789	£39.95	Apr-96
I	Image Editing	Photoshop	Adobe	0181 606 4000	£382	Apr-95
	Image Editing	Paintshop Pro	Digital Workshop	01295 258335	£49.95	Jun-95
	Integrated Package	Works	Microsoft	01734 270 001	£79.99	Oct-95
O	OCR	Omnipage	Caere	0171 630 5586	£595	Nov-95
	OCR	Textbridge	Xerox Imaging Systems	01734 668 421	£349	Nov-95
P	Personal Finance	Quicken	Intuit	0800 585058	£39.95 (Incl. VAT)	May-96
	PIM/contact manager	Organizer 2.1	Lotus	01784 455 445	£99	Mar-96
	PIM/contact manager	Goldmine for Windows	Elan Software	0171 454 1790	£395	Mar-96
	PIM/contact manager	Sidekick 95	Starfish UK	0181 875 4400	£39	Mar-96
	Presentation graphics	Freelance	Lotus	01784 455 445	£415	Sep-94
	Presentation graphics	Powerpoint	Microsoft	01734 270 001	£220	Sep-94
	Programming tools	Visual C++	Microsoft	01734 270 001	£379	Feb-96
	Programming tools	Delphi 2.0	Borland	01734 320 022	249	Feb-96
R	Remote Control	Reachout	Stac Electronics	01483 740 763	£110	Nov-95
S	Spreadsheet	Excel	Microsoft	01734 270 001	£220	May-95
	Spreadsheet	1-2-3	Lotus	01784 455 445	£365	May-95
	Suite	Office (Standard)	Microsoft	01734 270 001	£360	Mar-96
	Suite	Office (Professional)	Microsoft	01734 270 001	£460	Mar-96
W	Word Processing	Word	Microsoft	01734 270 001	£220.00	Oct-96
	Word Processing	WordPro (AmiPro)	Lotus	01784 455 445	£99.00	Oct-96

Buyer's Charter

Mail order protection scheme

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6. Does the price quoted include everything discussed? Is VAT extra?
7. Check how they will deliver and if times are guaranteed.
8. Is telephone support or on-site maintenance included in the price? If a return to base warranty can be extended, how much does it cost?
9. Check that all branded components are genuine.
10. Is the supplier reputable? Do they comply with BS5750 or ISO900? If in doubt, ask to see customer testimonials.

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Personal Computer World Order form

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..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / ..... TIME .....

ORDER REFERENCE NUMBER (IF QUOTED) .....
DISPATCH REFERENCE NUMBER .....

CUSTOMER DETAILS

NAME .....
COMPANY .....
ADDRESS .....
.....
.....
..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / .....
ORDERED BY: ❑ TELEPHONE ❑ FAX ❑ POST

ADVERT APPEARED IN PCW:
ISSUE DATE ..... PAGE .....

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £

SUB TOTAL
DISCOUNT
CARRIAGE
SURCHARGES
VAT
TOTAL

METHOD OF PAYMENT

❑ PERSONAL CHEQUE ❑ PURCHASE ORDER ❑ CREDIT CARD
❑ C.O.D ❑ CHARGE CARD ❑ OTHER (SPECIFY) .....

CREDIT CARD COMPANY ..... START DATE ..... / ..... / .....
CHARGE CARD COMPANY ..... START DATE ..... / ..... / .....
CARD NUMBER (below) EXPIRY DATE ..... / ..... / .....

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DELIVERY DETAILS

DELIVERED TO (ADDRESS)
(IF DIFFERENT FROM ABOVE) .....
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..... POSTCODE .....

AGREED DELIVERY DATE ..... / ..... / .....
❑ TERMS OF WARRANTY ❑ MONEY BACK ❑ RETURNS POLICY
❑ COST OF EXTENDED WARRANTY ❑ HELPLINE
Details: .....
.....

SIGNED ..... DATE ...../...../..... DAYTIME TELEPHONE NUMBER .....

News

The rise of Nintendo this fall?

Nintendo has confirmed the european launch of the Nintendo 64 home video game system for late autumn, after its US release on 30th September. Following the Japanese launch in June, Nintendo claims that 300,000 N64s were sold on the first day and predicts sales around the world to reach five million units before Christmas. It's unlikely that the Mario 64 game will be bundled with the Nintendo 64 for initial UK sales, but this could occur at a later date.

