Personal Computer World

No-nonsense Buyers Guide p326

www.pcw.vnu.co.uk

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Reviewed: MacroMedia Flash, DVD Drives- Toshiba & Hitachi, Delphi3.0

9 770142 023069 04

On the CD: MS Development Network, Sega Rally, Ultimate Soccer Manager 2

CANON'S PC REVOLUTION

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The place in *PCW* where you can compare prices on a wide range of hardware and software. The card insert at page 341 marks the start of the section.

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Universal Control Systems	384/5
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Editorial

For this month's PC Group Test *(p134)* we have taken a bold leap into the uncharted waters of the PC bargain bins. Being something of a first for us, we weren't too sure what we would end up with as our specification laid open our test pages to brands which would be new to *PCW*.

There continues to be a school of thought which suggests that the only PCs worth buying are those with the letters I, B and M inscribed upon the fascia. There is some truth in this: major brands such as IBM, Compaq, Dell and others do tend to use better-quality components and pay more attention to the standard of construction, inside and out. They also cost more.

This is why buyers often turn to the ranks of the clone makers where they believe a similar-performance PC is available at a fraction of the cost. Such PCs are easy to make — all the components are available off-the-shelf and anyone with a corrugated iron shed on a windy industrial estate can set themselves up as a PC manufacturer. The trouble is that all too often, these manufacturers source poor-quality components to enable them to pare away the price of a PC to the minimum. They also care little for internal layout, expansion or general design, so what buyers gain in initial savings, they may lose in downtime and repairs.

Perhaps there is cause for optimism however in our Group Test results. It seems that you can get a decent machine with a Pentium 133MHz which performs well, is well built, and could last beyond the normal life cycle of a business PC. This proves that with care, attention to detail and a little forward thinking, a genuinely good PC can be built at aggressive prices. In other words, PCs that have been *designed*. These companies could become the Compaqs and the Gateway 2000s of the future. It seems such a simple lesson; the real wonder is just why so few manufacturers bother to learn it.

Of course, properly structured long-term tests would be needed to discover just how well these machines serve on a daily basis. But rest assured, *Personal Computer World* will endeavour to find out.

PJ Fisher

Managing Editor

Next Month

VNU European Labs place 166MHz MMX Pentiums and 17in monitors under their intense scrutiny.

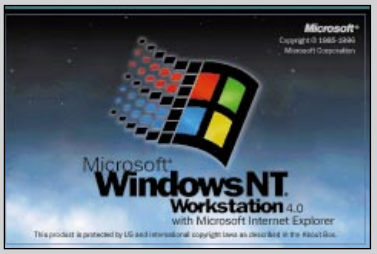
MMX PCs

P166 MMX PCs: Could this be the new business standard? Dylan Armbrust takes ten to task.

17in monitors

Gordon Laing presides over our 28-monitor supertest and sorts the sharp from the soft.

Operating Systems: Special Report



Which OS is best for you? Our 15-page report looks at the state of the art for the desktop.

Plus...

Desktop Publishing Group Test

May '97 issue
■ On sale Thursday 3rd April

June '97 issue
■ On sale Thursday 1st May

** Next month's contents subject to change.*

Personal Computer World

April Cover disc

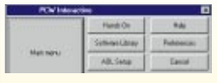
Introducing issue 8 of our new-look *PCW* CD-ROM. The disc is packed full of games, multimedia, music, hints and tips, and resources to download to your hard disk.

The CD is divided into nine sections, each with its own icon. Each of the nine section buttons is almost always visible on-screen so you can move from section to section just by clicking on that button, rather than having to continually return to a home page. If you are not sure where each section is, roll over the buttons and the name of that section will be displayed along with a contents list for the section. Exit the disc by clicking on the "Q" in the bottom left of the screen.

Arts

An interactive Jukebox containing the track Alive by Triggerfish and thirty-two 24-bit colour images from the Image Bank.

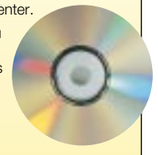
How to use the CD-ROM



1. Quit existing applications.

2. Put the disc 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, Video for Windows or Acroread with search plug-in installed, you will be offered the chance to install them before continuing.

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.

Possible CD-ROM problems

1. If you have launched Acrobat reader in the Hands On section and cannot find the search icon described in the first page of notes, this may be because you already have a copy of Acrobat reader on your C: drive, so the autostart for this cover disc 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 the disc to: TIB plc, TIB House, 11 Edward Street, Bradford DB4 7BH, for a free replacement.

■ For other problems concerning the CD, call 0891 715929. Calls cost 39p/minute off-peak and 49p at all other times. (From 19th February all calls will cost 50p/minute.)

Games

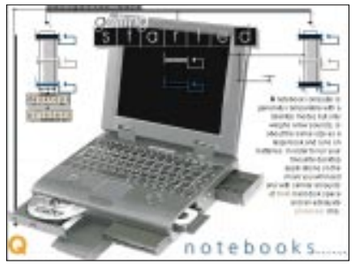
Here you can preview the featured games on this month's CD. Some you can play straight away, others you'll need to install first or can only play from DOS.

CD Index

A searchable database of the *PCW* cover disc contents since September 1996.

Getting Started

A beginner's interactive guide to notebooks, printers and desktop PCs.

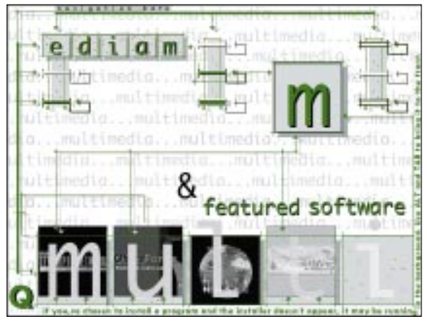


Hands on

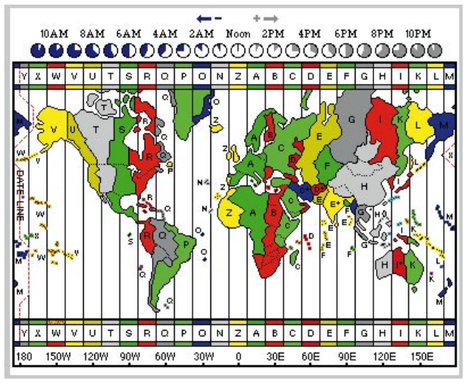
Install and launch "Acrobat reader with search plug-in" to view and search *PCW* Hands On articles from the past year.

Multimedia

Four interactive Windows demos for you to enjoy.



Floppy disk



This month's *PCW* floppy contains three programs. **Anno Domini V4.02** is a calendar/almanac program, designed to accompany the many personal information manangers (PIMs) on the market. **MahJong** is a PC implementation of the popular Chinese game. **Animouse** lets you change your Windows cursors for a selection of amusing and artistically creative arrows, hourglasses and sizer arrows.

■ To install the programs onto your desktop from the floppy disk, put the floppy into the drive.

Windows 95

Click on START\RUN from the taskbar. Type into the box a:\PCW0497 and click OK.

Win 3.11

Go to FILE\RUN on PROGRAM MANAGER. Type into the box a:\PCW0497.EXE then click OK.

■ To install the programs from the CD:

From Windows Explorer or File Manager, double-click on PCW0497.EXE in the directory <CD Drive>/FLOPPY/.

This will create a directory on your hard disk called PCW0497* which will contain the sub-directories Annodomi, Animous and MahJong.

Anno Domini V4.02 (Windows 3.X and above). To set up this program, double-click on C:\PCW0497*\Annodomi\Ad_402.exe

Animouse (Windows 3.11 and Win 95). To set up this program, double-click on C:\PCW0497*\ Animous \ Animouse.exe

MahJong for Windows 95 (Win 95). To set up this game, double-click on C:\PCW0497* \ MahJong \ setup.exe

(*default directory name)

Possible problems with the floppy

■ If you have problems with the floppy, such as the message "cannot read from drive a:", please return the disk to TIB plc, TIB House, 11 Edward Street, Bradford BD4 7BH, together with a 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 having checked it first.

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Cover disc notes

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

Browse through VNU's re-designed web e-zine called The Room, and see the first winning entry for the "Write an episode for the Stoney Blokes cartoon" competition.

Browse through VNU's new e-zine, even if you're not on the web

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

Multimedia & Featured Software

To preview any of the multimedia demonstations, either drag one of the images along the bottom into the box in the top right corner, or double-click one of those images. This month the four featured software demos are:

Microsoft Development Network — A Visual Basic starter kit containing essential information including technical articles and re-usable sample code.

OfficeForms (Win 95) — Toplevel's latest forms package.

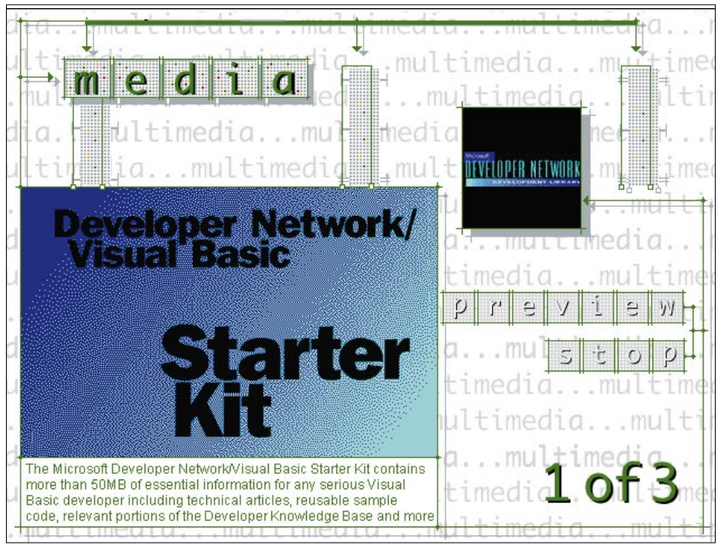
MultiMusic — A music sample resource, by Mantra, with song construction facilities.

Goldmine 3.2 (Win 95) — A contact management package.

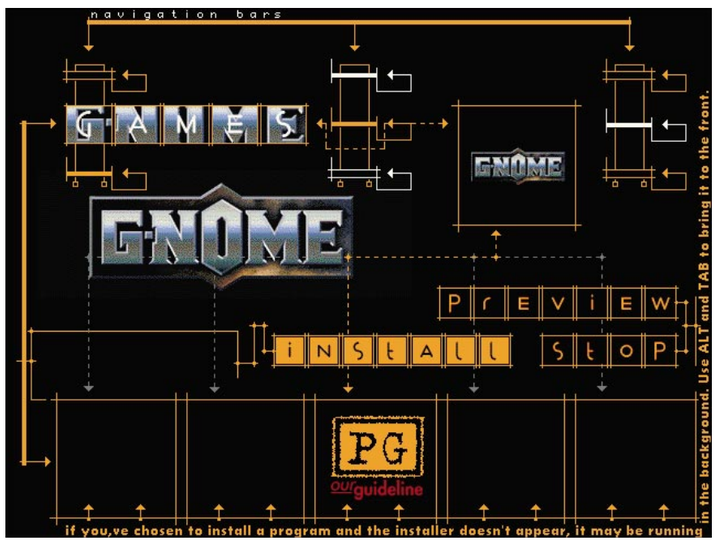
Error!

If you experience any problem running any of the Software Library programs once you have copied them from Netscape, please do the following:

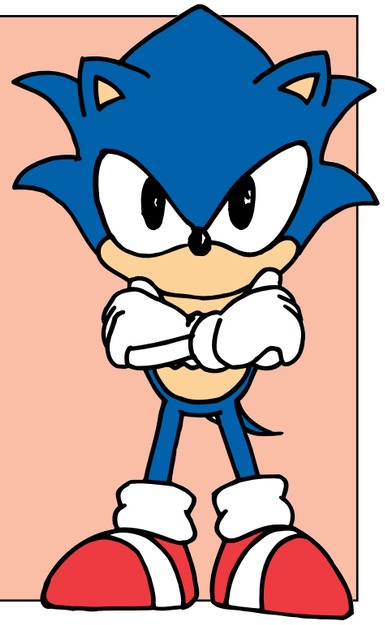
1. Delete the directory you copied them to.
2. Re-select them in the Software Library section.
3. Ensure that ONLY "copy" is ticked. That is, untick the box "decompress".
4. After copying the file, unzip it manually using PKUnzip.



Above Includes sample code amd technical help
Right A contact management package
Below Choose G-Nome — a futuristic destruction game



CompuServe CD



***PCW* and CompuServe — giving you more on CD**

CompuServe's latest cover CD contains more than ever before, including CompuServe 3.0.1 for Windows 95. For budding webmasters there's Home Page Wizard and HoTMetal Light so you can start building your own web pages to put up on CompuServe*.

When you aren't toiling away on your personal home page, there's demos of Sonic the Hedgehog from Sega and Syndicate Wars from Bullfrog Productions to keep you amused.

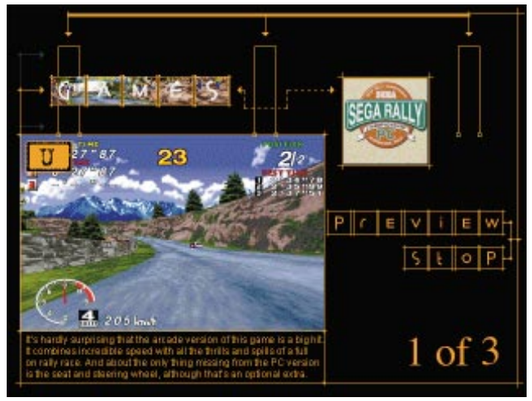
The CD also includes Superscape Viscape, SSEYO Koan Pro, CompuServe WorldsAway, Tesco Wine Selector and Tesco Recipe Selector.
(*To join CompuServe, follow the on-screen instructions.)

■ Following our competition with CompuServe and Air UK in the December 1996 issue of *PCW*, comgratulations to the ten lucky winners:

Phil Atkinson, Birmingham; Steve Fox, Warminster; Alec Whitfield, Hereford; Ian Rigg, Stockport; David Stout, Longstanton; Steve Ashton, Grimsby; Rhodri Evans, St Albans; Iain Duncan, Fife; Chris McCarthy, Birmingham, and Dave Griffiths, Bere Alston.

Please note: CD contents subject to change.

In Sega Rally, if you're stuck behind someone bang 'em out of the way and put your foot down!)



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.

Games

To preview any of the games, either drag one of the images along the bottom into the box in the top right corner, or double-click one of those images.

Destruction Derby 2 — This is the first of two fast driving-game demos included on this month's disc. Complete with realistic crashes, steep hills, jumps and banked corners, it plays as smoothly and excitingly as the original, and has a pit area for repairs.

Sega Rally — (Sorry Windows 3.1 users, Sega Rally is Windows 95 only). Sega Rally combines high-speed driving adventure with neat moves such as flying over jumps, sliding around corners and side-swiping other cars.

G-Nome — (Sorry Windows 3.1 users, G-Nome is Windows 95 only). G-Nome, by 7th Level, is a futuristic destruction game set on the planet Ruhelen. Union Sergeant Joshua Gant must assemble a team of experts and penetrate Scorp Republic to destroy the ultimate genetic soldier, the G-Nome, before that creature can be deployed in battle.

Ultimate Soccer Manager 2 — If you've ever fancied yourself as a football manager you'll love Ultimate Soccer Manager 2, by Sierra. Decisions range from drawing up plays that will be used during a match, to choosing what kind of merchandise is sold at your fan shops.

The Settlers II — The Settlers II is made by Bluebyte Software. It is a variation on the Sim City game and is set in the last century in a world of amazing colour and detail.

■ Fast Track

If you would prefer to play or install the Games and Multimedia demos from outside the main *PCW* interface, or want to know the location of the Software Library home page (in order to use your own internet browser rather than the default Netscape browser), click on the HELP button on the *PCW* loader. This help\info file also contains the locations of other items on the disc, along with a full contents list and help tips.

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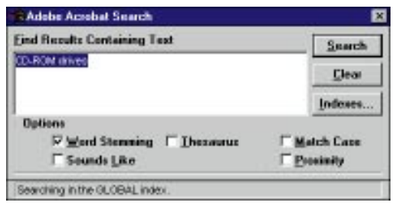
Using the Hands On section

You can 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 search icon. A dialog will appear. Merely type in the word you want to search for and click the icon. In a second or so, the search results dialog will appear containing a list of the files which contain 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, with your mouse, select the area of the page you want to magnify.



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

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

Please note:

Even if you have previously installed Acrobat Reader 3.0 from the Software section, when visiting our Hands On section for the first time you will be asked to install Acrobat. This is because in order to search across the PDF files, you need the search plug-in which is installed with Adobe Acrobat Search for CD-ROM, but not Acrobat Reader 3.0.

Using the Software Library section

The files in this section are copied to your hard disk using the default Netscape browser on the CD.

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

■ **Compressed Zip files or self-extracting archives**

Most files in this section are compressed zip files or self-extracting archives. Click on the file that you would like to copy to your hard disk. A box will appear, stating the name of the file to copy and the destination directory. Click on OK. If using the default browser, you will be given the option of:

1. Copying the file only, from the CD to a destination of your choice, with no further action.
2. Decompressing the files contained in the archive into the destination of your choice.

By selecting both of the above you can copy the file *and* decompress it into your chosen location. If you have to abort the copy, and subsequent attempts to download the same file give an unexpected filename, go to c:\vnu\netscape and delete the copy of the file contained therein. Next time you click on the hypertext link, the transfer should work okay.

■ **Other file types**

Click on the file you would like to copy to your hard disk. This will bring up the "save as" dialog box. Choose where you want to copy the file (make sure you don't try to copy the file to the CD itself, or you will get an error message). It's a good idea to create a directory or folder for it first (using Windows File Manager or Explorer).

Note: Avoid copying any of the resources files into your Windows directory or into the root of your C: drive.

Using Netscape

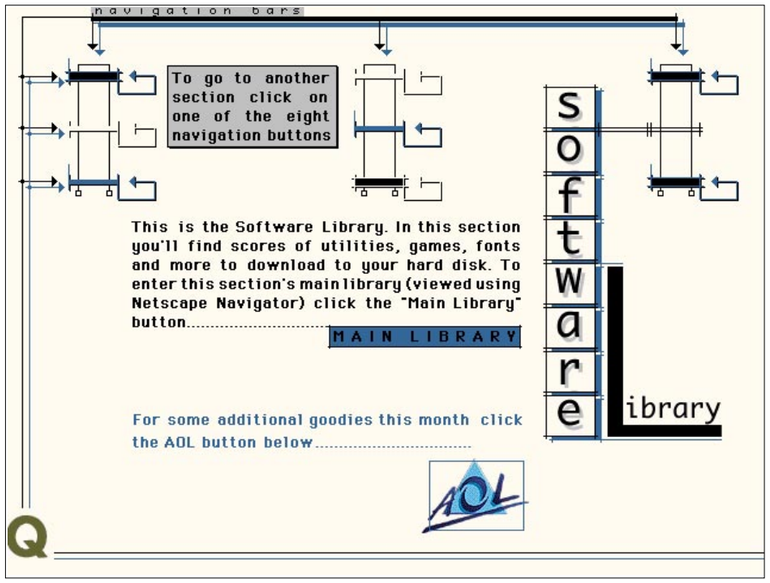
The *Personal Computer World* Interactive CD-ROM uses Netscape as the delivery mechanism for the resources section and to run The Room.

If you're on the internet, chances are you're already using Netscape and have a rough idea of 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 takes you backwards and forwards through different pages. You can also move between pages you've already visited by using the back and forward arrows on the toolbar.