Nintendo has joined with Silicon Graphics to use its Reality Immersion Technology in the Nintendo 64. It consists of a custom version of the MIPS 64-bit R4300I RISC microprocessor, a MIPS Reality Co-Processor and an embedded software layer. The Reality Co-Processor has been designed specifically by Silicon Graphics for Nintendo and combines advanced features such as a high frame rate, realtime anti-aliasing and texture-mapping to create the Nintendo 64 realtime game environment. (*See also, p112*).

THE Games 01703 653377

No gain without pain in Ecstatica

Psygnosis plans to release Ecstatica 2 early next year. Having saved Ecstatica in your previous adventures, you return home to the castle of your youth only to find that evil is back in the land. This time, however, the Lord Demon has come back for you, so it's a gruesome personal vendetta.

New features include Windows 95 DirectX mode for high-resolution gaming, an enhanced 3D engine giving lifelike motion to characters and a wider variety of useful objects such as potions, spells and weapons. The first version of Ecstatica hit the top of the HMV PC Games charts in early 1995 and *PCW* reviewer, Steven Helstrip, described it as "a phantasmagorical tale of death, torture and demonic possession that makes DOOM look like a Merchant-Ivory film". Not even its "18 certificate" can prepare you for the horror and violence in store…

Psygnosis 0151 282 3000

Blast the biomechs in bloody Bedlam

Bedlam should be ready for a simultaneous launch on all formats in September. Developer, Mirage, describes it as an action strategy blast-em-up which takes place in a futuristic city. You take on the role of a mercenary and carry out a variety of missions to overcome the BioMechs, biomechanical creatures originally created by humans but now in rebellion. BioMechs include Demons who possess great intelligence and tend to attack in packs which encircle their prey.

Mofos on the other hand are more solitary but pretty stupid. Their means of attack is fairly gruesome: unable to use weapons, they slash and rip with their deadly foreclaws. Sentries, meanwhile, can deliver an awesome amount of fire-power and are resistant to attack. It's easy to avoid them as they don't move much and have certain hidden weak points. They are not invincible.

Other hazards to look out for are vicious "terrordactyls", kamikaze frogs and booby-trapped buildings. All your weapons must be bought from the arms procurement shop where there's a large choice varying from armour-piercing shells, cannons that fire bolts of electricity, guided missiles and the "nuke" which generates a massive explosion. The game promises blood, guts and gore and everything on screen is destructible.

GT Interactive 0171 258 3791

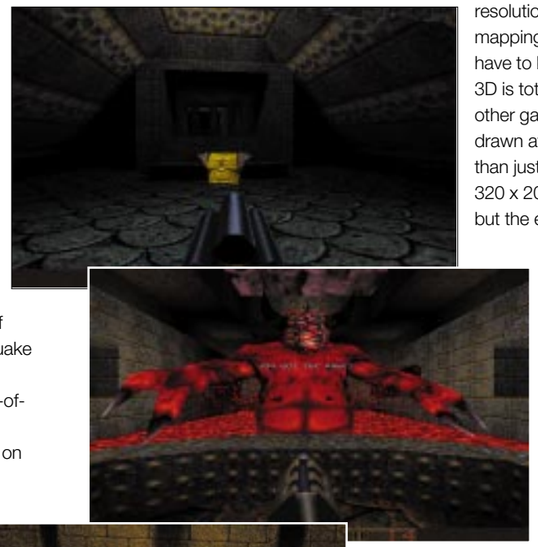
Quake

It's time to move on: with the aid of magical power-ups and a shotgun, we wage war against mad dogs, trolls and skeletons in the follow-up to Doom.

Just when you thought it was safe to go back to the keyboard, Id Software has released another game. Following our preview last issue, this month sees the long-awaited launch of Quake, the 3D blockbuster from the creators of Doom.

As with Doom and the clones that followed it, Quake is a first-person shoot-em-up adventure. Its plot is best described as low-key, bordering on non-existent, and the aim is to blast your way to the end through a number of increasingly challenging levels. Where Quake differs from the rest is in the depth of its gameplay, coupled with an all-new state-of-the-art graphics engine.

The game casts you as a lone soldier on a mission to seek out and destroy an invader from another dimension, codenamed Quake. The action takes place in the alien's homeworld, and is split between four episodes and a number of different stages. The first stop in your search is the aptly-named Dimension of the Doomed, a dark and foreboding military complex packed with numerous nasties.



Dazzling graphics combined with good gameplay should make Quake a winner just like Doom, its predecessor

You start your mission armed only with a small axe and a shotgun, but bigger and better weapons and ammunition can be found *en route*. Chief among these are a double-barrelled shotgun and the powerful and far more satisfying nail gun. Other handy bits include a grenade launcher and a top-of-the-line thunderbolt, but you'll need to explore before these show themselves. Mystic runes and magical power-ups are scattered around, which can temporarily improve your ability to face the opposition which ranges from foot soldiers and mad dogs, to bomb-touting trolls and skeleton warriors. Each has its own unique method of attack and needs to be tackled slightly differently. Skeletons destroyed with a shotgun have a habit of resurrecting themselves and a well-aimed grenade is more likely to have the desired effect. Similarly, a beast that fires projectiles can't do much with a nail gun up its nose.

As well as exploring military installations, Quake's worlds have you wandering through sewers, castles, low-gravity areas and lava pits. Traps await you at almost every turn, and hidden switches and panels must often be found to proceed to the next level. It pays not to take any surroundings at face value.

With Quake's 3D engine, for once you can believe the hype. Graphically, the game is astonishing when played in high resolution, with advanced texture-mapping and lighting effects that have to be seen to be believed. The 3D is totally convincing and unlike other games, every character is drawn at the current resolution rather than just the scenery. Quake runs at 320 x 200 pixels (the same as Doom) but the engine supports displays of up to 1,280 x 1,024.

Audio takes a back seat to the graphics, but various grunts and groans are used to good effect. The music in the final version of the game is provided by Nine Inch Nails and streams from the CD as you play.

All of this would be nothing without good gameplay. The levels are well-designed, the monsters show intelligence and the atmosphere could be cut with a knife. If you jumped when you first ran into Doom's pig monsters, Quake will make your hair stand on end. Deathmatch network games are supported for up to eight players, with definable colours for each player. Late nights at the office will never be the same. Id software has done it again. The shareware version can be downloaded from www.idsoftware.com.

Chris Cain ■

•PCW Details

Quake

Price £45 (estimated)
Contact GT Interactive 0171 258 3791
System requirements 60MHz Pentium or better, 8Mb RAM minimum, 16Mb recommended (16Mb required for running under Win95), CD-ROM drive. MS-DOS 5.0 or better or Windows 95 (does NOT run under Windows NT) 30Mb disk space for shareware, 80Mb for registered version.

★★★★★

Star Trek: Klingon

Does a wrinkly forehead tickle your fancy? If so, this Klingon training program could be for you.

Buy a wig and grow facial hair to become a true Klingon

Star Trek: Klingon is an interactive training program, directed by Jonathan Frakes, aka Commander William T Riker in Star Trek: The Next Generation. It boasts 90 minutes of never-before-seen footage and "radical new full motion edge-to-edge video", which is full-screen video to the rest of us.

Star Trek: Klingon is on three CDs and installs from Windows 95, from which it can be run. It doesn't require a huge amount RAM, but a Pentium is recommend.

There are two parts: the Language Lab and the Immersion Studies module. The Language Lab teaches you the Klingon language and helps you get a grounding in Klingon culture. The Immersion Studies program is a role-playing session which takes place on the Starfleet's Holodeck under the watchful eye of Gowran, head of the Klingon High Council. He also works in the Language Lab — obviously not much work for Klingon bigwigs these days!

You play Pok, a Klingon youth, who is preparing for his Rites of Ascension, the ritual every Klingon youth must go through before becoming a warrior. The action begins at the pre-ritual "lopno" (party) at Pok's parents place. His father is killed and with Gowran's help, you must find the murderer and close the Circle of Vengeance.

Events unfold at a snail's pace, and you must choose which scenario to play through. Click the mouse for information on objects within the room. When you have to make a decision, a glowing Daqtagh knife appears. Target and single click the right choice.

Star Trek: Klingon is thoroughly disappointing. The story is slow-moving and the plot is predictable. I can't help thinking that this game is a feeble attempt to cash in on Star Trek's popularity.

Fiona Corless ■

PCW Details

Star Trek: Klingon

Price £44.99 (Incl.VAT)
Contact CIC UK 0181 846 9433

System requirements Windows 3.1 or higher, 18Mb hard disk space for Immersion Studies program, 12Mb hard disk space for Language Lab, colour SVGA monitor, 486/66 (Pentium recommended) 8Mb RAM, double speed CD-ROM, SoundBlaster16 compatible soundcard, and mouse.

★★

Fire Fight

As a top-notch fighter pilot, your mission is to rule out intergalactic war, at all costs.