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

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



All the goodies are here. From our *Hands On* section files to Goldmine, from an Alicia Silverstone screensaver to Netscape Navigator, Acrobat Reader and more. There's something for everyone

Installing PKUnzip or Winzip

Zip files are the standard compression format for distributing programs and utilities on the web and on floppy disk. If you choose to copy the resources zip files onto your hard disk and decompress them later, you will need to install PKUnzip or Winzip before you can "unzip" them. 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 platform and save it to a location of your choice. 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 save pkz204g.exe to 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 to 16 separate files (if you have chosen not to decompress and save it to your hard disk in one action).

■ **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.

April 1997

PCW INTERACTIVE

Entire Contents List:

Multimedia section
- Microsoft Development Network
- OfficeForms (Win95)
- MultiMusic
- Goldmine 3.2 (Win 95)

Games section
- Destruction Derby 2
- Sega Rally (Win 95)
- G-Nome (Win 95)
- Ulimate Soccer Manager 2
- The Settlers II

Arts section
- 32 graphic images from the Image Bank
- Jukebox containing the track *Alive* from Triggerfish

Getting Started
- A beginner's interactive exploration of notebooks, printers and desktop PCs

Office forms templates for MS Office
Alicia Silverstone screensaver
MSIE Cache Explorer offline browsing
Executive Desk personal info manager
Vet Anti Virus
Opera - cool browser
Destruction Derby 2
Anno Domini calendar
Kilkenny dice game
Full details page 14 April 97
Personal Computer World

Personal Computer World

CD Index
- A searchable index of the *PCW* cover discs since September 1996

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

The Room
- A browse through VNU's new redesigned e-zine, The Room

F O L D H E R E

Reference section
- 12-month products and features archivable database
- Advertisers' index
- General info on the CD
- Glossary of PC terms

Software library section
Including those files referred to in the *Hands On* section of *PCW*
- Acrobat Reader v3.0 (Win95/Win 3.11)
- Alicia Silverstone screensaver
- APOLLO — Mission to the Moon
- Avery Label templates
- Cachchk
- Chess
- Creative Writer
- Desktop Deluxe
- Direct X3.0
- Edesk 97
- Flash View
- FreeAgent V1.1
- GPS Software
- Icoholic
- Icons Control 95
- Images Control
- Internet Explorer 3.0 (Win95/NT)
- Kilkenny
- Lottery v4.10
- Magtrakj
- MicroAngelo v2.1
- 3D Movie Maker
- MSIE Cache Explorer
- My Personal Diary
- Netscape Navigator v3.0 (Win 3.x/Win95/NT)
- Odometer Win 95
- Opera
- PAYE-Master
- PDQ Lite
- Pegasus Mail for 16- and 32-bit
- PKZIP & PKUnzip
- Ponger
- PSP v4.12 (Win95)
- PSP v3.11 (Win3.1)
- Quake v1.01
- Qunck
- VBRun 100, 200, 300, 400.dll
- VETLite 3.11
- VETLite 95
- Video for Windows
- VistaCalc Spreadsheet
- *What PC?* — mobile pages buyers' guide for Psion 3a incl the new Nicholson London Pages
- Wincode
- Win95 PowerToys
- Win95 service pack 1
- Winzip
- Word Game

Wanted: material for *PCW* cover CD-ROMs

We are always on the lookout for material for our cover-mounted CD-ROMs. If you think you have something that might be suitable, such as software, pictures, fonts, demos and so on, please let us know: email Steven Rogers at stevenr@vnu.co.uk or write to him at CD Development, New Media, VNU Business Publications, 32-34 Broadwick Street, London W1A 2HG.
Please note that Steve cannot deal with technical support.

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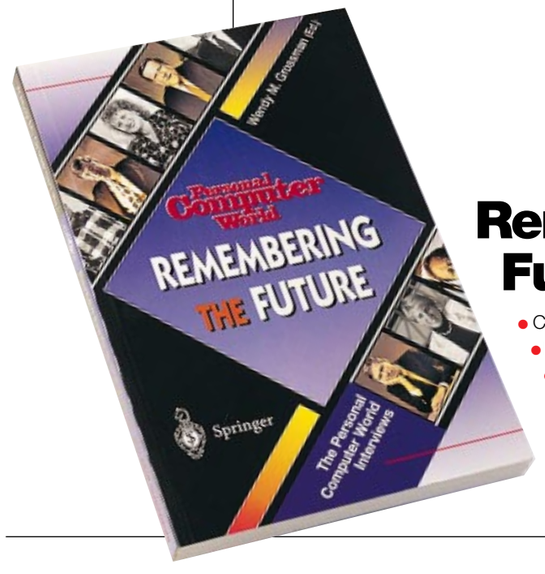

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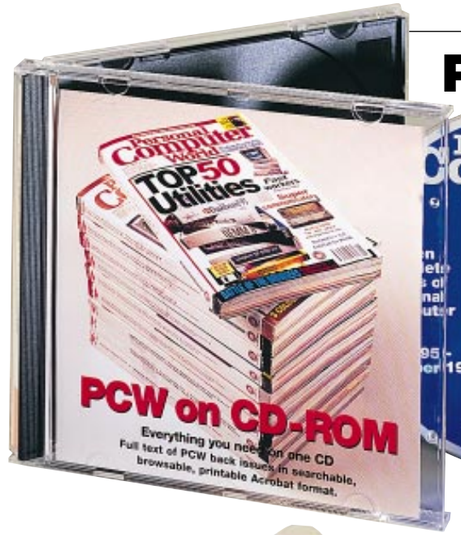

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Newsprint

Edited by Clive Akass. Send your news and views to news@pcw.vnu.co.uk

MMX upgrade chips on sale

Intel has launched MMX upgrade chips for 100MHz, 90MHz and 75MHz PCs.

They boost chip speeds to 166MHz, 150MHz and 125MHz respectively, as well as supporting MMX multimedia features.

The new 100MHz MMX overdrive chip costs about £311; upgrades for the other two speeds will cost about £250.

● Intel chief, p34

Boost for LS superfloppy

The chances of the LS-120 drive, aka the a:drive, replacing the floppy drive rose last month when Fujitsu and Siemens Nixdorf announced they would fit it in PCs.

Some Compaqs already use the drive which reads standard floppies as well as 120Mb disks.

The case for the LS-120 will be unanswerable if big sales drive down prices — already below £100 in bulk.

● See also, p38

Fourfold confusion as first x2 modems ship

Modem buyers face months of confusion with at least four technologies offering double-speed downloads — and not one is a standard.

The rival devices all run at 56Kbps only downstream from compliant service providers — not upstream, or modem to modem. US Robotics was first to announce a 56K technology, called x2, last year. *PCW* has just received its first x2, a Sportster Flash, for review but it requires a flash upgrade to work at 56K.

Pipex, which like most UK service providers says it will support USR, has also yet to upgrade its system to 56K.

USR claims a big advantage in that its later models are software upgradeable to 56K.

Rockwell, which sells most modem chips, is about to ship models based on its K56Plus technology. AT&T spin-off Lucent is due to ship its own V56Flex models.

Motorola, Rockwell and Lucent have agreed to merge these into a fourth design, called K56Flex, by summer. Earlier models are likely to need chip swaps. K56Flex is believed to offer uploads at up to 45K compared with USR's 33.6K.

The US industry will distill yet

● *Continued on page 32*

These two icons put the 56K modem debate into perspective. One shows a DirectPC satellite link capable of downloading at more than 800K. The other is a standard upstream phone net link.

It's the kind of interactivity that will soon become commonplace as digital TV satellite channels go live and cable companies respond with cable modems and boxes. So by the time a 56K standard is agreed, it may already be out of date.

Newsprint will be taking a closer look at these technologies next month.

● Smart NC links, p34

Cover story

Peter Gabriel's Eve CD won the prestigious Milia Gold multimedia award in France last month. See p41

First net bank faces doubt over ActiveX factor

The Royal Bank of Scotland has become the first in the UK to announce banking over the web.

When the service goes live in the spring, users will be able to print out account details going back six months, view standing orders and direct debits, and pay bills to more than 750 large companies. But doubts about security were expressed almost as soon as it was launched.

Hackers from the Chaos Computing Club of Germany showed on TV how Microsoft's

Active X technology can be used to rifle home users' bank accounts. Microsoft has long said that if you want ActiveX power there is a security risk, and you should accept only files bearing encrypted security certificates.

The Royal Bank guarantees to refund any money lost by customers who have used the service and kept their passwords secret. It already offers the same guarantee to its telephone banking customers.

In the long term, internet banking is expected to cost banks a fraction of conventional branch banking. But the Royal Bank plans to charge users £1.50 a month for using the service. One other catch is that you are tied to using the Microsoft Explorer 3.0 browser.

Ben Tisdall

www.royalbankscot.cop.uk

● See News Analysis, p43

Daily Mail stablemate acts as conduit for internet smut

A sister company of the *Daily Mail*, scourge of all sinners and arch upholder of family values, is acting in effect as a conduit for pornography.

Parent company Associated Newspapers has set up a web search engine called UK Plus, one of a new breed aiming to provide local information for UK users. It is well designed, with sites concisely reviewed by journalists, and makes a point of vetting out smutty pages.

But next to the UK search button is one for UK Plus's partner, the US search engine Infoseek, which can act like a pornographic hotline, negating the whole point of the vetting. A search on any smutty word provides a string of pornographic sites, the home pages of which include a stream of obscenities obviously aimed at attracting hits.

Infoseek says it vets its listed sites and so must be aware of their content, though it does not go as far as rival Excite, which even carries adverts *(above)* for a pornographic search engine.

Porn ad carried by Infoseek rival, Excite

Web watcher programs like Cybersitter can stop smutty searches, but there is no easy way for a search engine to do so without blocking non-sexual discourse.

Ironically, UK Plus's own local searches show that much can nevertheless be done. Executives at Associated Electronic Publishing, the newspaper group's online arm, reacted indignantly to the suggestion that they are channelling smut.

Mike With, UK Plus editor, said no other engine was so careful to avoid porn and he was proud to be associated with Infoseek because of its quality of service.

But he added: "We have no control over Infoseek policy."

Clive Akass

UK Plus www.ukplus.co.uk

Short Stories

Fast CD recorder

■ Yamaha says its CDR400 CD recorder is the world's fastest. It writes at four-speed, reads at six-speed, and costs £450 (ex VAT) complete with a 2Mb buffer.

Yamaha 01908 366700

PowerPC NT blow

■ Microsoft has stopped developing NT for the Power PC, it said last month. This means the MacOS and AIX will be the only operating systems supported until Apple's NeXTstep-based Rhapsody appears.

● Apple exodus, p34

■ This £115 (ex VAT) device from Lindy transforms your PC monitor into a TV.

Lindy 01642 765275

Disastrous news on the joke of the millennium

■ Time was when the millennium was linked with the Second Coming, hellfire, and Judgment Day. But the Year 2000 bug — code that counts dates only up to 99 — seems to have shifted the focus of fear from the apocalyptic to the algorithmic. Latest predictions include:

- US missile systems will fail.
- UK military systems may go the same way, even after a £100 million bug-fix programme.
- Planes will crash as satellite positioning systems go awry.
- Nuclear power stations will get catastrophically confused.

Oh yes, and if you survive that lot, you can look forward to a collapse of world IT systems leading to a global slump, says a new book called *The Millennium Timebomb* by Simon Reeve and Colin McGhee (Vision Paperbacks, £8.99).

Yet IT managers are having trouble getting extra funds to deal with the problem, according to a Year 2000 report from Softlab. Finance directors tend to blame the bug on IT managers, who are asked simply to redirect existing funds to sort it out.

Vision 0171 460 4684;
Softlab 0181 742 2277

'He reckons he's the fifth horseman of the Apocalypse. The first four brought war, death, famine and disease. He helped code the Millennium bug.'

p29 ➢

Buyers sniff rip-off in extended warranties

PC buyers are getting wise to the dubious value of some extended warranties, judging from a new report. But they are still paying twice as much for cover as continentals.

Charges at high-street shops can be nearly five times German rates, says the Inteco report. It singles out Dixons and Currys, where warranties cost respectively as much as 9.4 percent and 11.5 percent of the system price. The UK average is 5.5 percent.

Yet three out of four buyers have no problems in the warranty period — and problems that do occur tend to be software related, says Inteco. As a result, seven in ten second-time buyers refuse extended cover. And many are voting with their feet by buying via ads rather than from shops, Inteco senior consultant, Pete Day, warns.

"Certain channels are very good at persuading neophyte PC buyers to take out an extended warranty on their PC, but they can't rely on this forever. Less than 50 percent of the people buying home PCs are doing so for the first time," he said.

Country	Cost	Period
France	2.7%	1.8 years
Germany	2.2%	1.6 years
UK	5.1%	1.8 years

Average percentage cost and period of extended warranties

Buyers are right to balk at buying extended cover, says the government-funded National Consumer Council. They have wide legal rights to redress if faults occur in a "reasonable period".

Beyond that, "cover under an extended warranty often stops just short of the point where a machine is likely to start going wrong," a spokeswoman said.

Dixons said in a statement that its Coverplan, also sold at Currys, PC World and Link stores, offers unmatched benefits. "It is impossible to compare a warranty in the UK with one in France and Germany without knowing what level of service is offered," the statement added.

Inteco 01483 751777
NCC 0171 730 3469

Cherry ripe for reads

Cherry's latest keyboard includes a built-in reader for barcodes and magnetic swipe cards, so you can swipe someone's identity card to ensure they don't swipe your money.

Cherry 01582 736100

Short Stories

Mosaic browser owner Spyglass thinks small

■ Spyglass was the company that bought Mosaic, the mother of all graphical browsers, from the National Centre for Supercomputing Applications. The NCSA has just announced that it has stopped all browser development, as it can't compete with Netscape and Microsoft.

So whatever happened to Spyglass? Well, it owns part of Internet Explorer, which is based on Mosaic. And it is busy developing browsers for non-PC web devices. Now it has bought in former Palindrome exec, David Harris-Evans, to head up a new operation in Europe where he reckons there is a "huge potential for embeddable Web technology."

● New Acorn mini OS, p36

Spyglass 01753 705003

Netscape still leads

■ Netscape Navigator is still by far the most-used web browser. But Microsoft reckons its Internet Explorer is catching up fast, with a share of users rising from 8 to 28 percent in the last four months of 1996 alone.

4Mb palmtop

■ Hewlett-Packard is offering a £450 (ex VAT) version of its 200 LX palmtop with 4Mb RAM.

Hewlett-Packard 0990 474747

Domino knocks spots off the rest, says Lotus

Lotus's new Domino package *(reviewed on page 114)* provides almost all the internet and intranet functions needed by Notes users,

Lotus Development president, Jeff Papows *(pictured, left)* told the first European Lotusphere Conference here. But two products due soon, codenamed Lookout and Maui, will be additions to the Notes client.

Lookout will feature an updated and enhanced user interface and navigation "paradigm" that will integrate web products such as SmartSuite 97, Microsoft Office 97

From DYLAN ARMBRUST in Nice

and Internet Explorer. It is expected to ship in the late half of 1997. Maui will be the follow-on Notes client that will support a raft of new internet protocols, including IMAP4, LDAP, NNTP, IIOP and ICAP. Papows said this further enhancement was a continuation of Lotus's support of open standards-based clients.

Lotus also seems to be jumping firmly on the Java bandwagon with a preview of Kona, a set of Java-based applets designed for use over the web on a Network Computer (NC). There will be a full "suite" of applets, ranging from a word processor to presentation graphics, all with core application functionality to run on any Java-based browser, whether it's on a LAN, WAN, or internet based network. However, Lotus will continue to develop and enhance its full-featured application, SmartSuite.

Papows said that Lotus, in conjunction with its parent company, IBM, was refocusing on a network-centric strategy and that it planned to aggressively go head to head with Microsoft.

"Lotus has not been the *tour de force* that Microsoft has historically been" but Lotus/IBM "will spend WHATEVER [his emphasis] it takes" to keep and extend their lead in groupware, particularly in R&D, he said.

p31 ➢

RAM market steadies after prices Korea out of control

The cost of memory chips jumped by more than 25 percent in two weeks last month after a year which saw prices fall by up to 80 percent. The rise followed a decision by South Korean manufacturers, who account for 35 percent of the market, to cut output by around a third in a bid to push up prices. Prices levelled off but industry watchers are divided on the long-term view. US analyst Dataquest predicted further falls this year of up to 30 percent.

But Lianne Denness, MD of vendor Hypertec *(see left)* thinks prices will stay steady for a while and then rise slowly.

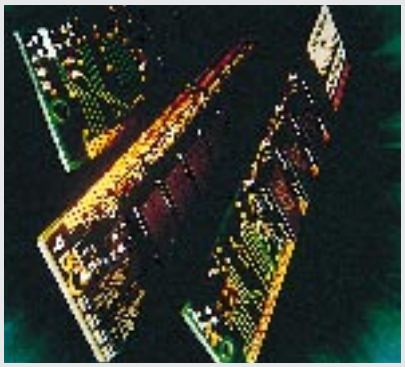
Prices of whole PC systems will be little affected unless there are dramatic RAM price rises. Small increases would be offset by Intel's regular processor price reductions.

The global glut of chips that pushed prices down is being eroded by a higher demand as users find RAM upgrades are the cheapest and best way to boost performance: 32Mb RAM is now regarded as *de rigeur* for MMX and NT machines.

Vendors in Europe last month waited anxiously to see if the EC would reimpose anti-dumping tariffs after an 18-month suspension due to end on 7th March.

John Byrne, of Vanguard, was hoping for tariffs to be imposed as they vary according to source, and his Taiwanese suppliers would not be affected.

Vanguard 01604 859542



Free memory insurance

Hypertec is offering free theft insurance on its Retrieve memory chips which are tagged to identify the owner. Stolen chips will be replaced within a day. Hypertec 01488 686844

Micrografx hits two suite spots

■ The message from Micrografx was clear: its new high-end graphics software packages are not meant to compete with Photoshop. It is interested less in the professional graphics market than in corporates where "Graphics Suite has been designed to work with Office 97," said David Whitewood, UK general manager.

However, the positioning of the products is not clear. A new web suite offers the same components as Graphics Suite 2.0 (now shorn of its ABC tag) less the enhanced FlowCharter, but costs around £140 less. Both include Picture Publisher 7, Designer 7, Simply 3D 2 and Media Manager 2.

But both packages contain advanced features. Vector graphics can be transferred to the web from Designer and 3D animations can be converted to animated GIFs from Simply 3D 2. VB scripts can be applied to objects created in Designer and used to create mouse-over events on web pages.

FlowCharter 7 now includes "living flow charts" where dynamic events can be programmed into the boxes on a flowchart, again using VB script. For example, a flow chart could be created that walks users through telephone canvassing procedures.

Micrografx also announced Small Business Graphics and Print Studio, designed to make stationery creation easy. **Paul Fisher**

Micrografx www.micrografx.com

Tim Bajarin reports from the US

■ The days when AST was a top five PC vendor are long gone. It has slipped out of the top 10 with a market share hovering about one percent.

Samsung bought a one-third share of the company and put in $350 million in late 1995, which kept it solvent. With AST still in trouble, Samsung brought its share up to 49 percent and demanded six of the 10 board seats. This still did not help.

Now Samsung has offered to buy the rest of the company for $465 million. It could gain control with just two percent more, but that is not the way Asian business minds work: control means 100 percent and no less.