An aerial view of the intergalactic peace process

War raged throughout the galaxy. Hundreds of planets fought futile battles until one soldier proposed restoring order. Each planet elected two members to form a phantom council whose verdicts were absolute. Uprisings continued on worlds which knew no other way. The council members voted to create teams of the best fighters to uphold the law. When the final word of the council is challenged, the dissident voice is silenced: Fire Fight means peace at any price.

As one of the galaxy's greatest fighter pilots, you have been chosen by the council to carry out 18 missions. You are equipped with an Oriontech 99 Series 1 "Jagger" which features variable on-board armament (VOBA) technology, allowing the craft to switch between six deadly weapons.

Missions are viewed from above, with the landscapes scrolling around your craft. Along with the destruction of enemy craft and buildings, missions include finding and retrieving certain objects. You can fight alone, or with or against others in a network game.

The system requirements are tough. The minimum requirements are inadequate. We recommend a Pentium 90 or higher with 16Mb RAM. You'll need a CD-ROM drive and 35Mb free on your hard disk.

You need Windows 95 and DirectX video drivers. There's no need to drop out to DOS for the ultimate performance. Fire Fight comes with DirectX drivers, but be aware they may not be compatible with your card.

Those who love basic shoot-em-ups with detailed colourful graphics and addictive gameplay will not be disappointed, but you'll need a quick machine to run in high resolution mode, and a DirectX-compatible video card to get the best from it.

Gordon Laing ■

PCW Details

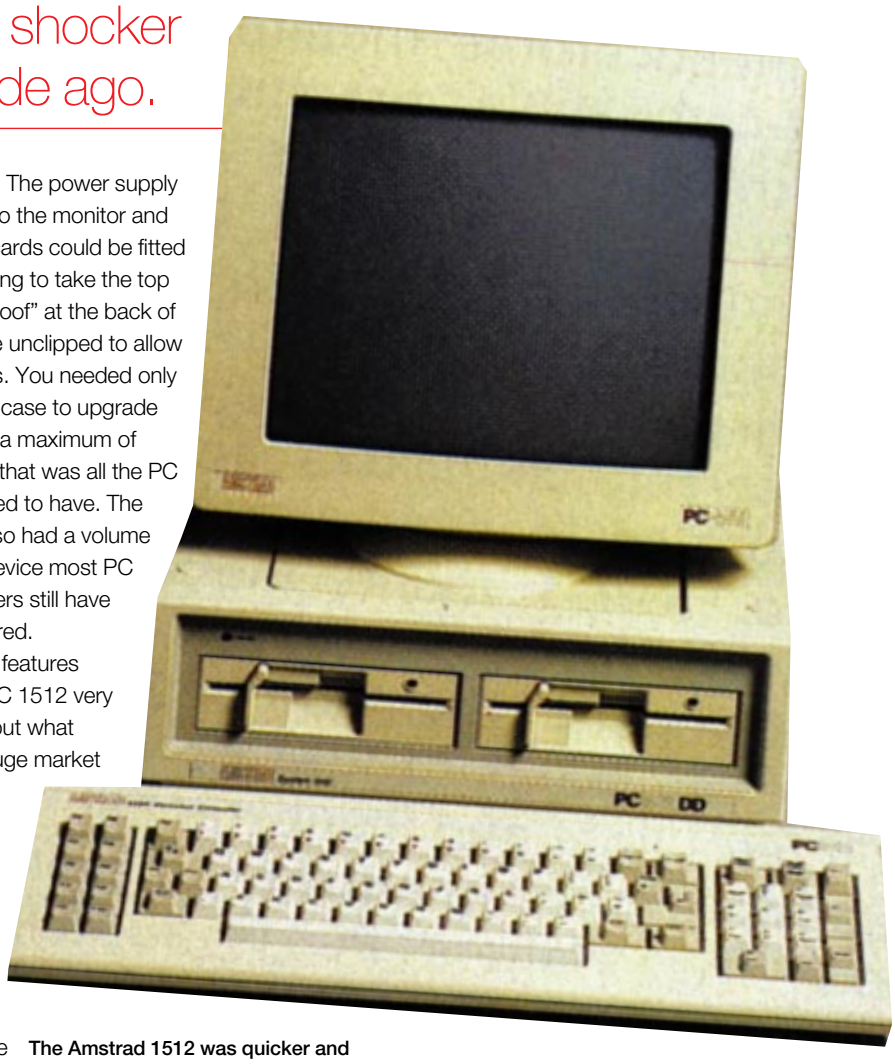
Fire Fight

Price £34.99 (Incl. VAT)
Contact Electronic Arts 01753 549442
System requirements Pentium 60, Windows 95, double-speed CD-ROM, 8Mb RAM, VLB/PCI video card.