Samsung could also have just walked away, but that would be admitting failure. Instead, it will put more money into AST to save face.

Ironically, AST management has not decided if it wants to sell and has passed the decision to an internal committee – though Samsung, with a majority on the board, has the final say. But AST has had another cash infusion and will be around for at least another year.

■ Systems using the new multimedia-enhanced MMX chip are already on the market in big numbers. The big news is that Intel has priced the 166MHz and 200MHz chips reasonably and PC vendors are following suit.

Hewlett-Packard and Sony are both offering the following system for $2,399 (£1,500): 32Mb EDO RAM, 4Gb hard drive, 33.6 modem, 16x CD-ROM, 256Kb pipeline burst cache, 2Mb video RAM, accelerated 3D video graphics, MPEG 1 for full-screen digital video, 3D, SRS surround-sound with subwoofer, phone answering system and two universal serial bus ports. Add the MM video monitor, and the whole system goes for $2,899.

The aggressive pricing shows Intel is serious about getting everybody on to MMX as fast as possible. Prices are higher outside the US, but here they are so low that researchers think upgrades and new purchases should put PC sales growth at about 18 percent in 1997.

p32 ➢

Short Stories

■ Micro Solutions has come up with a device to fill that nasty storage gap, while we all wait for DVD-RAM to happen.

The Backpack PD/CD acts like a hard drive, a backup device and a CD-ROM drive and uses rewritable optical cartridges, which should work in next year's DVD drives. Prices, with sound card, start from £539 (£438.72 ex VAT).
www.micro-solutions.com
Micro Solutions 001 815 756 3411

Lynley Oram

Class act for screens

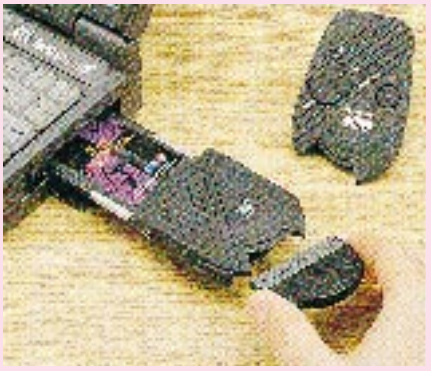
■ Keyzone is selling a range of Clasnet systems which allow teachers to scan all students' screens or project one screen on to all of them. The systems also allow a teacher to take control of a student's keyboard or mouse. Prices start at £895.
Keyzone 0181 900 1525

Samsung keyboard

■ Samsung has replaced the aluminium keyboard backing on the SensPro 500 with a steel backing. This should stop the keyboard bending when you type, as in the model we review this month *(p203)*.

Pace modems

■ The contact number for the Pace ISDN terminal adapter in last month's issue should have been 0990 561001. We apologise for any confusion.



Sanyo packs sound bytes

Sanyo's new Flashback Mobile Office digitally records up to 35 minutes of sound into flash RAM which it can then pack into 2Mb of disk space. The sound can be randomly accessed, speeded up with no change of tone, and sent efficiently over the net. The £399 (plus VAT) kit has three modules, each available separately: a recorder and memory (left), and a PC Card that downloads the memory to a laptop or PC (right).
Sanyo 0500 368080

Users face 'wait and see' game on 56K

● *Continued from page 26*

another spec out of all this, which may or may not be made an ITU standard next year. Hayes, Motorola and Microcom (which has just launched a nice-looking £140 33.6K voice modem) are all offering upgrade deals on modems bought in the meantime.

There are doubts whether any will work in practice. James Gardiner of Demon, the only major UK provider not to have backed USR, advises users to wait and see.

"We are not going to commit to a technlogy until we are sure it works," he said.

Bill Pechey, chief technology officer for Hayes Europe, also warns users to check what a provider means by x2 support. "It could be just a single 56K line."

Clive Akass

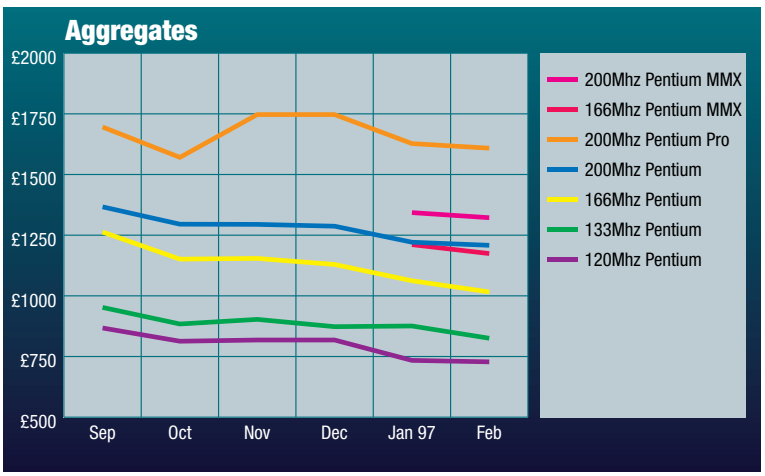
Hayes 01252 775500;
Motorola 01628 39121;
Microcom 01483 242800;
Demon 0181 371 1234;
Pipex 01223 250100;
Satellite Digital Systems (dealer; Direct PC) 01494 455466

Power bug in CE handheld

One of the new Windows CE palmtops has a problem which could lose data. Casio's Cassiopeia, due to ship here in July, does not power down properly when switched off.

All data is stored in RAM and so is vulnerable to loss of power. Casio technical support person, Scott Nelson, said Microsoft was addressing "a problem with power management."

A software patch was due to be posted on the Casio web site.
VNU Newswire



PCW price check

Price Check

These charts, based on average prices from major vendors, show the downward trend of system prices since last October. Some of the dips are due to fluctuations in memory prices. Intel also reduces some processor prices as it introduces faster versions. Over the next few weeks we will see the effect of MMX on prices of older Pentiums.

Chart based on figures supplied by Dan, Viglen, Mesh, Dell, Evesham and Carrera. Not all supplied all configurations for the whole period.

■ SYSTEM DETAILS: 120MHz, 133MHz prices include 1Gb disk, 16Mb RAM and 14in mon; 166MHz, 200MHz Pentium and Pro same with 15in mon; MMX machines, 2Gb disk and 15in mon.

p34 ➢

Intel parades its NC paranoia

You'd think a company which made $5.2 billion last year has little to worry about. But Intel is led by Andy Grove, whose motto is "only the paranoid survive", and he paraded his fears across Europe last month.

First he feared that Europe is falling behind in internet usage, a concern not unconnected with a wish to sell more chips here.

Then he was worried about the ease and cost of administering networked machines, and outlined a series of Intel answers.

This clearly had everything to do with the much hyped advantages of the network computer, which incidentally does not depend on Intel chips.

There was a curious subtext, spelled out in a *Fortune* article distributed to an invited audience of press and IT managers in London: we all need Intel to win.

The argument has force. Intel spends billions developing new chips and setting up chip fabs. Each generation finances the next, so if sales falter, so does R&D.

Moore's Law, which has computing power doubling every 18 months, could break down if everyone decided not to buy, say, MMX chips. That is, we might never get to play with the 400MHz Pentium Pro Intel showed off in San Francisco last month. **Clive Akass**

Siemens backs Wintel as Lotus lauds smart NC

Two giant companies straddled the network computer battleline last month. Siemens Nixdorf plumped squarely for the Wintel camp by announcing a strategy called user-centred computing based on Microsoft software, with its new emphasis on easy, low-cost administration.

It also announced a NetPC based on the cut-down PC that is Wintel's answer to the pure NC.

Meanwhile in Nice, IBM-owned Lotus was evangelising the Notes-powered intranet *(see p29)*, and showing an NC prototype good enough to impress *PCW*'s Dylan Armbrust.

Lotus reckons we will all carry around smartcards that allow any NC from Tooting to Timbuktu to download our familiar desktop. Goodbye notebook. Goodbye PC.

Far fetched? Well, I've been playing with a DirectPC satellite link that could download my system in the time it takes me to boot from disk.

The smart NC may not mean the death of the PC, but it shows why Microsoft and Intel have the jitters. **Clive Akass**

Lotus 01784 455445;
Siemens Nixdorf 01344 862222;
DirectPC 01494 455466

Mac execs leave and prices drop as founder Steves return

Key Apple executive Heidi Roizen resigned last month as Steve Wozniak joined co-founder Steve Jobs back at the troubled company.

Roizen, aged 38, was in charge of maintaining relations with software developers who are vital to the company's future. She insisted that her departure had nothing to do with events at the company. "I want to spend more time with my chjildren," she said.

Three other executives also quit, reportedly victims of a top-level reshuffle.

CEO Gil Amelio evidently hopes the two Steves will revive Apple's early flair, but the exodus will do little to cure a crisis of confidence after poor sales figures *(see below)*.

Apple cut the prices on its flagship PowerMac range by up to 25 percent, as new models were announced. And Motorola cut its MacOS-model prices by up to 33 percent and announced three new models, with the entry-level StarMax DT3180 starting at £869.

IMC, UK distributor for Mac cloner Umax, countered by bundling the Freehand Graphics Studio 2.0 suite with all its models.

Apple 0181 569 1199; Motorola 01628 39121; IMC 01344 872000

Now for the good news... Apple's latest PowerBook 3400 uses a fastest-yet 240MHz 603e PowerPC chip, built-in ethernet and modem link, hot-swap expansion modules and a four-speaker sound system

Falling Apple sales highlight gravity

Apple has for the first time in five years dropped out of the top five for US sales on Dataquest figures for the final quarter of 1996.

But it ranked fifth for the whole year, with 6.7 percent of the US market — down from 11.1 percent in 1995. Compaq stayed at number one with 1.03 million sales over the last three months and 3.4 million in all 1996.

US % market share last quarter

1	Compaq	13.7
2	Packard Bell, NEC	10.6
3	IBM	10.2
4	Dell	7.1
5	Gateway	6.8

Compaq also led world sales in 1996, with Apple in fourth place at 5.2 percent — down from 7.9 percent .

Much of Apple's slide was due to a lack of customer confidence, which CEO Gil Amelio highlighted in his Mac World keynote. Many corporate Mac sites have switched over to the PC and Windows 95 or NT rather than new Macs.

But Mac clone sales have risen and some analysts predict a rise to 500,000 this year. **Tim Bajarin**

Plug-in box frames future of video-editing appliances

A home-video editing suite shows a new direction in the convergence of computing and television. The £290 (inc VAT) Studio 2000 package from newsroom video specialist Pinnacle Systems comes with Gold Disk's VideoDirector package which Pinnacle bought last year for $4.5 million.

But the bulk of the video processing is hardwired into a modem-size box that plugs into the PC parallel port — no need to mess with expansion cards. Custom chips (ASICs) in the box contain a range of titling and transitions developed originally for systems costing up to $100,000.

You plug a video recorder and your camcorder (or a second VCR) into the box and the PC acts only as a controller, marking the start and stop positions of the edits and the transition type.

This is not as fast or as flexible as systems that store the video digitally on disk, but it does mean that you can use the system on a low-spec PC — a 486 with 4Mb of RAM and minimal disk space. Pinnacle plans a version using the fast 1394 serial port when that is generally available. And the hardware does not need to be in a separate box, so Pinnacle is talking with manufacturers about puttiing its ASICs into video recorders or camcorders which would plug directly into a PC (or PC/TV) via 1394.

Time for a change: a Pinnacle transition in action

UK vice-president, Brian Connor, said: "Most of the cost of ASICs is in research and development and we have recovered most of this selling our professional systems. That means we can now offer the chips at a price low enough for the home market."

Pinnacle 01895 442003

Mediamatics takes a hard line on DVD software playback

Two Microsoft alliances have also staked their claim on the future of PC video. Matrox has licensed to Microsoft technology to extend the Windows ActiveMovie 2.0 programming interface into the professional market.

The enhancements could help speed the defection of high-end video products from Apple to NT.

The second alliance is with Mediamatics, which will bring MPEG 2 playback from the emerging Digital Versatile Disk (DVD) technology. This will in theory allow software-only playback. But Pier Frate *(above)*, Mediamatics' VP of marketing, said that even MMX Pentiums are not fast enough for a full-quality display, for which an extra chip costing about $35 would be necessary.

Mediamatics' DVD Express audio and video players are already available to manufacturers from Surrey-based Britcomp. But Frate warned that copyright rows were likely to delay DVD for some months.

● Matrox has cut the price of its Mystique accelerator by 25 percent to £109 (ex VAT) with 2Mb of RAM or £139 with 4Mb. Video capabilities can be enhanced with the Rainbow Runner plug-ins.

Matrox 01793 614007
Britcomp 01932 347077

Short Stories

Psion buys customers with real gold

■ Psion Dacom has come up with a nifty way to push its latest PC data card: the first 25,000 off the production line have been plated in real gold.

The Gold Card Global fax/modem card, configured for V.34 modem operation, has PTT approval in twenty countries and optional support for most handsets, including Nokia, Panasonic, Alcatel, AEG, Matra and NorTel.

All GSM networks from 900 to 1900 are supported and there is 2Mb of flash memory to ease upgrading. Prices start at £209 (£245.58 inc VAT), Nokia upgrades cost £159 (£186) and other GSM upgrades are priced at £139 (£163). **Lynley Oram**

Psion Dacom 01908 261 686

IT departments ignore Monetary Union

■ The political storm over European Monetary Union has not alerted UK businesses to the impact the scheme will have on IT systems — whether or not Britain joins. Fewer than four in ten (38 percent) have begun preparations, according to a Micro Focus survey of delegates at a recent seminar. Nine out of ten could not say how long it would take to EMU-enable their systems, but estimates that were provided ranged from 15 months to five years.

Micro Focus 01635 565272

Luxury screen

■ Viewsonic will launch this 14in active-matrix monitor at Cebit next month. Maximum resolution is 1024x768 at 75MHz refresh.Yes, we want one too, but these devices don't come cheap. Most are sold to City dealers with more money than desk space.

Viewsonic 01293 643900

Smoke signals

■ More that 1,000 stylish ways to get cancer can be found at www.cigaraficonado.com. The eponymous US cigar magazine claims to have a 400,000 circulation worldwide.

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Short Stories

■ Bannerbridge says its £1,095 Signature is a fast and cheap way to print designs on CDs.
Bannerbridge 01628 419101

Cut-price notebooks

■ Morgan's is selling 120MHz Pentium Fujitsu Lifebook notebooks with an 810Mb disk, 8Mb RAM and a six-speed CD for £1,100 (ex VAT).
Morgan 0171 255 2115

Get a-life

■ The Cybertation artificial life engine featured on Notting Hill's Evolution of Life CD can bedownloaded from
www.nottinghill.com/cyber

New Acorn mini OS

Acorn and has announced a new operating system targeted at the next generation of smart appliances.

The Gallileo OS will compete with the likes of Psion, Microsoft and Diba for a potentially huge market as smart appliances, ranging from email phones to web TV, challenge PCs as the most common computing devices.

Microsoft's Windows CE is an attempt to establish the Win95 interface in this area. Psion is working on a 32-bit version of its EPOS operating system

Galilleo will run initially on RISC processors from Acorn sibling ARM. But spokesman Kevin Coleman said it will port easily to other RISC processors. "We are not going to be precious about this. We will use anybody's chip," he said.

Galileo includes a quality assurance function which guarantees system resources to critical tasks.

● Toshiba has developed a Java operating system called JVOS for Intel-based PCs. It will be available in the autumn.
Acorn 01223 725000;
Toshiba 01932 828828

Cold and Husky

Husky's new FS/3 PC is powered by a 25MHz 386 chip but that is plenty fast enough for the kind of data entry and collection tasks for which it is designed. And it will perform them in conditions in which your PC would turn on its back and die.
Husky 01203 604040

nCipher promises fast secure sales for web

CAMBRIDGE start-up nCipher's prototype encryption product caused quite a stir at the recent RSA Data Security conference in San Francisco. Fastness, brainchild of brothers Dr Nicko and Alex van Someren, promises 300 secure transactions per second, putting paid to the joke about RSA standing for "really slow algorithm" (the acronym actually stems from Rivest, Shamir and Adleman, who devised the notoriously slow RSA public key encryption algorithm).

Marketing director Carol Atack said the firm has had very promising talks with banking and mail-order companies. "Things are looking very exciting and shortly we will be issuing test products of the Fastness hardware accelerator to financial institutions and companies whose businesses involve transactions across the internet."

Fastness is a low-priced add-on board for servers which accelerates RSA computations needed for SFL and SET transactions on the internet. Encryptions involve unhackable 1024-bit numbers and a typical unaccelerated server manages just 10 a second — a claimed 30 times slower than Fastness.

"By having our product plugged in, companies are able to offer secure services and at the same time know they are not slowing down the server," said Atack. nCipher is exhibiting Fastness at Infosecurity at London's Olympia at the end of next month and is taking on programmers and technical marketing staff (see www.ncipher.com).

Fen Watch

Caroline Swift continues her reports from Silicon Fen

Sibelius Software

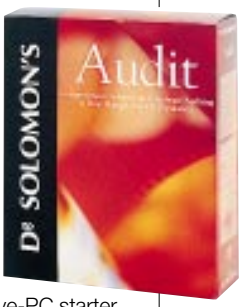
■ Also expanding is Sibelius Software which last month collected a British Computer Society IT Award for its music program, Sibelius 7. Here another pair of brothers, Jonathan and Ben Finn, are partners in a growing empire that includes offices in Los Angeles and dealerships worldwide. They took one of the top awards for what is essentially a word processor for composers. It runs only on Acorns (see developsibeliwww).

■ PSINet, the second internet service provider to set up headquarters in Cambridge, home turf of UUNET Pipex, claims to speed up links for the small office/home user with the launch of PSILink at the end of February. The interface is suitable for those working from home or remote sales people who want easy-to-use software on unclogged lines.

PSINet's lines are monitored closely to avoid congestion and they take advantage of its frame relay network here and in the US. Managing director Valerie Holt says this is particularly good for those contacting the US a lot. "This is not for playing games. It's a robust industrial-quality product," Holt said. Its attractions for the SoHo user include its price of £14.95 per month (ww.uk.psi.com).

Short Stories

Solomon gets wiser



■ Dr Solomon's Software has released version 2.5 of Audit, which keeps track of hardware and software on a network. It includes 32-bit scanners for tracking NT and Windows 95 installations. A five-PC starter pack costs £475.
www.natinst.com/uk/

■ UniDirect says its IPconnect package is the first to offer integrated internet access and email for Novell users. It gives a whole network internet access via a single modem, avoids the need for a dedicated internet server, and acts as an SMTP or POP3 mail server and firewall.
Unidirect 01788 552005

AA guide

■ The new MathLab 5.0 for Finance promises advanced computing and analysis tools for finance workstations.
AA 01634 297123

£1000 server

■ Elonex claims its £995 Kayak is the first preconfigured server to sell for under £1,000 (ex VAT). It uses a 166MHz Pentium-class processor, with 512Kb pipeline cache, 24Mb of RAM, an eight-speed CD, a 2.5Gb drive, a 14in monitor and a network adaptor.
Elonex 0181 452 4444

Free NT defragger

■ Executive Software has posted at www.execsoft.co.uk a free, non-expiring version of what it says is the only disk defragger for NT.
Executive Software 01342 327477

Web faxer

■ Message Management is showing at www.faxfromwed.co.uk its new system that lets people with slow modems have pages sent to a fax number.
Message Management
0181 960 2700

Thin drives move battle of the superfloppies onto notebooks

The battle of the superfloppies has shifted to notebooks, where special thin versions of 100Mb Zip and 120Mb LS120 drives are vying to replace the floppy.