★★★

Ripping yarns

The "Amstrad IBM Rip-Off" shocker which made a mint a decade ago.



The Amstrad 1512 was quicker and cheaper than an IBM PC

Imagine the reaction if someone were to launch a 133MHz Pentium machine with sound and CD for £399. That's less than half the going rate. Such a machine would rapidly become a market leader and other manufacturers would have to slash prices to compete.

This is exactly what happened ten years ago when Amstrad launched the PC1512. Of course, back then the technology was a little different. It was a mono machine (colour was available as an option) with a single floppy and a 512K RAM (10Mb and 20Mb hard disks were available). Sound was a single beep and CDs were what you used to listen to Duran Duran. Nevertheless, in 1986, it was a real PC for less than half the price of an IBM.

Looking through the advertisements in the issue where *PCW* reviewed the PC1512 reveals that a Compaq Deskpro with 256K RAM and twin floppies cost £1,447 while a pukka IBM XT was £1,178, but this did not include minor extras such as the video card, the monitor, DOS or even a keyboard!

The Amstrad came as a complete set of hardware and also had GEM, the Windows-like user interface, running under Digital Research's DOS plus. But for most people it was the more standard MS DOS 3.2 which was used. The version of BASIC supplied was Locomotive Software's BASIC 2 and the only application which came with it was GEM Paint, a very clunky program even in its time.

There were two mono screens: green and paper white, although colour was an option. The biggest limitation of the machine was that the video was on the motherboard and could not be upgraded. Sixteen colours was your lot, but beyond that it was a real stunner.

The PC 1512 was quicker than an IBM PC since it ran at 8MHz — even faster than an 8MHz XT — and had a number of mechanical innovations. Instead of the batteries (which provided power for the clock) being soldered onto the circuit board, they were in a crevice on the top of the system unit. The power supply was built into the monitor and expansion cards could be fitted without having to take the top off. A "sun-roof" at the back of the machine unclipped to allow easy access. You needed only to open the case to upgrade the RAM to a maximum of 640K since that was all the PC was designed to have. The PC 1512 also had a volume control, a device most PC manufacturers still have not discovered.

All these features made the PC 1512 very interesting but what made it a huge market leader, and allowed Amstrad to make vast fortunes while continuing to sell it for half the price of rival machines, was the technology. This was well-hidden because it was designed to operate just like an IBM PC. To the outside world, it was just the same but down at chip level something very special was going on.

The Amstrad PC 1512 wasn't built in the same way as computers are today, where a manufacturer buys a board from one of half-a-dozen Far East companies, puts it in a box, sticks a label on it, arranges a software bundle and then spends most of its time worrying about how to sell the things. The 1512 was designed by engineers, people who really understood what made a computer tick. And not just the computer but the signals inside, the buses and the bytes. It was this understanding which allowed them to take the existing hardware and re-design it to halve the cost. Its codename was AIRO (Amstrad IBM Rip-Off). Some of this machine's innovations will reappear on other models: we'll see easy expandability touted as an asset, external sound control and various other features but it's unlikely we'll see the same level of innovation again.

At the time, the PC 1512 was a watershed. It broke the hold of many larger companies and there were rumours of a dirty tricks campaign. Its successor, the PC 1640 (essentially the same machine but with more RAM), was rumoured to overheat because it did not have a fan and the case was plastic. Alan Sugar was as vocal as ever and said that although it didn't need a fan, he would fit one "and they can have pink spots if they want those". After that, some machines within Amstrad *were* adorned with little pink stickers.

Simon Rockman ■

Brainteasers

Quickie

No prizes, no answers. Three circular coins are placed flat on a table so that each touches the other and their centres form a right-angled triangle. Assuming the radius of each coin is a whole number, what are the smallest sizes that the coins may be?

Prize Puzzle

Last October, on the island of Septerra, four friends, all keen cyclists, decided to go for a bicycle ride on the coastal road which runs all the way around the island. Each rider started from his own home at exactly the same time and rode at a constant speed non-stop around the 777 gallimeter circuit.

The first rider, who has a house at the side of the circuit 7 gallimeters from the Baron's mansion, cycles at 17 gallimeters per minute. Each other rider lives 10 gallimeters further along the circuit and cycles 10 gallimeters per minute faster then his immediate predecessor.