The LS-120, sold by OR Technology as the a:drive, reads and writes standard floppies as well as its own 120Mb disks. The price to manufacturers is now below £100, but the added system cost is less than this because a floppy drive is not needed.

It has received huge backing from Mitsubishi and 3M spin-off, Imation, both of whom are manufacturing the disks. However, the write speed to standard floppies is relatively slow.

Iomega's Zip drive is faster but cannot read standard floppies. However, some vendors believe it has the edge because the desktop version is already established.

Siemens Nixdorf, which has launched a new entry-level model for its Scenic Mobile range (right), is testing both devices. Mobile

Siemens Nixdorf's new entry-level multimedia Scenic Mobile 300 has a modular design to ease upgrades — even of the processor. Prices start at £1,199 ex VAT

product manager, Stefan Reister, said no decision had been taken but he believed the Zip would prove more popular. "The Zip has sold millions. It is a de facto standard."

Both drives are bootable provided the host machine has a compliant BIOS.
OR 01491 413663 (Dealer: Ideal 0181 286 5000; Iomega 0800 973914

Clock this...

■ This image of a clock in Basle is one of 50 on a £8.50 CD called Beautiful Desktop. All come in nine different screen resolutions for use as wallpaper, but some images are more practicable for this purpose than others. Picking out your program icons from a high-definition picture of the Colosseum in Rome is likely to give you a headache, however magnificent the view.
Price Media 01635 862064

Texas, Olivetti sell off computer divisions

■ Two major manufacturers have offloaded their computer divisions in the past month. Troubled Olivetti sold its PC division to a new company called Piedmont, set up by the Centenary group led by London lawyer Edward Gottesman. The deal, worth about £100 million, will leave Olivetti with ten percent of the new company. Some analysts fear Piedmont is interested only in asset-stripping but Gottesman claimed the unit can be profitable.

Meanwhile, Texas Instruments sold its mobile division, which makes the TravelMate and Extensa series of notebooks, to Taiwan-based Acer, the fourth biggest PC manufacturer in the world.

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Short Stories

Showing off

■ DIP claims its Showman Pro notebook is the only one available with a built-in overhead projector tablet. There's a choice of 10.4in or 12.in TFT colour screens with 800 x 600 resolution, and an eight-speed CD drive is included as standard. Prices start at £2,300.
DIP 01442 874006

Hard facts

■ Jenson Tools is selling a CD version of the Microhouse Encyclopaedia of Hard Drives, which claims to have details of virtually every drive and controller made for the PC. It costs £195 (plus VAT)
Jensen Tools 01604 787060

Name offer

■ CIX is offering personalised email addresses for £30 a year, plus net access charges. They take the form yourname@yourcompany.cix.co.uk.
CIX 0845 355 5050

New Visual suite goes way past the Basics

Visual Basic 5.0, the biggest upgrade yet to Microsoft's best-selling programming environment, goes on sale this month. The price was due to be announced at launch day.

VB 5.0 will also be sold as part of Visual Studio 97, a new suite of integrated programming and internet tools — a kind of Microsoft Office for developers. It also includes the latest C++, J++, and FoxPro Visual environments, a library of documentation, and Visual InterDev, a new system for building database-driven web applications.

Bill Gates will launch the suite, and announce the price, at a training event for developers on 19th March.

Mike Pryke-Smith, net tools product manager at Microsoft UK, said the new suite would help companies build "communications links to business partners and customers" based on their existing IT infrastructure.

New features include native-code compilation, ActiveX controls and improved components: performance is up to twenty times faster than VB 4.0. Users who bought VB 4.0 after 27th January can upgrade free of charge.

■ Microsoft is holding £99 "DevDay" training events in Dublin, Edinburgh, London and Birmingham on 20th, 24th, 25th and 26th March respectively.
Bookings on 0990 228811

VB for Psion Workabouts

Developers can now use their Visual Basic skills to build specialist applications for Psion's Workabout range of industrial handhelds.

Psion is now selling Workabouts with its VB-compatible Oval development kit, which allows applications to be programmed on a PC to run on a handheld. Oval programs also run on Psion 3c organisers. VB code can be ported to Oval with the aid of conversion wizards.

Psion, facing its greatest ever competition from the new Windows CE handhelds, has formed a new industrial division to sell machines for specialist applications. Typical applications include data collection tasks.

Workabout prices start at £300. There is a variety of add-ons including a new Wanda barcode reader.
Psion 0171 262 5580

Top 10 Windows software

			Last month
1	Win95 U/G with Internet	Microsoft	4
2	MS Encarta 97 (CD)	Microsoft	1
3	MS Off/Pro 97 B/Shef + Mouse	Microsoft	56
4	MS Flight Sim 6.0 (95) CD	Microsoft	2
5	Master Clips 101,000 CD	IMSI	5
6	MS Word Bundle	Microsoft	3
7	PC-Cillin 95	R. Manhattan	12
8	First Aid Deluxe (95&3.1)	R. Manhattan	8
9	Cleansweep 97 v3	Quarterdeck	-
10	Norton A/Virus U/G Ins	Symantec	-

Top 10 CD-ROMs

1	Star Wars Trilogy	One Stop	n/a*
2	Beavis and Butthead Screensaver	Tring Int.	n/a
3	Babylon 5: Limited Edition	Screen Ent.	n/a
4	Star Trek Voyager	Screen Ent.	n/a
5	Empire Strikes Back	Screen Ent.	n/a
6	Encarta 97	Microsoft	n/a
7	Inside Independence Day	Electronic Arts	n/a
8	Cinemania 97	Microsoft	n/a
9	Music File	File Productions	n/a
10	Kais's Power Goo	Principle	n/a

Top 10 DOS software

1	System Commander	POW	1
2	Command & Conquer (Red Alert)	Virgin	3
3	MSDOS v6.22 Upgrade	Microsoft	6
4	Total Insanity CD	Europress	4
5	DOS 2 Win95 UG with Inter	Microsoft	10
6	Turbo C++ v3.0	Borland	9
7	MSDOS 6.22 MLP 1	Microsoft	61
8	MacroAssem 6.11 for Win	Microsoft	34
9	Quake Full Release v1 CD	GEM	7
10	Norton PC Anywhere v5 DOS	Symantec	23

Top 10 peripherals

1	PNP 16-bit PNP ASOUND	Enta	4
2	Inns 33600 Ext voice/fx/mo	USR	10
3	Primax 4.800 Direct	Primax	5
4	33.6 Int Fax/Modem no Voice	Tashika	-
5	33.6 Int Svoice 2.2	Tashika	-
6	Creative Phoneblaster	Creative	28
7	miro Connect 34	miro	8
8	33.6 Ext with Voice	Tashika	-
9	Evergreen 486/586 Proc UG	Mid	15
10	8x MultiMedia Kit	Tashika	-

Software and peripherals figures supplied by Software Warehouse. CD figures courtesy of HMV Games/Level One. *Information not available at press time.

Vive la multimedia

In France, where PC ownership and CD-ROM sales are increasing apace, the state is backing multimedia to ensure its success, reports Tim Nott.

The French take their culture almost as seriously as their food, so at Milia, last month's international festival of multimedia at Cannes, the Minister of Culture, Philippe Douste-Blazy, addressed press and participants because, in his own words, "it would be unthinkable not to". This is not just politico-speak. Although PC ownership in France is comparatively low, it increased by 150 percent last year and over 3.6 million CD-ROMs were sold. Of these, 15 percent were classed as "cultural" — three times the percentage for Germany. The government is determined to make multimedia a success: "It is imperative that both the wealth of our heritage and the talent of our creators should exploit these new electronic tools," said Douste-Blazy.

Since 1983 it has been compulsory for other media publishers, in addition to book publishers, to deposit copies of published works with the Bibliothèque Nationale (National Library). So there is now a comprehensive national archive of multimedia. In addition, there is the newly founded Médiathèque de l'Ircam which provides a unique collection of documents and media relating to 20th century music.

There is a drive to digitise the contents of galleries, libraries and museums throughout France, forging partnerships between state and independent publishers which has conceived titles such as Montparnasse's stunning virtual reality tour of the Quai d'Orsay gallery. The Bibliothèque Nationale is itself getting digitised, with the long-term aim of making it truly national, with on-line access from local libraries. By 1998, 100,000 texts, 300,000 images and 40,000 hours of sound recording will be available electronically. The Ministry of Culture has its own web site, scoring 5,000,000 hits per month.

The state is putting its money where its mouth is on a number of levels. First, training for budding creators (at the Ircam studio and throughout universities and art schools) will be counterpointed by training for end-users, with local libraries offering practical instruction for new readers of electronic publishing. Second, financial aid: through the Centre Nationale de Cinématographie, 60 projects have already benefited.

Aid is available in the form of loans for multimedia projects, to counteract the banks' reluctance to underwrite the new technology. Financial support is also being offered to exporters, with aid to help in the "localisation" and translation of works into other languages, and grants to attend international trade fairs. On a practical level there are state-funded organisations for authors to simplify the legal issues of publishing and protect their electronic rights, and the formerly cumbersome restrictions on where CD-ROMs could legally be sold has been lifted.

So, analysts who predict gloom for "serious" multimedia in the UK market, take note: it is not for lack of talent or cultural diversity that the UK is lagging. Multimedia is a seed technology, and, as with all seeds, it needs nurturing and watering. Above all, we need to accord it the respect and support it deserves. I will leave the last word to M. Douste-Blazy: "Like our cinema, our multimedia must be taken seriously. If we do not provide aid, then it will cease to exist." ■

Vive les Brits

British culture was not entirely neglected at Milia. Even though it took a US company, Seventh Level, to bring it to market, Monty Python and the Quest for the Holy Grail was joint winner in the games category. It tied with The Pink Panther's Passport to Peril (*pictured, right*), already awarded a five-star verdict in *PCW* (March). Boots the Chemist, and Uploaded (the on-line edition of *Loaded* magazine) were shortlisted for best web site but lost out to the Discovery Channel. In the edutainment category, the winner, Operation Teddy Bear, sounds encouragingly English but is, in fact, a French title. France also scooped the Reference section. But in the Recreation — How-To section, Anglo-French honour prevailed with the English-language CD-ROM magazine, Interactive Wave, from Editions Numeriques. The Art and Culture prize went to the beautiful National Museum of American Art. And the top prize? The Milia Gold? Step forward Peter Gabriel, whose Eve, a joint UK-US production, combines contemporary art, music and technology in an "exploration of the eternal riddle of the relationship between man, woman and nature".

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The big fight

It's TV and cable industries versus Microsoft and Intel. The battle for control of consumer access to digital content will be over by Christmas, says Tim Bajarin.

In 1984, when the PC was starting to gather steam, a major Japanese television maker asked me to view a product it had in its labs. As a PC analyst I could not imagine what it was, but I went out of curiosity. My host showed me what must have been the first-ever PC/TV combination. Here, in front of me, was a 21in TV that had in its base a modified 286 motherboard.

Turn it on and it will run: The Apricot MS530 Diamondtron 17 PC/TV system has everything a family could want and comes internet-ready [reviewed in *PCW*, May '96]

The company was very excited about this contraption and asked me what I thought they should do with it. At the time, I was working on a project for a cable TV company to define the role of cable and its potential impact in a business environment. I did not have a clue what the TV people should do with their PC/TV combo, but I suggested that the PC and the TV might converge in the future and that their chicken had been hatched too soon. As for the cable guys, our final report stated that unless cable could provide two-way access, the business community would have no use for their services. I was reminded of those early days as I walked around the Consumer Electronics Show (CES) and came across various PC/TV schemes, such as those from Web TV and Akai, as well as various cable modems and internet access schemes.

All the major TV and cable firms are now aggressively chasing business and consumer markets with products aimed at bringing consumers into the digital age. Interestingly, this move has become controversial as well as highly parochial. The TV and cable industries would love to control the way home users access digital "stuff". The problem is that integrating a PC forces them to deal with standards and protocols.

So it should come as no surprise that Intel and Microsoft have entered the fray. The day before CES opened, Microsoft officially announced its "reference" model for a PC/TV. Of course, it is based on the Intel processor and Windows 95. But, like Netscape and Sun, who would like the internet to be based on open platforms, the cable and consumer electronics industries do not want Microsoft and Intel dictating their future, and this is one area in which the two giants are not assured of a dominant role.

If the internet becomes the backbone for delivering two-way interactive entertainment, and Netscape and Sun Microsystems (along with the cable and consumer electronics companies) resist this advance from Microsoft and Intel, the hearts and minds of mass-market consumers will be up for grabs.

In fact, this will be at the heart of a major debate over the next 12 months as each faction tries to move in on the other's territory. Cable and electronics firms are reviewing the Microsoft reference design carefully, but not because they really want to adopt it. Content delivery will be a major part of their role but they will need programmers to make it more exciting and interactive. There is a multitude of x86 programmers who could help them achieve this, but Java is also a strong contender. If the internet is the only broadcasting backbone, Java could provide a powerful cross-platform programming language that makes a PC-based system an option, not the primary digital access device.

I am convinced that this is the year the issue will take prime debating space. The battle for control of how consumers gain access to digital content will be fought and clear winners will be declared by Christmas. If you were thinking of getting a DVD-ROM or DVD player soon, think again: the lack of secure copyright protection is stalling the rollout of these next-generation devices. DVD, digital VHS and digital video recorders are all affected. Without a secure transport scheme embedded in all of them, movie and music companies have been reticent to put any of their content into digital form and make them available for these digital platforms. All parties have agreed on a method of software encryption but the movie and music industries want protection extended to the data paths inside the PC or other DVD devices.

One suggestion is to incorporate encryption into the IEEE-1394 specification for fast serial links (or what Apple calls Firewire). Most PCs will be 1394-enabled by next year, anyway. But these secure transport specifications will take time to finalise, making it unlikely that DVD will make any impact in 1997. ■

Banking on it

Within three years, most European banks could be providing a full internet banking service. Some are almost ready to go. Ben Tisdall gives an account.

Everyone likes the idea of online banking: the banks because it costs so little, and the customers because they can do it from the comfort of their home or office. A recent survey by Booz Allen and Hamilton estimates that 80 percent of European banks will provide a full banking service on the internet within three years. Another, by ICL/Mori, now expects that 17 percent of people will use PC banking within five years (up from 13 percent the previous year).

The Royal Bank of Scotland's announcement that it will offer internet banking to all its customers by spring has stolen a march on its rivals. While other banks try out proprietary systems, Royal Bank will offer a range of transactions across the net. Customers will be able to review their account details, direct debits and standing orders, pay bills to any of 750 major companies and export account data to a spreadsheet or personal finance package. The service will be free for the first six months, with a fairly nominal monthly fee thereafter.

One of the barriers to net banking has been security. But Royal Bank is so confident that it has solved the problem, it is offering its internet customers a refund of unauthorised transactions provided they have kept their security and PC registration codes secret. But the bank's early move to net banking has tied it to an Internet Explorer-only solution. It says that only Microsoft could supply the 168-bit encryption it needed in the time available. Royal Bank's initiative has left rivals floundering.

Barclays PC banking service, announced last October, is completely proprietary. Users have a customised version of Microsoft Money to dial up Barclays own servers. Bizarrely, Barclays claims this approach will make the service more widely available to those who have a PC and a modem but no internet access. What it is perhaps forgetting is that as corporates hook up to the net with fast leased lines, it will be simple for office workers to log on in their lunch hour and sort out their banking requirements.

NatWest's approach falls somewhere between the two. Its pilot scheme, now with 1,500 personal and 500 small-business customers, opted for internet-compatible software. But the software, Netscape's browser, is a customised version designed to dial in to NatWest servers. TSB's scheme is different again. It offers a service that's available only to CompuServe customers.

So far, the online banking services on offer are limited to viewing and planning finances. The next stage will involve smartcards. Compaq is predicting that within 18 months every home PC sold will be fitted with one. Acorn, which plans to launch its TV set-top box, the NetStation, in May, will ship it with a smartcard. NatWest has already trialled its Mondex system in Swindon while rival, Visa Cash, is on trial in several countries. In Atlanta, in the USA, 1.7 million Visa Cash cards have already been issued. Two types of card will be available: disposable (like a phonecard) and reloadable. This is how it works: you connect an inexpensive smartcard reader to a PC and then charge the card by downloading electronic cash. It acts like an electronic purse and can be used both in real shops and virtual shops on the net.

The ubiquitous queue at the bank could soon become a thing of the past with the onset of full on-line banking services and the "electronic purse"

Visa's research shows that less than 0.2 percent of transactions under $10 are made using a conventional credit card. Smartcards will enable cheaper, faster, transactions and will make it practical to charge a few pence for accessing a web site.

In the long term, everyone expects the banks to move to internet-only solutions; the simple reason is that it's cheaper than developing and maintaining proprietary client software. After that it's "Bye, bye, ATMs" according to James Lockheed, the MD of NXYS which designed the interface for the Royal Bank service. What banks want is a single interface for all banking services. You'll use that interface whether you're visiting a web-enabled kiosk at a high street bank, or surfing your bank account from your desk or from a web-enabled TV at home. You'll even use it if you're walking down the street and you're not carrying cash, just a couple of smartcards. ■

Sounding Off

Colour scanners today are not so innovative, points out Michael Hewitt, they're just more accessible. They could never compete with a good gang-scan.

Michael Hewitt

The shops in uptown Penzance remind me of those I visited in Moscow's GUM department store during the butt-end of the Communist era. Essential items are there, but your chances of finding anything up-market or unusual are as close to nil as it's possible to get without playing for Scunthorpe United. So on those odd occasions when something vaguely exotic does turn up, everybody's natural instinct is to snap it up on sight. Not because they need it or want it, but just to stop anyone else getting it first. So when I discovered that the Penzance branch of Dixons had managed to get hold of a sheet-fed colour scanner, out popped my Visa card. Called a Primax PagePartner, it's one of those hi-tech miracles that, according to the blurb on the back of the box, transcends the functionality of a mere scanner and becomes instead a "solution", or to be more specific, a "complete input device and peripheral sharing solution" — i.e. it plugs into the PC's parallel port, while the printer plugs into the back of the scanner. Once I'd stuck in all the bits and installed the software, I availed myself of my ergonomically designed complete water-heating and throughput-enabling solution to make a cup of coffee. Then it was play time, using some pages torn from Arena.

I'd forgotten how massive an A4 colour picture can become when scanned at 300dpi. Even some inconsequential little git like Noel Gallagher amounted to 24Mb. When that girl from the Wonderbra advert joined him, the PC began begging for mercy. Finally, it gave up the struggle and declared that it had performed an "illegal operation". Then it rolled over and died. Most irritating. So I applied mouth-to-mouth and re-started, this time with my snapshot collection, at a more modest 150dpi.

Using Corel PhotoPaint, which came with the scanner, I fed stuff in and got creative. I turned people's coats from green to red, "colorised" black-and-white photographs, sharpened-up out-of-focus shots, rotated images through 180 degrees, stuck one person's head on another's shoulders and generally wasted the afternoon in a very pleasant manner. Every so often I'd get another memory allocation error or pacemaker failure, but what the hell? With today's software and hardware, it's par for the course.

Don't imagine the above is in any way innovative. No, indeed. Just as every generation believes that it discovered sex, so every new incarnation of the Pentium chip thinks it invented graphics handling. In fact, people were doing this sort of thing when many of the current *PCW* editorial staff were just knee-high to a workstation. At least ten years ago, there were systems around that could scan and process such high-quality colour images as I've described. Furthermore, they were more powerful than today's PC-based "solutions". And, more importantly, they were more reliable.