The ride continued for as many laps of the circuit as were needed until all four riders were side-by-side, at which point they found themselves directly outside the Hare and Hounds public house. So they decided to end the ride there and then and go in to the pub for a well-earned drink.

How far is the Hare and Hounds from the Baron's mansion?

Answers on a postcard or the back of a sealed envelope (no letters and no floppy disks, please) to: *PCW Prize Puzzle October 1996, P.O. Box 99, Harrogate, North Yorkshire HG2 0XJ*, to arrive no later than 20th October, 1996.

Winner of the July 1996 Prize Puzzle

As we thought, this puzzle was rather easy, although the response wasn't overly high — about 120 replies. Maybe people thought it wasn't worth sending in!

The answer was 21978, which is the only five-digit number with all digits different, which is a factor of the number formed by reversing the digits.

The winning entrant, chosen at random, was Mr Bill Martin of Crawley, West Sussex. Congratulations, Mr Martin, your prize is on its way.

The usual pep-message to all the nearly-dids — keep trying, it could be your turn next.

Good luck!

JJ Clessa ■

Computations

Taking the initiative

Have you ever heard of strategic government business policy? The Taiwan (Republic of China) government has designated software for strategic development. Back in 1993, the nation's Institute for Information Industry initiated a Five-Year Software Industry Development Plan, to help the nation's software producers improve their competitiveness and increase their production value to US$3.5 billion by 1997. Because of the language barrier, that's virtually all domestic sales. The British government, of course, does not believe in such initiatives.

The open secret

When will the scale of hacking be revealed? The corporate world is terrified that the truth will come out and expose huge business organisations as information sieves. Banks are shelling out fortunes in an attempt to prevent money and secrets from haemorrhaging. The biggest personal business fortune in Britain has been made in computer so-called security, and vulnerable networks are continually becoming bigger and more exposed, with share-dealing going electronic in the City. Every day, on average, 71 attempts to hack into the Pentagon's system are successful. And 10,000 users on Cambridge University's biggest network had to change their passwords recently after a sniffer program was found running on the Ethernet, giving access to personal files and email for over a month. Just another pointer to the self-sharpening pencil of the future.

■ **Source: US General Accounting Office/US Pentagon/*Cam* magazine**

STATELLITE

It finally happened. Factory wages are lower in South Wales than in South Korea.

■ **Ronson plc (L8-10K/L10-12K)**

Puff

Corporate spin-doctors must hail it as one of the great coups of the environmental era. Aerosols were deadly planet-wreckers one year and squeaky clean the next. Britons are now dumping more than 2.8 million aerosol cans a day — a stack about 280Km high. And for some reason (I can't face hearing their brainless explanation) German toxic household insecticide aerosol production runs at nine million, against a British rate of 30 million.

■ **Source: BAMA (average 10cm)/FEA**

Fossil fuel fiesta

Did you know that in Venice in 1980 the Government, along with the six other major fossil-fury countries, agreed to try to halve oil consumption? Since then, Britain's oil-burning road shipments of freight have, er, increased by 60 percent.

■ **Source DoT (UK)/Chronicle of the 20th Century, 1994 London (23rd June, 1980)**

STATELLITE

Insurance claims for stolen computer equipment are running at £790,000 a working day: the equivalent of over 500 powerful laptops. It's three a minute, round the clock, but is that much?

■ **Source: The Association of British Insurers**

Rowland Morgan ■

Personal Computer World's Preview of Live '96

If you want to see, hear and play with the latest in consumer electronics, get ready for LIVE '96 — Europe's leading consumer electronics show. Running at Earl's Court between 25th and 29th September, it's the place to get your hands on tomorrow's technology, today.

This year along with the usual attractions the organiser, Blenheim, has created a special feature, PC LIVE, to cater for the huge increase in demand and interest in home computing. Here you'll be able to see the latest products for the PC, meet the experts who created them and get your questions answered.

As usual, the manufacturers are playing their cards close to their chests about exactly what will be on display. However, to give you some idea of what's in store, last year saw over 180,000 visitors and the launch of some of the most interesting and innovative products on the market today: Windows 95 started up, Olivetti's Envision came on view for the first time; and Sony's ever-popular Playstation and a genuine 3D TV from Sanyo, both saw their début at LIVE.

Among the top exhibitors at PC LIVE will be Microsoft, with the latest versions of its award-winning Encarta and World Atlas titles for Windows 95. Olivetti, Packard Bell, Psion, Sanyo, America On Line, Europe On Line, Uunet Pipex, IBM, Creative Labs and Demon Internet will also be there. Sony will be at the show, too, and rumour has it that its brand new multimedia home PC, recently launched in the US, may well get its first UK airing at LIVE.

The internet will feature heavily, and you can see the latest online by taking our Superhighway Walk.

But LIVE '96 is not only about new products — it's also about having fun. There will be a whole host of features designed entirely for your pleasure. For instance, you can try your hand at being a disc jockey as Capital Radio will be at the show with all the technology in place for you to design your own jingle and try your luck at schmoozing the airwaves.

Perhaps you've always fancied yourself as a TV news presenter? Well you can do that, too. BBC Newsround will be there with the Newsroom of the Future. Newsround will be broadcasting live from the show but you will have the opportunity to appear in front of the camera to be captured for all eternity.

Or you might like to spot celebrities, rather than be one for a day. You'll have plenty of opportunities as LIVE '96 has nominated NCH Action For Children as its appointed charity for the show. NCH will arrange for a whole raft of celebrities to visit its stand at Earl's Court to help raise funds and add to the excitement.

Running alongside LIVE the same weekend is ICE '96, the In Car Electronics Show, which puts on a display of the most astounding array of hi-fi for your car. The show will also play host to the final of the Maxpower/SCA Sound Off Series competition, and the longest limousine in the world — 21 metres of sheer unadulterated luxury. It even has its own Jacuzzi in the back.

LIVE '96
HOME ELECTRONICS & ENTERTAINMENT
EARLS COURT • LONDON
25 - 29 SEPTEMBER 1996

LIVE '96 Show Details

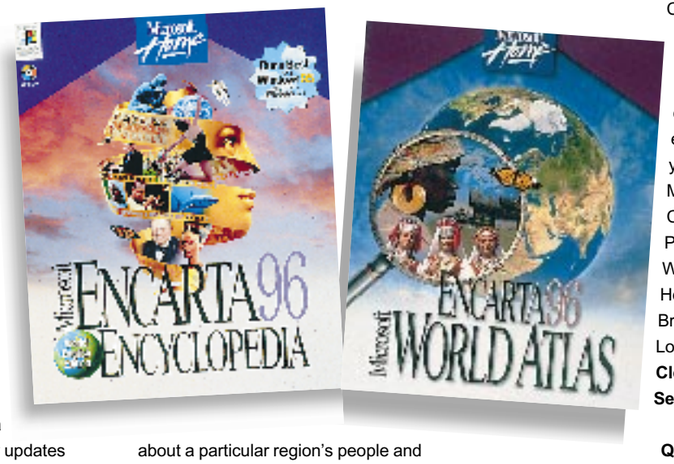
Dates:	25th September - 29th September
Times:	10am - 7pm every day (late night opening on Thursday until 9pm)
Place:	Earl's Court - One and Two
Tickets:	Adults £9 Children £5

● For tickets in advance, call the ticket hotline on 0171 396 4545.

Don't get left behind: be one of the crowd at LIVE '96 this month at Earl's Court

Competition

To get the ball rolling on LIVE '96 we have ten copies of the award-winning Microsoft Encarta 96 multimedia encyclopedia and its companion product, Microsoft Encarta 96 World Atlas, to give away.



Encarta 96 Encyclopedia contains over 27,000 revised articles and allows the user to take a trip through a vast universe of knowledge which comes to life in front of your eyes. Encarta 96 is the most comprehensive encyclopedia in the world and with monthly updates available on the World Wide Web and on MSN, you can be sure it is always up to date.

With more than one million place names, Encarta 96 World Atlas offers the most comprehensive geographical information of any world atlas, whether print-based or computer-based. Users can select almost any view of the world, from an aerial height of between two to 50,000 kilometres, and explore the world behind the map to learn about a particular region's people and culture. Experience the world as it really is — round, not flat!

These well-designed multimedia titles have been adapted and updated to create an ultimate reference source for all the family. The stunning animation, videos, maps, charts, sounds and pictures take the effort out of learning and make it fun for all the family.