The big names back in the mid-eighties were companies like Quantel, Crosfield, Itek and Scitex. Their systems could "gang-scan" dozens of photographs or transparencies in one go and feed the data, in multi-gigabyte lumps, to an adjoining workstation over a fibre-optic link. There, you could manipulate the picture in any way you wanted. If you wanted to flip it through 180 degrees, it flipped almost instantaneously. If you wanted to give Margaret Thatcher a punk hairstyle you just clicked on a box and she got an instant mohican. There was none of this hour-glass and "Please wait…" nonsense. And this was happening in the days when a 286 was regarded as a fast computer.

The reason for the hyperactivity was simple: these were all dedicated systems. The functionality was hard-coded into the chips, each of which performed just one operation. Without the drawback of a buggy operating system to hold them back, they were supersonic. But you couldn't just wander down the high street and pick up, say, a discounted Crosfield 9500 workstation for cash. A scanner and workstation setup took a large chunk out of £1m, so they didn't make much impact on the home or SoHo markets. Only the likes of Robert Maxwell and Rupert Murdoch could afford the things. But this in itself was an advantage. Today, if my graphics software suffers an embolism, mid-operation, I've got just two options; Ignore or Close. But Maxwell and Murdoch could click on a third — Sue. If the graphics system responsible for, say, the Sunday Mirror magazine decided to barf before press day, that would have been it. No magazine, no advertisement revenue, nothing. So the companies supplying the kit made sure their systems were ultra-reliable before they left the premises. They didn't use the customers as unofficial beta testers. If problems did occur, they didn't keep Captain Bob on hold and suggest he re-install the software or download an upgrade patch (not if they wanted their company to stay solvent, anyway); within the hour, a technician would visit.

So bear that in mind. With today's technology, we're not necessarily making progress. Just catching up.

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Homefront

Tim Nott CIX over the traces, having encountered a bundle of trouble with email. And next, ladies and gentlemen, the winner of the @ thing competition.

Tim Nott

As those who read all the way to the back of *PCW* may have noticed, I fancy myself as a bit of a whizz with all this technical stuff. I can read words like "parameters" and "configuration" without breaking into a cold sweat and, unlike some columnists, I know the value of pi. Consequently, I've always felt smugly confident of being able to cope with any little problems my PC, and the electronic world at large, care to throw at me. This week, though, this hubris was abruptly punished by Nemesis.

I've been using electronic mail for six years now, through the CIX conferencing system. I can compose email messages offline using Ameol, and these go straight to a fellow CIXen's mailbox or are forwarded to other internet addresses. That's letters, if you maintain the mail paradigm, but parcels are different. If I want to send something other than a plain text message (usually a ZIP file containing documents and graphics for a feature) then it goes by binary mail. In this case, the files go straight to the recipient's private directory at CIX, and a note appears in their mailbox stating that the parcel awaits downloading.

Parcels outside CIX are delivered in a different way. Ameol converts the files to 7-bit uuencoded format and breaks it into 64-bit chunks. These can be transmitted across the internet like ordinary messages and the recipient can re-assemble the thing and decode it. In theory. Even when it does work, it's a pain in the neck. But since practically every UK computer magazine has a CIX account, the problem doesn't arise.

This week, however, I had to deliver copy and pictures elsewhere. Back came the message that the uuencode wouldn't decode. Could I please resend, not using uuencoding? Since the latter was the only option using Ameol/CIX, I sent it all as MIME attachments via my local ISP, France Telecom's Wannadoo. Okay, piece of cake; write a covering message, attach the file and press send. Off it all went… to my Outbasket, where it stayed like a great, constipated lump.

The next few hours were unpleasant in the extreme, and having exhausted the B- C- D- and F-words I got dangerously near the end of the alphabet. First, Exchange fed Wannadoo the logon password instead of the mailbox password. Having sorted that, there followed a merry dance with me clicking everything in sight and nothing occurring except my phone bill. I then tried things from the Wannadoo end, which rather unhelpfully launched Ameol again. I had an extended conversation with the little Office paperclip, who introduced me to a selection of fascinating but totally irrelevant topics, then gave up. Finally, by a combination of techniques I would rather not divulge, I got Wannadoo and Exchange connected. And zoom! My Exchange Inbox instantly filled with my Wanadoo mail. All of which I'd already read, but let's not be churlish. Thud! My outgoing message stayed exactly where it was and nothing would shift it. By now, the little paperclip was in tears, so I logged off and closed down Exchange: "There is unsent mail, do you really want to quit?" Pausing only to scream, I dragged and dropped the files onto a floppy disk. I dragged the disk out of the machine, out of the house and down to the Post Office where I embedded it in a suitable "container" and attached a Sticky Tariff-Aware Mailing Protocol, or "STAMP" as postal techies would say. All that remained was to stop dragging and drop it in the box. Sometimes, the old ways are best.

"Off it all went … to my Outbasket, where it stayed like a great, constipated, lump"

Where it's @

Thank you, all who came up with names for the @ thing, as used in email addresses. We were looking for originality and wit but also the serious requirement that it should pass the "telephone test", i.e. not sound like anything that could be confused with part of a host or domain name when spoken over the phone.

This is where many fell down: suggestions such as *a-circle* and *a-round*, although eminently sensible, use words too ordinary to pass the test, and Ray Templeton's ingenious *atpersat* just doubles the confusion. Honourable mentions must go to *doofer* from Thomas Hodgson, Romanou Macauley's *a-nut*, Stuart Thompson's *tadpole* and Dan Ferris' *That damned "a" sign*. The two runners-up, who each get a £15 book or record token, are Sophie Dixon for her unambiguous and delightfully silly *belly button* and David White for *ampersnot*, because it's NOT an ampersand. The outright winners, of a £25 token, are Carole and Stephen Cotterell for the unmistakable and apposite *e-snail*.

■ timn@cix.co.uk

Straight Talking

And it came to pass that the MMX chip laid waste the Pentium PC… Barry Fox did warn you. Now take heed: bide your time before buying that 56K modem.

Barry Fox

Consumers expect their VCR or TV to last ten years, yet are resigned to a PC's working life of only about 18 months. After that it is obsolete, as it doesn't have the wherewithal to run the latest software. I spent the pre-Christmas period advising anyone who would listen not to buy a Pentium PC until the MMX chip was launched. We knew it was coming but Intel would only hint at the first quarter of the year. So when Intel officially unveiled MMX just one week into the new year and manufacturers had MMX hardware and software available for sale the same day, the company redefined the boundaries of commercial cheek and contempt for consumers. Those who had bought a Pentium PC for Christmas saw its built-in obsolescence pared down to just 18 days. A PC bought the day ***before*** the MMX went on sale, was obsolete within ***18 hours***.

At the launch, Intel boasted that the company had been working with 100 software developers for 18 months: so, there will soon be a flood of software that will only run on an MMX. But somehow, Intel had not had the time to finalise plans for an overdrive chip that would have breathed MMX life into an existing Pentium. There was no date, no price and no information about which motherboards could be upgraded. Admitting the high cost of a new MMX chip to replace a near-new Pentium chip that has no re-sale or trade-in value, would have embarrassed even the armadillo-skinned Intel.

These days, I am telling anyone who will listen that they should hold fire on modem purchase and certainly shelve plans to install an ISDN line until the dust settles on 56K analogue modems. ISDN lines provide a basic 64Kbit/sec pipe into the internet but BT charges £400 to install the line and over £100 rental per quarter (or various confusing variations on the same outrageous theme). An ISDN Terminal Adapter, which is needed to connect the PC to the digital line, costs several hundred pounds. And the net can still be treacly if the remote server or its route connections are clogged by traffic. The 64K connection only really comes into its own when uploading and downloading large files by direct connection, or on an email or closed user group.

There is little point in paying for an ISDN internet connection. But if a £200 modem could run at similar speeds on an ordinary analogue line, it would be worth using. Such modems do now exist and will shortly go on sale. They achieve what should be the impossible by taking advantage of recent developments in the way Internet Service Providers and data sources connect their servers to the national and international phone networks.

The phone company uses PCM coders to sample analogue speech at 8kHz and code it into 8-bit words. This gives only 256 sample levels. It roughens the sound by adding quantisation noise, which puts a ceiling of around 35Kbps on today's modems. If service providers connect their digital servers direct to digital phone lines, the data which streams down the line to a user's modem never passes through an analogue-to-digital PCM converter. It only passes through a ***digital-to-analogue*** converter before reaching the subscriber. This conversion uses only the 256 accurate levels of the PCM code and so introduces no quantisation error. Although the theoretical data speed should now be 64Kbps (8kHz x eight bits), system noise and equalisers in the phone network reduce practical working to 56K. The reverse route upstream from the subscriber's modem into the network must, however, pass through an analogue-to-digital converter as the line from the subscriber's home is analogue and the network is digital. So the upstream route suffers quantisation noise which limits data speeds.

With big market rewards at stake it was inevitable that companies would develop proprietary implementations of the 56K idea. Lucent Technologies conceived V.flex2 while Rockwell worked on the similar K56Plus system. Last November, the two companies agreed to pool resources and promote a single system, K56Flex.

US Robotics (USR) developed a different system, X2. The difference is that USR provides a return path of 33.6Kbps, whereas K56Flex claims 45Kbps. The faster return path from K56Flex is desirable because it brings analogue data rates closer to ISDN. But 33.6Kbps is more robust. The International Telecommunications Union (ITU) is trying to set a single standard for 56K working but the industry isn't waiting. USR is making a pre-emptive strike with Sportsters which have flash memory to download the X2 code when it is ready, and claims support from ISPs. But support talk is only meaningful when a large proportion of an ISP's servers are up and running at 56K. With the industry's track record of disregard for the customer, I would want a written assurance that any 56K modem bought now will be upgradeable to whatever standard the ITU finally agrees. Without that, it's safer to wait a while.

■ Barry Fox is at 100131.201@CompuServe.COM

Business Matters

What's the best way to purchase a PC in the shopping jungle — mail order, the high street, or a superstore? There's good and bad in all of them, says Brian Clegg.

Brian Clegg

When a large company buys PCs and software, it usually either contacts a manufacturer directly or goes to a specialist dealer who will provide staff full-time in order to handle the company's every need. When a small business goes IT shopping, it's a different matter. The kind of service provided will be on a different scale. So how best to proceed in the purchasing jungle?

The cheapest approach will generally be mail order, but purchase price isn't the only important factor. Support could well be an issue, and there's a limit to what can be done down a telephone line. Against that you need to set the extra cost of shopping in the high street and some assessment of chance that the local retailer will deliver on its support promises.

Large mail-order companies like Dell have built a reputation on good customer service (even if there's been some grumbling in the press lately), usually providing lifetime phone support and everything up to on-site next-day maintenance. A box-shifting outfit looking to provide the tightest deal on memory or software is unlikely to have the same level of support, but can be extremely competitive.

There's a range of options available on the high street too, from Dixons to the small computer shop. However, the most likely place to walk into these days is PC World or one of its competitors. The PC superstores accept that they can't match mail-order firms on price, but claim instead to provide better support when buying, better assistance after the sale and general handholding.

Perhaps surprisingly, when buying what is typically the most expensive purchase, the PC itself, mail order has a lot going for it. PCs usually come preconfigured and setting them up is a simple exercise. You have to be careful how you make the purchase: like many others, I have been caught out in the past when a PC firm went bust between accepting my order and delivering the goods. Because I had placed the order with a credit card, my Visa company refunded the loss. Otherwise I would have been left scrabbling for cash with the other debtors.

Of course, an absolute beginner may be unhappy with a box dumped on the doorstep, but however effective the assistance from a superstore, it is not going to turn you into a confident user. A short course or a few evenings with an expert friend are more likely to help. Software, similarly, is a straightforward purchase. Choose the package you'd like with the help of a suitable magazine, and order it. Installation is rarely a problem these days. There's little reason for bearing the cost of the high street.

It's the middle-ground, secondary hardware like a printer or a new hard disk that demands more support. In the first place, you need to get the equipment in place. If you don't feel confident about opening up your PC, most superstores offer an installation service. There might be some doubt about compatibility — again, avoid mail order. PCMCIA cards, for example, are notoriously fussy, running in some machines and not others. When I recently bought a CD-ROM for my laptop I noted the stern warnings in the mail-order listings that they did not send products out on trial. When I pointed out the possible incompatibility at PC World, the salesman had to check whether I could return the item, but agreed that I could.

With other kinds of purchase, it's not always obvious whether the superstore or the mail-order merchant will provide the best assistance. I recently enquired at a superstore about the cost of ink cartridges for a printer it was selling. Despite the salesman's enthusiastic attempts, he couldn't find them in the store and had no means of looking up the price on computer.

Again, when I asked about an external hard drive, a different salesman searched for a while, decided they had been moved and couldn't tell me which products they stocked. Mail-order firms answered these questions immediately. A few weeks beforehand I had wanted to buy an internal tape drive. I had read of problems obtaining suitable drive rails to mount the drives. The mail-order firm couldn't help at all. PC World staff thought I didn't need drive rails, but if I did, they had a handful of them labelled for a different manufacturer's machine which they thought might work. In the end, with a little ingenuity, I got the drive in without rails, which was probably just as well.

You pays your money and you takes your choice. Where you need help with installation or there is some doubt about compatibility, the superstore is attractive. In other circumstances, it's a bit like taking out an extended warranty. It may give you peace of mind, but many of us would prefer to underwrite our own risk and save the money.

■ BrianClegg@msn.com

Letters

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Refreshing change
I note that in the Table of Features section of the MMX group test in the March issue of *PCW,* the Iiyama Pro 9017E monitor is quoted as having a maximum refresh rate of 75Hz at 1024 x 768. I use one of these monitors with a Matrox Millennium card with a refresh rate of 85Hz at 1152 x 864 in 24-bit colour. At least, that's what is reported by both the monitor and the Windows 95 software.
Ian Ford
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No more Mr Nice Guy
The baby's head/fork incident: I thought it was quite tasteless, offensive and utterly vulgar. But then again, so am I, so I found it rather amusing. Don't let the Goody-Two-Shoes Brigade get you down!
Malc Smith
malcolmsmith@compuserve.com

Here's to you, Mrs Robinson
In your *Letters* page in the March issue, there were some comments about the ChipChat thing that involved a fork being stuck into a baby's head. Most correspondents said they thought it was in bad taste, but these people should have taken it for what it was — a joke.

Obviously these people have nothing better to do than sit around and moan about things that don't have any significance. They're all probably boardroom bigwigs with nothing better to do. You know the type, Anne Robinson's fave people.
Lindsay Taylor
106414.370@compuserve.com

Modulation matters
In his "Rant corner — baud and bps" *(PCW March, p304)* Roger Gann describes as embarrassing "the number of otherwise knowledgeable people who use the terms baud rate and bits per second interchangeably". It's also embarrassing to complain about other people's gaffs while committing your own.

Modulation does not mean "to encode digital data into analogue waveforms", as Gann writes. That process has been given the quite transparent name of "digital-to-analogue conversion". Modulation is a technique in which data signals are used to modify the amplitude, frequency, or phase of a carrier wave by means of modems (modulator/demodulators). The carrier wave chosen is of a suitable frequency for transmitting over the specified channel.

The last time I brought this common error to your attention, the columnist attempted to excuse himself with the claim that making technology intelligible to the masses calls for a degree of simplification. If that were true, your magazine would be able to explain the recent increase in maximum transmission rate over the public telephone network from 33.6Kbps to 56Kbps. This has not been satisfactorily explained in the several articles which have attempted to address the issue. The reason is clear: nobody at *PCW* understands it.
Gabriel Egan
exs01gie@gold.ac.uk

Lost in time
Your MMX news story *(Newsprint, March 1997)* states: "Intel's Multimedia enhanced MMX chips were launched to a resentful world last month". Now that would be February, but I am writing in January. Must this pretence continue month after month? It's not as if you take ages to get into print. See page 34: "So January sales have been more successful than the pre-Christmas run-up, but it lasted for two weeks of January only", and I am writing this only two weeks later.
Jim Mann Taylor
Phlomis@aol.com

Don't believe the MMX hype
I'm amused that Adam Evans has been taken in by Intel's hype about the MMX processor *("New technology: All about MMX", PCW March, p178).*

He says that "MMX is the most significant change to the basic architecture of the PC processor for ten years". Hogwash! The improvements are hardly as significant as the change from 8086 to 286 (protected mode, 16Mb memory), 286 to 386 (32-bit access, 4Gb memory, virtual 86 mode, on-board MMU) or 486 to Pentium (64-bit data, on-board cache, pipelining, instruction pairing). The MMX Pentiums have a bigger on-board cache, one extra stage in the pipeline and better branch prediction. This accounts for the 10-20 percent improvement in performance, but is hardly radical.

MMX also adds some new instructions that operate on sets of eight bytes, four words, two double-words or one quad-word at a time. They're orientated towards signal processing, and re-use the FPU registers to provide instruction control and repetition.

Working like this is called Single Instruction, Multiple Data. SIMD is not a separate "new process" (as shown in the article) but just a description of how the new instructions work. It's been around on chips costing tens of dollars (not hundreds) for years now.

A DSP chip (or a good DSP/CPU hybrid) can work with more than eight bytes at once. This is the technology in modern graphics accelerators, sound cards and modems. It's why you can buy a 3D graphics card, video RAM and all, for less than the price of a Pentium chip.

A 200MHz MMX Pentium is unlikely to be able to simultaneously act as a 33.6Kbps modem, wavetable sound card and 3D graphics accelerator — and also run the operating system and application. Multi-player games and interactive 3D web sites are just two applications I can think of that require this.

Yes, MMX means these cards can be made more cheaply, but only at the expense of eating into that prized processing power you spent all that money on buying a Pentium for in the first place.

MMX is a good idea for graphics applications like CorelDraw, Photoshop and Video for Windows, and it's good that the chips are backwards compatible with Pentium motherboards. But don't fall for the hype: it doesn't turn the Pentium into a DSP and it won't replace real multimedia hardware.
Sam Edge
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Crash and blow dry
I bought a Packard Bell from PC World at the end of November. When you spend £2,000 on a computer, you expect it to work for more than a few weeks. Considering I've been out of the country for four of those weeks since my purchase, it was only up and running for a short time.

Well... My HDD broke last weekend. An engineer came round and told me I had lost everything. I'm a writer, and not being the most diligent person in the world at backing up, I was distraught.

The engineer didn't have the right replacement so he went toddling off. The next day a friend of mine who "fixes" computers came round for a look. He also told me that I had lost everything. After a couple of glasses of wine I said: "Please, just have one more go." He did. When I said it sounded like the drive was cold, he jokingly said: "Get your hairdryer." I did. We warmed the poor little thing up and hey presto! It began working, long enough to retrieve everything. Modern technology, who needs it? Sell me a hairdryer instead, any time.
Bethan Davies
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Compatibility blues
My daughter recently purchased a Lexmark 1020 colour printer and I purchased some Express Software educational CD-ROMs, both from well-known high-street stores. The advertising both in national newspapers and in the store gave no indication that both would not run on the family 386 PC. In fact, the CD-ROM box stated that they would run under Windows on a 386.