For a chance to win these Windows 95 CD-ROM titles, just write your answers to the questions below, on a postcard or the back of sealed envelope, and return your entry to: Microsoft LIVE '96 Competition, Personal Computer World Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. **Closing date: 29th September.**

Questions:

1. Name the six wives of the English king Henry VIII.

2. What is the capital of Outer Mongolia?

3. Microsoft will be launching a horde of new entertainment products at LIVE '96. Name three of them.

■ *This competition is not open to employees of VNU Business Publications, Microsoft, Blenheim or their families.*

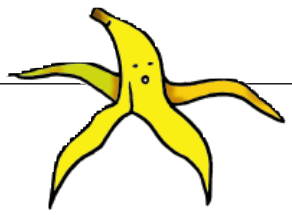
■ *PCW advertisers please note: if you would prefer to appear under alternative categories, ring 0171 316 9500*

Chipchat

Big Foot

PCW readers Jake Wood and Tom Saxby were enjoying a drink in The Ship close to *PCW*'s offices when they spied former *Cutting Edge* editor PJ Fisher sporting his bright red Big Foot polo shirt. Taken with the internet-related apparel, they approached him and asked where he got it. "Dontsch ya woory boysch, I'll get ya one each — they're very good friensch of mine," the long-haired editor replied. He scribbled down their names and addresses and stuffed the bit of paper in his back pocket and returned to play air guitar to his favourite Pearl Jam track. Recalling the incident the following day, he realised that the shirt in question was only available in the US and was part of a limited edition, now impossible to get hold of.

If either Jake or Tom would like to get in touch with *PCW* we will give you a special *PCW* free gift by way of compensation. And PJ Fisher won't be promising any item of clothing to anyone in a pub — ever again. And that's a promise.



Oops!

- In last month's group test of scanners, the Logitech contact number was printed incorrectly. It should be 01344 891313.
- In this same ill-fated scanner group test, the photos for the two Primax document scanners were mixed up. It was certainly the Primax Photo Organiser that won the coveted Editor's Choice award but it's the Primax with the plastic bit sticking out the side, not the one without anything sticking out the side, if you see what we mean.
- In our recycling feature (*A new lease of life*, *PCW* August), we incorrectly stated that "The Computability Center welcomes old computer equipment" — it would like us to point out the fact that it doesn't.

True Tales Of Technical Support

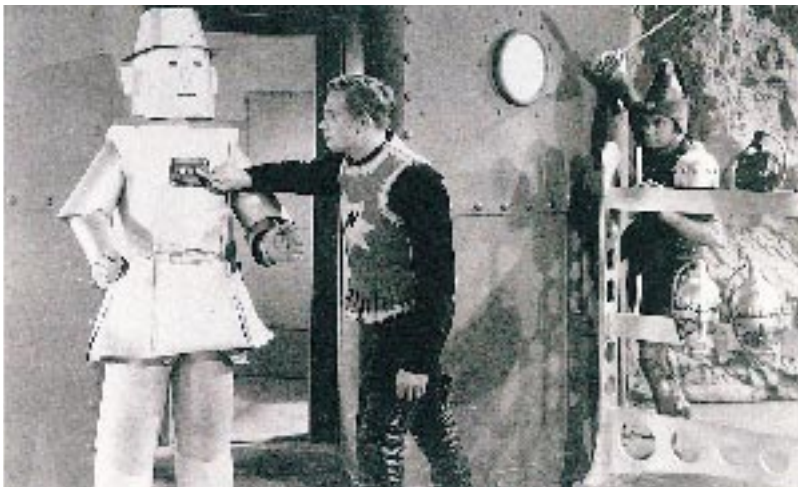
User: I can't log on to the system today. The modem won't connect.
Support: Look at your modem and tell me which lights are lit up.
User: I can't do that.
Support: Well, I can't help solve your problem unless you can describe what's happening. Can't you look at the modem and tell me the status?
User: No, I can't do that.
Support: Why not?
User: The modem is down in the basement.
Support: So, why can't you go down and look at it?
User: Are you kidding. There's six feet of water down there!
Support: Computers don't work under water.
Amazed user: Really?

■ Our thanks to Steve Oualline, programmer extraordinaire.

Are you being served?

PCW's balding-but-still-young new features editor, Gordon Laing, was intrigued by a large box that arrived one morning from Dell. The packaging suggested that something delicate was inside. And indeed it was. For there, buried among the bubble wrap and polystyrene chips was this fine cardboard waiter holding aloft an invitation to the launch of Dell's new server range. Gordon, a keen environmentalist, was so shocked by this waste of the earth's resources that he felt compelled to turn down the invitation. Until, that is, he noticed that the launch included dinner at Mosimann's, one of London's finest restaurants… and off he went.

Caption competition



KOBAL COLLECTION

Taking no chances, Bill Gates welcomes Marc Andreeson to his house of the future

Think you can do better? Email pjfisher@vnu.co.uk or write in to the usual address with your own captions on a postcard marked "Caption Compo" before 18th October. We'll print the funniest entries and the winner will get a £20 book token.