The printer was a joy to install and was operating from Windows in minutes, but the CDs were not so good. Our PC with Windows 3.1 was not capable of running the CD programs and careful reading of the leaflet packed inside the box stated: "Make sure the computer is running DOS either from Windows or a C> prompt". So the CDs are fine direct from DOS until we want to print from them. You then find that the printer has no DOS driver so can only print from Windows.

Thus you are up against the classic non-compatibility problem: both are okay on their own but they cannot talk to one another. Having spent most of my working life struggling with this problem, the first recourse is to helplines. Unlike the major manufacturers, the PC lines have only two states: engaged, or not replying with occasional lapses into answering. Such slots finally managed to elucidate the reply: "Tough luck, not our problem".

I am writing to ventilate a problem I know from professional consultations is common in the domestic PC market, and to ask if there is any way to make suppliers clearly mark their products with its performance, like "Best run under DOS" or "Only works from Windows", allowing purchasers to know what they are buying. Perhaps you could run an "honest supplier" index?
David Green
Bedford

The numbers game
The article on paying by credit card over the internet *(Straight Talking, PCW March)* was interesting in that no amount of encryption would have solved any of the problems outlined by Barry Fox. Once a firm has your number, they can charge twice or thrice, as Barry says, and just apologise for an "administrative error" to customers who detect that this has happened.

One solution would be for banks to issue sets of numbers to their customers, each of which would be used once only, like cheques. When ordering goods from a firm, the purchaser would give them a number and notify the bank electronically at the same time that this number had been issued to Firm X for an amount not exceeding, say, £100. Firm

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X would not be able to claim the payment unless they quoted the same number to the bank through the clearing system, and since it would only be valid for one transaction it would be of no value to hackers either.

This would not solve Customs problems, though. I ordered two boxes of cards from the Metropolitan Museum of Modern Art in Boston, USA, via CompuServe. Customs and Excise intercepted the package and charged me £7.50 for having done so.

Dr R D Turner
North Yorkshire

TV times

I'm a confused computer user; but then, aren't we all? The coverage of computing by the media is really getting me down. By and large, the quality of the written word in computer magazines is pretty good, the only problem being that they all seem to be testing the same item of kit at the same time. One does an article comparing monitors, they all do an article comparing monitors.

The news media normally gets things wrong and, of course, tries to make things as dramatic as possible. For instance, that all our computers are going to fall over on 1st January 2000 and we're all dumping our 200MHz Pentiums just because they don't have MMX. The coverage that really gets me down is that given by television, both terrestrial and satellite. The BBC gives us The Net, which is on late at night and normally has a very short run, and British Sky Broadcasting gives us The Computer Channel for two hours a day. Do computer users have amazingly short memories? The Computer Channel seems to think so, as it repeats the same items over and over again. During its first few weeks it even repeated items in the second half of the programme which it had already shown in the first! It also seems to assume that all computer users are complete morons. I know that new users have to be catered for, but you really can take this too far. And they have.

The site from NBC, also on satellite, was quite good when it started, but unfortunately they too seem to have run out of ideas and have gone the way of The Computer Channel, repeats now being the order of the day. NBC also gives us a couple of hours during the weekend, but again most of the output has been seen before.

So are we ever going to get an up-to-date programme with news, reviews and decent information, or are we expected to put up with the rubbish we are getting now? I live in hope.

John Godfrey-Parkins
Somerset

We look forward to the day when "The PCW Channel" is launched. With the coming digital TV revolution, it may yet happen!

Still in touch with touchpads

We are all familiar with the mouse and trackball, but whatever happened to the touchpad? Some time ago I came across one of these gadgets attatched to a desktop computer and, having had the opportunity to try it out, it immediately became a "must have". I searched the pages of *PCW* but couldn't find any mention of this nifty gadget. I eventually located one, an Alps Glidepoint, under the counter of a shop in Tottenham Court Road. Although quite expensive, relative to the mouse it replaced, it took up much less space on the desktop (about three inches square). It has three programmable buttons, the left-hand one rarely being used because a quick double-tap of the screen does the same job. With only a small movement of the forefinger, the cursor moves swiftly and precisely around the screen.

When I upgraded my computer, I needed to change the pad from PS/2 type to serial. Having tried unsuccessfully to obtain an adapter, I wrote to the manufacturer in America for advice. They replied by sending me a complete upgraded unit with their compliments. What British supplier would give service like that?

With mice and trackballs approaching the price level of the touchpad, why aren't these delightful little devices more available over here? Thousands of people don't know what they're missing.

P Gabbitas
East Sussex

Help! I'm dealing with Microsoft

Is Microsoft getting too big for its boots (and the customer's pocket)? I had a problem connecting with MSN (sounds familiar?). I called the helpline, who said that it was Win95 related and I would have to call 01734 271000.

Upon doing this, I was promptly advised that since I was out of my 90-day free support period, help could only be obtained to the tune of £30 per problem plus VAT. Having paid a whole year's subs to MSN, I protested that any savings thus made would be wiped out by such a charge. "Sympathy" was expressed, but I was told that this was company policy and was referred back to MSN on the grounds that they should be able to solve the problem anyway. MSN referred me back to Microsoft, saying that my

p59

particular problem did not fall within their brief. Resigning myself to what seemed the inevitable, I rang Microsoft back (this was on Friday night, 1700 hours) to be told that they were now closed, and this meant I had no chance of correcting the problem until the following Monday during working hours, the time when it is most difficult for me to make contact as I am teaching.

CompuServe and other service providers would presumably have attempted to correct the problem, not having other departments to fob their problems onto. Am I therefore better off using the latter in the future, or would they also be in difficulties if the problems were Win95 related? I tried complaining to Microsoft Feedback but received no reply.

Trevor Jones
THJones@msn.com

What millennium disaster?

In view of the concern over the coming millennium problem, I have carried out a number of tests and have found that all my older computers will handle dates into the millennium.

I have set my computer dates to 31/12/1999, let them roll over to 01/01/2000, turned them off and on again, and lo and behold, the system registers a date from back in the eighties. However, if I set the date of the system to 01/01/2000 and turn off the system, the millennium date is retained.

I have carried out tests using a number of millennium dates (up to 30 years into the millennium). The system represents the correct day of the week to correspond with the date, and recognises leap years, too.

In view of these tests, will my systems handle the millennium or have I missed something? If my findings are correct, why all the hype about computer disaster in the millennium?

Karen Smith
fh51@dial.pipex.com

More on file sizes

I read with interest the debate in your Letters pages concerning file sizes and I have something to add to this.

I carried out the following steps in Microsoft Word 7, saved the file after each process and found the file size:

- I created a blank document (11Kb);
- typed in "Hello World" (11Kb);
- inserted a 100Kb .bmp image (140Kb);
- removed the image (146Kb);
- deleted the text, leaving a blank document (146Kb); and
- saved this file as a different name (11Kb).

Please draw your own conclusions from this.

Nick Venn
Nick@vennp.demon.co.uk

Rough and ready

I was surprised that in Dylan Armbrust's review of the Panasonic CF-25 *(PCW February)* he mentioned how easily a laptop broke when you dropped or banged it.

I had a colour DX2/50 laptop and accidentally dropped it down a flight of stone stairs in my college. It fell on its side, its front, down about 25 stone stairs, and guess what? It was perfectly all right, apart from a few keys that had come out. It booted up first time!

This is not the first time my laptop has been subjected to bad treatment. I have accidentally dropped earth all over the keyboard and after a bit of shaking it was fine.

Why spend an extra £1,000 on something a bit more durable, when you could buy insurance for a fraction of that price?

Ben Way
CompuServe 71333,2330 ■

PCW Awards 1997

Your chance to vote in the seventh annual Personal Computer World Awards and win a super Sony Mini Hi-Fi and £100 of Virgin vouchers in the PCW Reader Awards.

The Sony system features CD player, dual tape decks, FM tuner, 30W super-woofer and full remote control. One lucky person will win this fantastic prize when the draw is made from all entries received by 25th April 1997. Fifteen runners-up will receive £50 Virgin vouchers.

The Personal Computer World Awards are about rewarding excellence and attention to service. The categories this year cover the industry like never before, with new awards for Hardware, Software and an extended list of Online Awards, reflecting the growing importance of the internet in business and home computing.

And your votes really count. We want to know which companies out there are supplying you with the type of service you'd want to recommend to someone else. We have split the Reader Awards into nine categories, in an attempt to cover the areas of service and reliability that affect you. The Reader Awards are decided solely by you, and are highly valued by the companies advertising in the pages of Personal Computer World.

In the other categories, your nominations are discussed by an expert panel of judges *(see left)* to produce a winner and two runners-up.

To make sure you are in with a chance of winning, fill in the categories on the form facing this page, tear it out, fold along the dotted lines and pop it in the postbox. We'll even pay the postage!

PCW Judging panel

Ben Tisdall Group Editor
PJ Fisher Managing Editor
Clive Akass News Editor
Gordon Laing Features Editor
Eleanor Turton-Hill Technical Editor
Adele Dyer Reviews Editor
Simon Rockman Associate Editor
Dylan Armbrust Senior Staff Writer
Adam Evans Staff Writer
Lynley Oram Staff Writer

PCW Technical Writers
Mark Baynes
Terence Green
Tim Nott
Tim Anderson
Paul Begg
Mark Whitehorn
Roger Gann
Nigel Whitfield

VNU European Labs Judging Panel
Wisse Hettinga European Labs Manager
George MacDonald Labs Manager
Jonathan Ricks Labs Testing Editor

Vote on the Web

This year for the first time you can vote via the internet. Just go to www.pcw.vnu.co.uk and follow the link to the online voting form.

The publisher of *Personal Computer World*, VNU Business Publications, will donate 20p to Oxfam's International Appeal Fund for every entry sent in. So, the more of you that enter, the more money VNU will be able to give to Oxfam.

Awards categories

Fill in as many categories as you want, complete your personal details, fold the form and post it to us (or fax it to 0171 316 9313).

Reader Awards

1	Best high-street retailer
2	Best software dealer
3	Best hardware dealer
4	Best PC supplier (mail order)
5	Best hardware telephone support
6	Best software telephone support
7	Best on-site maintenance
8	Most reliable PC
9	Best advertisement

Hardware awards

10	Most innovative hardware
11	Best PC system for business
12	Best PC for the home
13	Best notebook
14	Best laser
15	Best budget laser — under £350
16	Best inkjet
17	Best budget inkjet — under £300
18	Best modem
19	Best graphics card
20	Best gadget
21	Best handheld/palmtop

Software awards

22	Most innovative software
23	Best software suite
24	Best software application (excluding suites)
25	Best creative software
26	Best internet browser
27	Best utility
28	Best CD-ROM reference title
29	Best CD-ROM kids title
30	Best game

Online awards

31	Best Internet Service Provider (ISP)
32	Best content provider (not including ISPs)
33	Best UK web site
34	Best web site on the internet
35	Best use of interactivity on a web site

Your details

Name _____ Job Title _____
Company _____
Address _____
_____ Postcode _____
Telephone _____ Fax _____

The closing date for nominations is 25th April 1997. Please tick the box if you do not wish to receive promotional material. ☐

Gadgets

PCW Gadget Photography by David Whyte

InFocus LiteGo 320

Measuring a mere 74 x 262 x 396mm when folded, and weighing 4.2kg, InFocus's LiteGo 320 is the world's most portable multimedia projector. It's little larger than a notebook computer and should slip into most carrying cases. When you are ready to project, the unit unfolds for action. The image is produced with a 6.4in LCD panel and a 410W lamp. The 320 is compatible with PCs and Macs running at resolutions up to 800 x 600 pixels. and can display PAL, NTSC or SECAM video. Built-in rear-facing powered speakers complete the multimedia experience.

Price: £5,281.63 (£4495 ex VAT). InFocus UK 0181 213 2100

JVC GR-DVM1

Following JVC's GR-DV1 featured in last month's Gadgets is the GR-DVM1. Both are handheld digital video cameras with ten-speed optical zoom lens. The symmetrical vertical design allows right or left-handed operation and viewing through either eye. The GR-DVM1 is equipped with an LCD screen and is available this month. The DVM1 is slightly larger than the DV1, the world's smallest and lightest digital video camera. Nevertheless, the DVM1 only measures 59 x 156 x 94mm and weighs 730g with tape and battery.

Price, under £2,000 (or £1,702.13 ex VAT)
JVC UK 0181 450 3282

Psion Dacom Global Gold Card

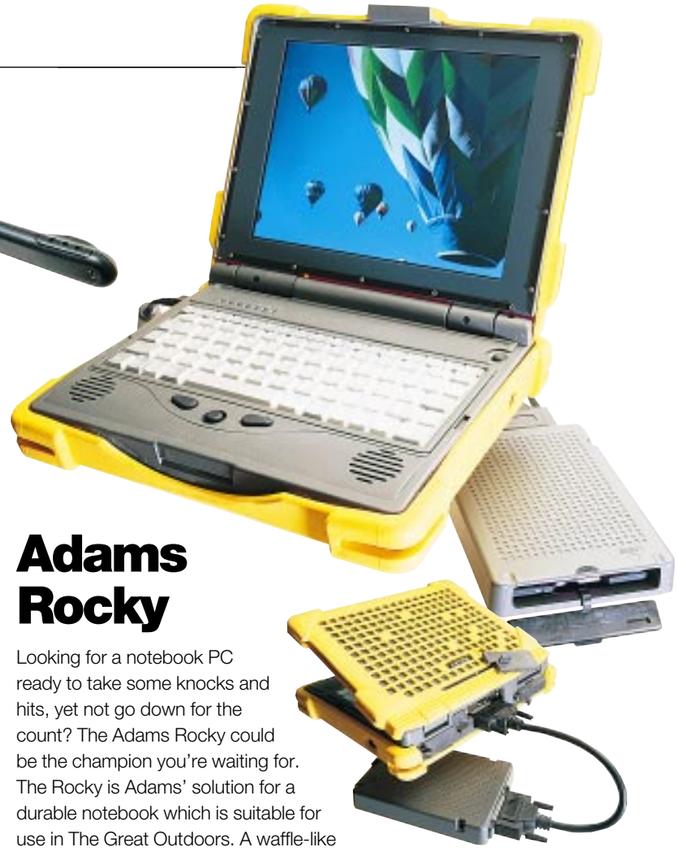
There's gold in them thar fax/modem cards. Psion Dacom has plated 25,000 of its new Gold Card Global GSM-ready fax/modem cards in real gold. This marketing ploy is not as expensive as you may think: it seems that coming up with a paint that looked like gold would cost as much as the real thing. The card offers a 33.6Kbps fax/modem with an optional mobile data upgrade; you'll also need a data-capable digital mobile phone. The standard modem card has a list price of £245.58 (£209 ex VAT). Upgrades to support a variety of mobile phones cost £163.33 (£139 ex VAT): the exception is for Nokia phones, £186.83 (£159 ex VAT).

Psion Dacom
01908 261686

Sony CMD-Z1

Years ago, Sony brought us the CM-R111, an analogue mobile phone which fitted the palm of your hand. A boom microphone sprung out from the side to reach your mouth. Fans of Star Trek-style communicators loved it but longed for a digital version with a display. Well, here comes the new CMD-Z1, which is based on a similar concept but operates on the digital GSM 900 system and boasts an enormous, detailed, display. It sits in your left hand, with your thumb hovering above a jog dial to select and execute its wide range of functions, leaving your right hand free. The Z1 is easy to use, works brilliantly and looks great. It will be available next month for between £150 and £200, with a suitable subscription to Cellnet or Vodafone GSM. A 9,600bps PC mobile data card with built-in 33.6Kbps modem will be available later.

Sony 0990 111999

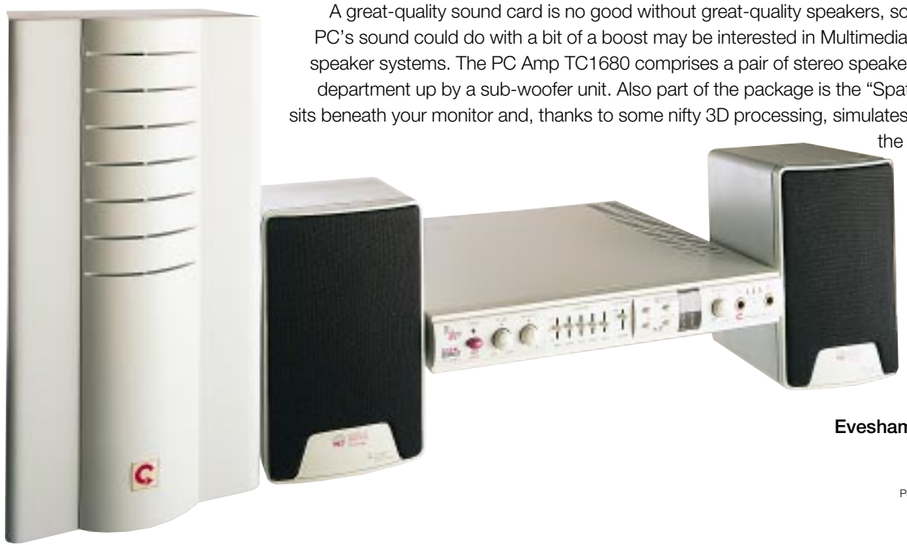


Adams Rocky

Looking for a notebook PC ready to take some knocks and hits, yet not go down for the count? The Adams Rocky could be the champion you're waiting for. The Rocky is Adams' solution for a durable notebook which is suitable for use in The Great Outdoors. A waffle-like rubber jacket protects the case, while the interior is dual-chambered to reduce the penetration of dust and water. It will even cope with a half-metre fall. Prince Naseem, watch out!

Price: £3,583.83 (£2,999 ex VAT)
Adams Technology 0161 283 1000

Multimedia Labs PC Amp TC1680



A great-quality sound card is no good without great-quality speakers, so anyone feeling that their PC's sound could do with a bit of a boost may be interested in Multimedia Labs' range of powered speaker systems. The PC Amp TC1680 comprises a pair of stereo speakers, reinforced in the bass department up by a sub-woofer unit. Also part of the package is the "Spatialiser", a slim unit which sits beneath your monitor and, thanks to some nifty 3D processing, simulates surround sound without the need for extra speakers. The amplifier supplies 22W per channel RMS (those are *real* Watts) and should keep anyone happy, from serious business users to hardcore games addicts.

Price: £222.08 (£189 ex VAT)
Evesham Micros 01386 765500

First Impressions

We have a pair of **Toshibas** under scrutiny, one of which is the **Tecra** (below), an MMX notebook, and the **SD-M1002** (p76), *PCW*'s first review of a DVD-ROM drive. There's a couple of printers from **Epson** (p83) and two digital cameras from **Sony** (p80). Software calls on **Borland Delphi** (p86), **Dr Solomon's HomeGuard** (p84) and **MacroMedia Flash** (p93).

Contents

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. The tests are continually developed and enhanced to reflect hardware and software 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 Doom 2 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, Euromark, is mainly Windows-based and 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

Personal Computer World Recommended

Toshiba Tecra 740CDT

Perfect for big-screen presentations, this MMX portable ushers in a new generation of notebooks.

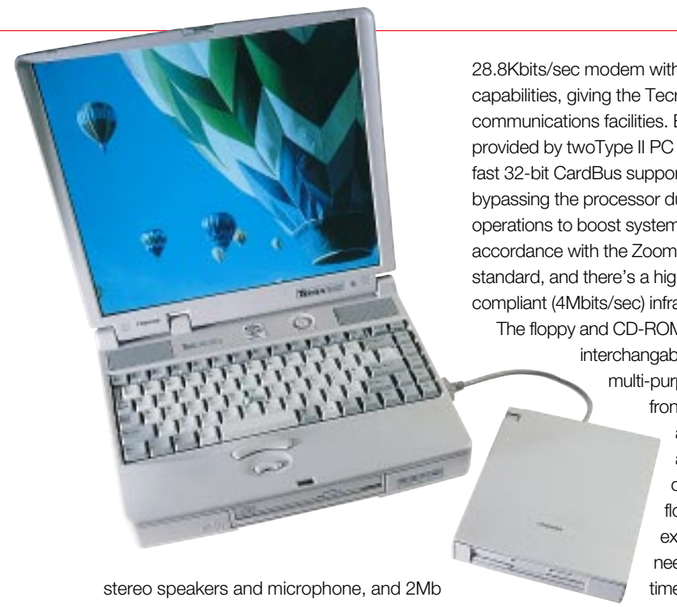
Toshiba's latest addition to its notebook range is the first in the UK (and on the market, according to Toshiba) to feature Intel's new MMX-enhanced Pentium processor. There are other MMX-based notebooks promised in the near future from IBM, Compaq and Fujitsu, and we'll be reviewing the NEC MMX offering in the next issue of *PCW*, but for now, the Tecra is it.

Fitting portables with the MMX makes a lot of sense, as the chip is good at improving the speed of audio and video decompression and playback which form a major part of notebook-based presentations. The MMX's low internal operating voltage yields benefits in terms of lower heat generation, with the "mobile" version operating at just 2.45V at its core, although externally it still runs at the standard 3.3V.

The Tecra's other distinguishing feature is its 13.3in TFT screen, which pretty much fills the available lid area and is as big as screens are going to get without abandoning the A4 format. The panel can operate at 1024 x 768 resolution, which is as far up as you can go without increasing the screen diagonal to produce a larger, more readable image. The only thing you could do to improve this impressive and usable screen would be to increase the colours it can handle, but the current 65,536 maximum is plenty for the reproduction of 24-bit photographic and rendered images without significant degradation.

Even taking into account dealer discounting of about 20 percent, the Tecra isn't exactly cheap, but it does pack a specification that puts plenty of desktop PCs to shame. The 166MHz MMX is backed up by 256Kb of pipeline burst cache and 16Mb of EDO RAM, and you get a voluminous 2.1Gb hard disk which is removable for easy storage, security, data sharing or even multiple OS usage.

In addition there's a ten-speed CD-ROM drive, integrated 16-bit audio with built-in stereo speakers and microphone, and 2Mb of dedicated video memory allowing 16-bit colour operation at 1024 x 768 resolution. The finished product will incorporate a 28.8Kbits/sec modem with fax and voice capabilities, giving the Tecra full communications facilities. Expansion is provided by twoType II PC Card slots with fast 32-bit CardBus support and capable of bypassing the processor during video I/O operations to boost system performance in accordance with the Zoomed Video standard, and there's a high-speed IrDA 1.1 compliant (4Mbits/sec) infra-red serial port.



The floppy and CD-ROM module are interchangable thanks to a multi-purpose bay in the front of the machine, and there's an adaptor for connecting up the floppy drive externally if it is needed at the same time as the CD-ROM.

We weren't too keen on the keyboard, which appeared to be the standard Toshiba offering and suffered from the usual lack of solidity. The keytops were loose and the action didn't have much character or resilience. The baseplate sagged and bounced during typing, which jarred with the top-quality feel of the machine.

As this was a prototype it would be unfair to publish benchmark results, but all the indications are that the Tecra will be fast by notebook standards. Running time will depend on the application, but it looks like the Li-Ion battery will last for two to three hours with the higher figure needing just light use of the CD-ROM and audio features.

Dominic Bucknall

PCW Details

Price RRP £5869.13 (£4995 ex VAT)
Contact Toshiba 01932 828 828
Good Points MMX power, screen size, modularity.
Bad Points The keyboard.
Conclusion Outstanding presentation tool or power-graphics portable.
★★★★★

p73 ➢

Hardware

Armari Arcturus 200 MMX R3D

This machine is tailor made for big games players — if you've got the wallet to match, that is.

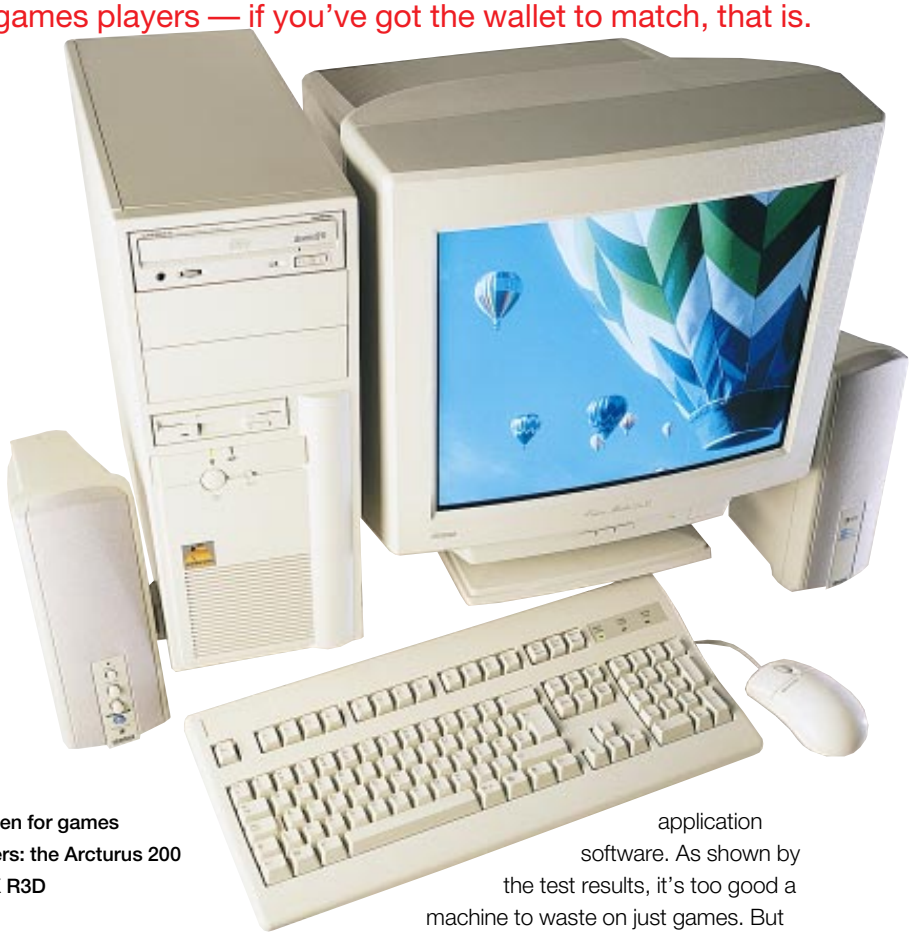
Armari says the Arcturus range is its attempt to create a PC as futureproof as possible. This model is aimed at the "high-end home user" — translation: keen games player — and is a real powerhouse, featuring an Intel 200MHz MMX processor, 32Mb RAM and two top-of-the-range graphics cards.

The Arcturus has a nicely styled mini-tower case which is easy to open. The interior is tidy and holds a Tyan Tomcat3 motherboard with the Triton 430HX chipset. There is 512Kb of soldered-on secondary cache and there are five ISA and four PCI slots (one shared), all of which can accommodate full-length boards. Two ISA and two PCI slots are filled, which still leaves plenty of room for expansion. There are two spare 5.25in drive bays and a mounting for an additional hard drive. The fitted 32Mb RAM occupies two of the eight 72-pin sockets which can support a huge maximum of 512Mb. However, the arrangement of the cabling and drive casings means that access to four of the SIMM slots is rather tricky. The motherboard supports USB and Armari says it will be supplying the sockets soon.

The hard drive is a 3.2Gb Quantum Fireball and the CD-ROM is a 12-speed Pioneer. Also supplied are a Diamond Supra Express 33.6Kbps voice modem, a Keytronics keyboard (nice action) and a Microsoft Intellimouse with the little wheel between the buttons. The audio side is well specified, with a SoundBlaster AWE 64 sound card and an excellent pair of Yamaha speakers. Considering the system is aimed at the games player, it's odd that Armari didn't see fit to include a subwoofer which adds a lot to the bangs, booms and crashes. A groovy space-age Creative Labs microphone is also supplied.

The Arcturus comes with the Matrox Millennium graphics card with 4Mb WRAM (upgradeable to 8Mb), a popular card in high-end systems. The Iiyama Vision Master Pro 17 is an excellent monitor and has a sharp display with bright, well defined colours and easy-to-use on-screen controls.

So far, so good. We've got a high-end machine with quality components that should run anything you throw at it faster than a rat up a drainpipe. But why is Armari targeting the games player? The answer is the Orchid Righteous graphics card, based on the 3DFX Voodoo graphics chip. This is a dedicated 3D card with 4Mb EDO RAM that slots in alongside the Matrox Millennium. The Righteous 3D won the Editor's Choice award in our recent 3D Graphics Cards group test *(PCW January)* and produces spectacular results with specially written 3D games.



Heaven for games players: the Arcturus 200 MMX R3D

Software includes Windows 95 and a selection of 3D games (most of which are limited in some way) including Descent II, Mech Warrior 2, Fatal Racing 3D, Actua Soccer: Semifinals 3D, Scorched Earth, Hellbender, and Monster Truck Madness. Written for the Righteous card, they go like the clappers with all the details on full.

Even the most ardent games player has to return to the real world from time to time and, after all, what's the point of having a PC if all you're going to do is play games on it? It would have been nice to receive some application software. As shown by the test results, it's too good a machine to waste on just games. But maybe I'll have just one more quick session before it has to go back...

Adam Evans

PCW Details

Price £2859.95 (£2434 inc VAT)

Contact Armari 0181 810 7441

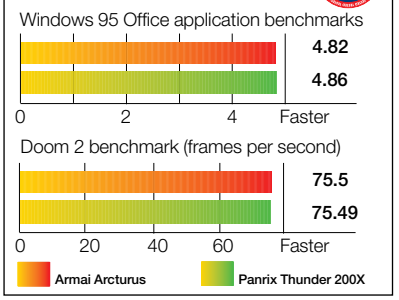
Good Points It's full of high-quality components and goes like a bomb.

Bad Points A subwoofer and some application software would have been nice.

Conclusion A great machine if you've got the cash.

★★★★

Performance results

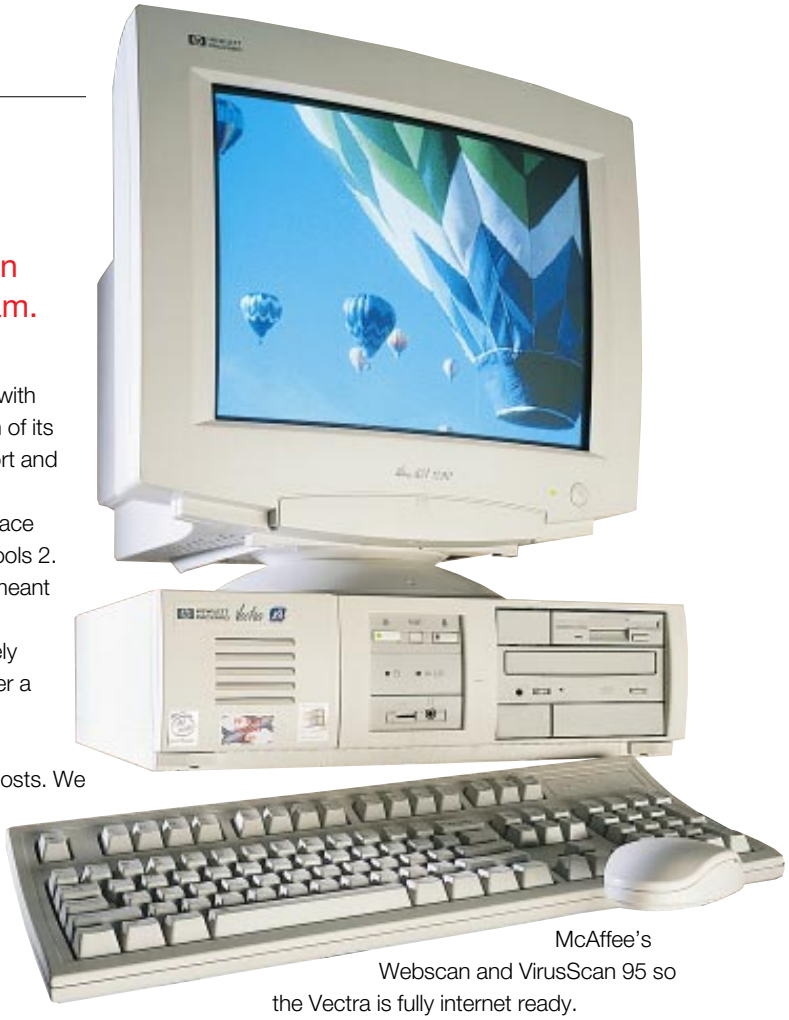


p75 ➢

Hardware

HP Vectra XA

Corporate style and power are incorporated in this impressively endowed IT manager's dream.



Performance isn't usually a term associated with a corporate PC, but with the introduction of the Intel MMX chip, Hewlett-Packard appears to have moved in this direction. Add to this mix a raft of new features such as integrated LAN connectivity, internet software, a desktop management interface (DMI) and Universal Serial Bus (USB), and you find that the HP Vectra XA is a serious high-end corporate PC.

The Vectra XA we looked at is an IT manager's dream. It came with a Pentium 200MHz CPU with MMX technology, Matrox Millennium graphics card with 2Mb WRAM, Creative Labs SoundBlaster 16 sound card, 10/100 Base-T Ethernet Controller, 32Mb of EDO RAM, 512Kb L2 cache, 2.5Gb Quantum TM2550A EIDE hard drive, and Hitachi eight-speed CD-ROM. Our Vectra XA also came with an HP Ultra VGA 1280 17in monitor, but this isn't included in the purchase price.

The desktop case isn't small but it is sturdy. There's a simple set of sliding latches to allow for easy access to the interior. Inside there are four slots positioned on a vertical riser board: one ISA, one ISA/PCI and two PCI slots (one occupied by the graphics card). On the opposite side of the riser board is the network card supporting 10/100 Base-T connections. There aren't any USB devices available yet but HP has included two USB ports for a bit of futureproofing. The interior is cramped but well arranged.

Hardware is fine and good, but two concerns sweeping IT departments are Total Cost of Ownership (TCO) and remote management. According to a landmark study by the Gartner Group, the cost of running a single PC, after purchase, ranges from between £5,000 and £8,000 a year once helpdesk, training, and maintenance are factored in. Multiply this by several hundred or thousand PCs and you have a hefty IT cost.

HP is focusing its efforts to address this issue with the implementation of its remote LAN support and integrated desktop management interface (DMI), called TopTools 2. Both of these are meant to allow a network manager to remotely audit and administer a PC via a LAN connection, thus reducing support costs. We were unable to test the full network functionality of these features but HP contends that an administrator should be able to turn on a PC, update software, re-flash the BIOS, run a remote hardware audit, and discover and troubleshoot any problems, such as potential hard drive failure, all from the comfort of their own desk. We did run TopTools 2 locally and were impressed with it. Everything, from CPU type and graphics card serial number to every IRQ and DMA setting, was scanned and available for analysis. As expected, there are built-in security features controlling conditional reboots and passwords.

HP has bundled Netscape Navigator 3.0 and Microsoft Internet Explorer 3.0, plus McAffee's Webscan and VirusScan 95 so the Vectra is fully internet ready.

On the performance side the Vectra XA has done well, scoring almost five times faster than our benchmark Compaq DX4/100. This is a respectable score when compared to a similarly specced, traditionally faster, high-end consumer PC like the Gateway 2000 P5-200 MMX PC which scored 4.79 in our Labs benchmark *(PCW March)*.

Dylan Armbrust

TopTools 2 is for network administration and management

PCW Details

Price RRP £2526.25 (£2150 ex VAT); with 17in monitor add £733.20 (£624 ex VAT)

Contact Hewlett-Packard 0990 474747

Good Points Fast. Good remote management features.

Bad Points Nothing worth complaining about.

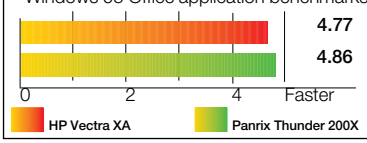
Conclusion Definitely a must-see for IT managers and budget makers.

★★★★

Performance results

VNU LABS

Windows 95 Office application benchmarks



p76 ➢

Hardware

Toshiba SD-M1002 DVD drive

If you've been divided on DVD, these reviews should convince you they're the last word in drives

After all the talk, the first DVD-ROM drive has finally arrived in the guise of Toshiba's SD-M1002. For those few in blissful ignorance of DVD, it is a high-density version of CD-ROM, carrying up 4.7Gb of data or a complete high-definition, multi-channel digital-sound movie. This new generation of drive is set to replace CD-ROM "sometime" in the next three years.

Since Toshiba believes that most first buyers of DVD-ROM drives will want to play movies, it is supplying the drive as a package with a PCI MPEG2/DVD video playback card. This particular drive was supplied with Quadrant's CineMaster DVD decoder card, still at the pre-production development stage.

The drive itself doesn't look much different to a standard Toshiba CD-ROM drive, the only giveaway being the DVD logo on the front and the extra DVD lead. Connections are absolutely standard ATAPI, and with Windows 95 is simply a matter of pulling out the CD-ROM drive and plugging in the DVD-ROM drive.

The DVD video card was only marginally more complex. The PC's monitor stays connected to the SVGA card and CineMaster feeds the video image to the SVGA card via the PCI bus. This does mean that the PC must support PCI bus mastering and the SVGA board also has to support DCI, Direct Draw or DirectX compatible drivers — i.e. the current range of better 2D/3D cards.

Quadrant has loaded the back plane of the card with a stereo mini-jack for the audio and a choice of an S-VHS connection and a standard (composite) video out on a phono. As a pre-production sample it had no digital audio out, but the final version will have an SPDIF socket to extract the Dolby AC-3 digital audio stream for decoding into true digital 5.1 channels. All these extra outputs are absolutely essential: DVD video is only worth having if you are going to play it out of your PC and onto a decent-sized TV with a big surround-sound system.

From the desktop, the SD-M1002 functions just like any other ROM drive, the only nifty feature being when you load a DVD disc, the drive's desktop icon switches to the DVD logo. Put in an ordinary CD-ROM and it performs with the data transfer and access times of a seven-speed ROM drive. The only thing it won't do is play CD-R discs. That will have to wait until another generation of drive.

CineMaster came with no playback software, although a user interface to play all types of videodiscs will be supplied in the final version. A trusty Media Player brought the card to life, putting video on both the PC monitor, a TV and a surround system. On a limited range of software, the image quality on the TV output is pretty damn good with none of the "blocking" that makes MPEG1 sub-VHS quality.

The images are crisp and certainly close to the best laserdisc standard, but it was a different matter on the monitor — no blocking, but a very lined image due partially to the way Direct Drive scales the image for the VGA board. It proved a disappointment, as there was little obvious difference between DVD video and well encoded MPEG1.

Some of these problems may be sorted out by the release date (May) but it looks as though DVD video on the PC may have a rough ride in the early days.

Tim Frost

Hitachi GD-1000

Not to be outdone, Hitachi managed to get us a sample of its GD-1000 DVD-ROM drive just before we went to press. Like the Toshiba, it plugs into the PC with ease, simply replacing the existing ROM drive and using a standard EIDE controller. The two drives look much the same, the only overt differences being the GD-1000's slightly slimmer tray front and the use of just one LED to indicate that a DVD disc has been loaded.

The GD-1000 behaved impeccably on DVD-ROMs and, if anything, was marginally faster than the Toshiba on CD-ROM, although not enough to be significant in any real application. Like the Toshiba, it came bundled with the CineMaster card to check the drive's functions with DVD-Video. Hitachi says it will not be selling an own drive/card package. Instead, it will supply the drive and leave it to others to create packages.

This version of the card came with marginally later drivers that seem to go a long way to resolving the line problem on the monitor view (the TV picture was still excellent). But that doesn't mean these types of cards are not going to be a bit unpredictable for some time to come, so again it's thumbs up for the DVD drive, but watch it on the decoder card.

Expected price £400
Contact Hitachi 01628 585000

PCW Details

Price Drive £400; Drive/MPEG2 card £800 (estimates only)
Contact Ideal Hardware 0181 289 5000
Good Points Be first on the block with DVD.
Bad Points Nothing to play on it yet.
Conclusion Marks the start of DVD-ROM, and stops you having to shell out a further £600 on a DVD-Video player. Best to wait till the autumn for the drives to settle down in price and the teething problems with the cards to be sorted out.

p78 ➢

Hardware

Sony DSC-F1 & DKC-ID1

The undisputed master of consumer gadgetry is spot on with these digital cameras.

Personal Computer World Recommended

You wait ages for a Sony digital camera to arrive, then two come along at once. To be honest, the higher-end DKC-ID1 beat the consumer DSC-F1 by a few months, but I won't let that get in the way of a cliché.

Sony has two very distinct styles and these cameras are perfect examples of each. Shouting consumer gadgetry all over the place is the DSC-F1, while the DKC-ID1 conservatively assures the serious user and heralds from Sony's Broadcast and Professional UK Division.

The £1,499 DKC-ID1 is a large, flat camera weighing 750g with the supplied rechargeable battery, measuring 128 x 65 x 145mm and shaped not unlike Kodak's DC-50. Like the DC-50 it features a motorised zoom lens, but Kodak's three times is easily beaten by Sony's huge 12 times, a range equivalent to a 38–460mm zoom on a 35mm film camera. You'll need to hold steady when completely zoomed in, and bear in mind the built-in flash is only effective over small distances. Sensitivity is equivalent to 100 ASA (ISO) film.

The viewfinder is a colour LCD, similar to the ones found on camcorders, and despite flickering, indicates exactly what you're going to get, or already have got. In use the DKC-ID1 feels much like a cross between a still camera and a camcorder. Focus and exposure are manual or automatic, with shutter speeds between 15th and 4000th of a second. Closest focusing distance is 0.8m at any zoom setting.

Resolution is 768 x 576 pixels and the quality's good. Images are stored in JPEG format on Type-II PC (formally PCMCIA) Cards, with either 42 or 158 stored per 10Mb memory depending on compression. TWAIN-acquiring drivers are supplied for Win95, 3.x and Mac, and images can be transferred by physically removing the card or connecting to the built-in SCSI-II interface.

Moving swiftly on to the utterly gorgeous DSC-F1, which immediately wins over anyone who has a go with it — Sony really is a master at consumer gadgetry. It measures 102 x 78 x 41mm, weighs 135g with its supplied rechargeable battery, and is finished in a lovely silvery coat.

Like the Casio cameras, Sony's DSC-F1 features a lens section which can rotate through 180 degrees for self portraits, or at its halfway position is handy for shooting at low heights. Also like the Casios, the Sony features a colour LCD screen on the rear for composing or reviewing images. Unlike the Casios, the Sony boasts a flash, built into the rotating lens section and operating between 1m and 3m. Do bear in mind that LCD panels drain batteries very quickly.

The autofocus lens is fixed focal length, equivalent to 35mm on a 35mm film camera. A macro mode will focus as close as 0.08m. Image resolution is 640 x 480 pixels, and the 4Mb built-in memory can store either 30, 58 or 108 pictures at the three levels of JPEG compression. Image quality is as good as the best 640 x 480 pixel cameras we reviewed in our February group test.

Sony has also taken the lead in terms of connectivity. The DSC-F1 features a serial port for wired links to PCs or Macs, an IrDA compliant infra-red port, and even a composite video output for display on TV or video — you could use a DSC-F1 and TV for presentations. Particularly cunning is the £400 optional dye sublimation mini colour printer, which produces 6in x 4in prints and talks to the DSC-F1 by infra-red.

At £595, the DSC-F1 is considerably more expensive than other 640 x 480 pixel LCD viewfinder cameras, but knocks them all into a cocked hat in terms of quality, features and sheer good looks. It is simply adorable and comes highly recommended. The DKC-ID1 can't compete in looks, but offers excellent quality and a huge range of options — ideal for the more serious user.

Gordon Laing

PCW Details

Sony DSC-F1 Personal Computer World Recommended

Price RRP £699.12 (£595 ex VAT)

Contact Sony IT Group 0990 424424

Good Points Great design, features and quality.

Bad Points Pricey compared to its (inferior) competitors.

Conclusion The best consumer digital camera.

★★★★★

Sony DKC-ID1

Price RRP £1761.32 (£1499 ex VAT)

Contact DirekTek 01494 471100

Good Points High quality, large zoom and advanced facilities.

Bad Points Not particularly user friendly.

Conclusion Better suited for pro applications.

★★★★

p80 ➢

Hardware

Epson Stylus 800 and Stylus 600

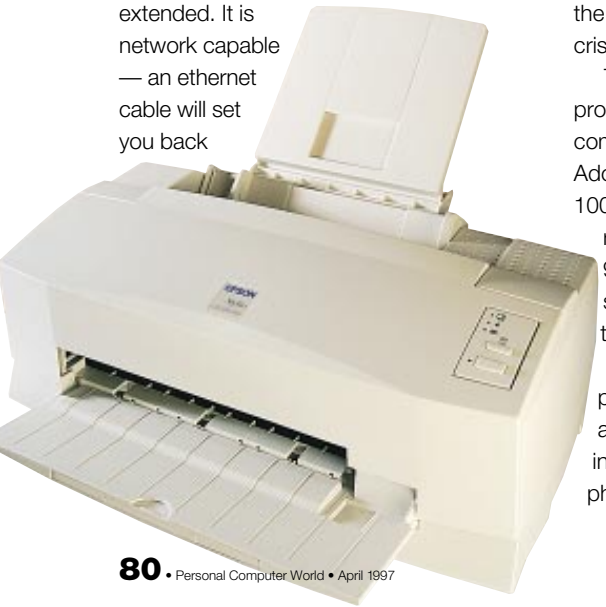
Fine colour output distinguishes both these printers, ideal for small business and home use.

These two printers are the latest additions to Epson's Stylus range, replacing the Stylus Pro and the Stylus 500 respectively. Epson has upped the colour dpi output from the previous maximum of 720dpi, to 1,440dpi. Both models are dual-cartridge four-colour printers.

Costing less than their predecessors, these latest printers show a marked improvement in colour output. The increased dpi is due to a refinement of the Micro Piezo printhead, which forces the ink out faster and in smaller droplets, and a new driver, which employs AcuPhoto Halftoning. The new Quick Dry Ink is worth a mention, as it really does live up to its name.

Epson promises that these printers deliver crisp, laser-sharp mono text and they do, but only when using 720dpi coated inkjet paper. At this resolution, one page took almost a minute to print, and the paper costs 12p (RRP, inc VAT) per sheet. On plain photocopier paper, text was blurry and feathered with noticeable ink bleed. But if you're looking for colour output, these printers produced excellent colour images.

The Stylus 800 is aimed at the high-end SoHo market but will be most applicable for small businesses. It's more stylish than its predecessor, the Stylus Pro, and has a footprint of 630mm x 470mm with the paper trays fully extended. It is network capable — an ethernet cable will set you back £359 (RRP, ex VAT) — and has a data transfer rate of 1.8Mbits/sec.



The single motor previously used has been replaced with three motors, and what a difference this has made. The 800 lapped the Pro in the text/speed test, performing an incredible 32.65 seconds faster when printing ten pages. The motors do make this a noisy printer, definitely not the sort you'd want work close to. Even a print run of ten pages will drive staff in a small, crowded office up the wall.

The colour images produced by the Stylus 800 are excellent whether at the full 1440dpi on glossy film or at 720dpi on coated inkjet paper. At 1440dpi the image is marginally cleaner and sharper, better capturing the fine details, and obviously the glossy paper makes images look much more impressive. But if you are on a budget the coated paper images are still startlingly crisp, either at 720dpi or 1440dpi.

The Stylus 600 is more suited to professionals who work from home and comes bundled with Sierra Print Artist and Adobe Photodeluxe, along with an extra 100 photos and 25 fonts. The data transfer rate has been increased to 900Kbits/sec. It's quieter than its big sister, the Stylus 800, so it won't wake the baby.

Despite the extra nozzles in the printhead, the Stylus 600 performed about the same as the older Stylus 500 in the text/speed test. A full-page colour photo took almost thirteen minutes to print at 1440dpi on glossy film. The paper feed has been improved and now ejects sheets smoothly, without sticking.

Epson printers are fussy when it comes to paper, and for best results it's advisable to use Epson's own brand paper. Photo Quality Inkjet paper costs £12.33 (£10.49 ex VAT) per 100 sheets, and Photo Quality Glossy film costs £27.01(£22.99 ex VAT) per 15 sheets. New on the market, Photo Quality Glossy paper falls somewhere between the two in quality and price. Cartridges cost £19 (RRP, ex VAT) for three colour, and £18 (RRP, ex VAT) for three black.

Lynley Oram

PCW Details

Stylus 800

Price RRP £480.58 (£409 ex VAT)

Contact Epson 0800 289622

System Requirements Windows 3.1, 95, NT; Macintosh. Emulation: Epson ESC/P2, IBM X24E, Epson Remote, PostScript Level 1 & 2.

Good Points Good colour, quick-dry ink, easy to use, stylish.

Bad Points Far too noisy.

Conclusion Perfect for doing presentation documents on.

★★★

Stylus 600

Price RRP £329 (£280 ex VAT)

Contact Epson 0800 289 622

System Requirements Windows 3.1, 95; Macintosh. Emulation: Epson ESC/P2, Epson Remote

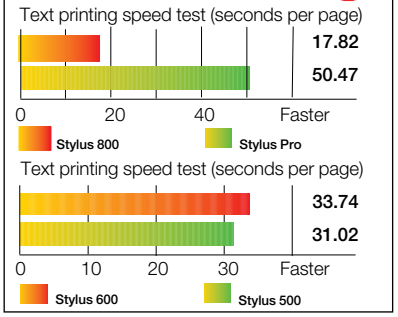
Good Points Quiet, quick-dry ink, easy to use.

Bad Points Doesn't print crisp black text on plain paper.

Conclusion Not bad for a home printer. Could be useful for printing colour newsletters and the like.

★★★

Performance results



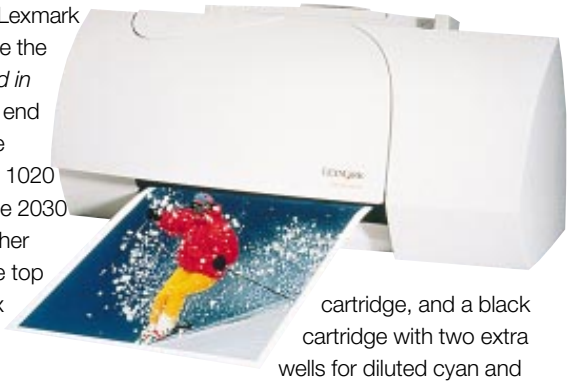
p83 ➢

Hardware

Lexmark 2030 Jetprinter

Lexmark's "hexacolour" technology is a feature of this printer, but performance is disappointing.

The latest addition to the Lexmark stable fits neatly in beside the 1020 Jetprinter (*reviewed in PCW November 1996)* at the lower end of the company's printer range. The difference between them is that the 1020 is a single-cartridge printer, while the 2030 is a dual-cartridge printer. Unlike other printers of a similar price range, the top resolution of the 2030 is only 600 x 300dpi,which some may feel is a little low.



Setting up is relatively easy. You need to align the printheads when installing the drivers, or your prints will end up running off the edge of the paper.

The main development has been in the type of cartridges used. The 2030 uses a technology which Lexmark has named "hexacolour". This basically uses two cartridges — one standard CMY colour cartridge, and a black cartridge with two extra wells for diluted cyan and diluted magenta. These added colours are intended to import pastel shades, so are better for sky and skin tones, details and highlights. Unfortunately, this new technology does little to enhance the printer's performance. The output in photographic mode is distinctly dull and lacks smoothness and crispness. To add insult to injury, a full-page colour photograph came out with banding, the same fault repeating no matter how many times we printed it.

In graphics mode for illustrations, however, the output is much better. But be warned: the ink does take some time to dry, and although there is a box in the drivers for a "dry time delay", if you want to print quickly the ink will smear and bleed and the paper will be very wet.

Adele Dyer

PCW Details

Price SRP £200 (£235 inc VAT); Street £199 (£169.36 inc VAT)

Contact Lexmark 01628 481500

Good Points Good, bright colours in graphics mode.

Bad Points Ink slow to dry, occasional banding.

Conclusion Not Lexmark's best printer.

★★

Yamaha SW60XG

Personal Computer World Recommended

This daughterboard really does make sweet music, taking wavetable synthesis to a new level.

Daughterboards offering wavetable synthesis are nothing new. By fitting one piggy-back style to an existing sound card, MIDI playback is elevated from the embarrassed efforts of FM synthesis into the rich and realistic realms of sampled sounds. At least, that's the theory, but unless the existing sound card has a suitable connector, a wavetable daughterboard can't be used. The solution used to lie in chucking the old sound card away and buying one that either had a daughterboard (or "waveblaster") connector or wavetable synthesis built in. Yamaha has now provided a neat alternative in the shape of the SW60XG.

The SW60XG is based on Yamaha's enormously successful DB50XG wavetable daughterboard but has a cunning twist. Rather than fit physically onto an existing sound card, the SW60XG is a 16-bit ISA card and so only needs a vacant slot.

The half-length SW60XG isn't for games players — it doesn't offer FM synthesis or SoundBlaster emulation and has no MIDI/joystick port. This does mean, however, that it doesn't need an IRQ or DMA channel, so installation is extremely straightforward.

The SW60XG (like the DB50XG) uses Yamaha's extensions to the GM (General Midi) standard, called XG. XG is upwardly compatible with GM but offers improved voice editing, sophisticated effects control and a larger set of voices — anything from 480 up, and the SW60XG has 676. XG supports real-time effects for external inputs and the SW60XG has three 24-bit DSPs.

The sound quality of the SW60XG is nothing short of excellent. Its 4Mb of wavetable ROM and 18-bit D-to-A converters make for impressive playback even with standard General Midi pieces. With a custom XG MIDI piece, however, wavetable synthesis is taken to a new level. A CD-ROM sampler of XG MIDI pieces ranging from the Eurythmics to Jimi Hendrix is supplied, and vocals aside, playback is almost indistinguishable from the original.

Julian Prokaza

PCW Details

Price £149 (£126.80 ex VAT)

Contact Yamaha 01908 366700

Good Points Simple installation, sound-card independent, fantastic sound.

Bad Points None.

Conclusion Superior wavetable sound simply cannot be had for this price. Superb.

★★★★★

p85 ➢

Software

BETA

Dr. Solomon's HomeGuard

This inexpensive cut-down version of Anti-Virus Toolkit will bite the bugs for Windows users.

Dr. Solomon's is well-known for its Anti-Virus Toolkit, widely regarded as one of the leading anti-virus products. But the Toolkit is expensive compared to many rivals aimed at the home market. To address this, Dr. Solomon's has launched HomeGuard, a cut-down version which sells at an attractively low price.

Most anti-virus products, even budget ones, have two separate components: an on-demand scanner that you run when you want to check for viruses, and an on-access checker that runs in the background and ensures that each file is virus-free before you load it. The advantage of the on-access checker is that it's automatic, so there's no risk of loading a file which hasn't been virus-checked.

However, HomeGuard doesn't include an on-demand scanner (virus-savvy readers, throw up your hands in horror). The result is that HomeGuard users have no way to overtly check that the file they were given by a friend, or downloaded from the internet, is free of viruses before they use it. In practice, this isn't as bad as it sounds because HomeGuard's on-access checker, WinGuard, is every bit as effective as a top-class on-demand scanner and won't allow you to load or run an infected file.

WinGuard works only while Windows is running, so if you boot to DOS your system may have no virus protection. The package does include VirusGuard, an on-access DOS virus checker, but this isn't the ideal solution for the home user and it's not as effective. The memory it consumes may not leave enough available for some games to run, so users may be reluctant to install it.

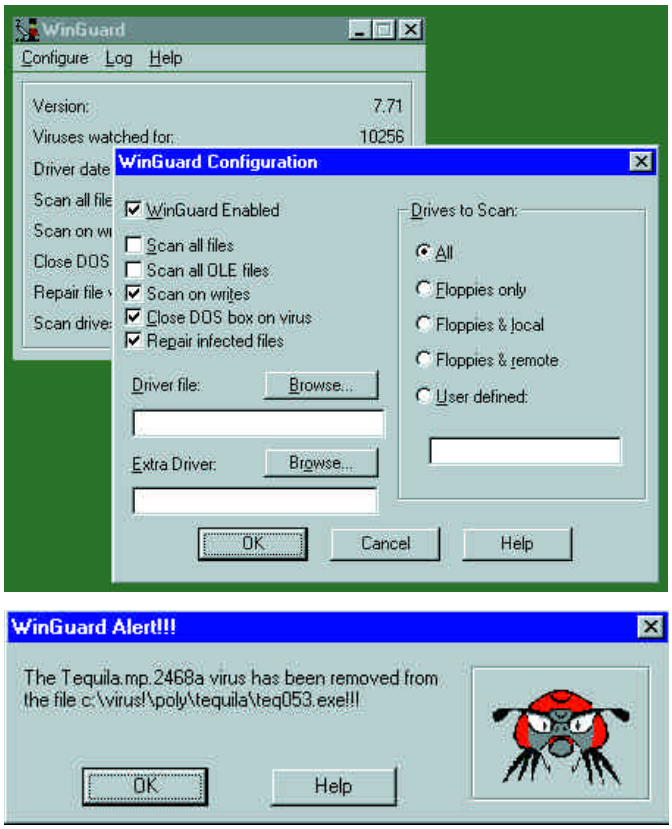
WinGuard's only interface is a status panel (normally hidden) from which you can access a couple of configuration dialogs. These enable you to change the text of warning messages, specify what disks and files are scanned, and choose whether to log detected viruses to a file. One option, to scan on writes, should be the default, especially for those with internet access as it allows infections to be detected when files are extracted from email messages and ZIP archives. Configuration changes take effect only after Windows has been restarted: fortunately, the options are not things you will need to change very often.

At installation time you must choose whether or not you want WinGuard to repair infected files on the fly. With this option, all you will normally see when you load an infected file is a message telling you that virus X has been removed from file Y. This is a particularly convenient way of dealing with Word macro viruses. In tests, WinGuard cleaned nearly all of our virus samples and almost 100 from a larger sample of more than 600 types. However, some of the cleaned files weren't repaired to their original state, and a few crashed when run.

The problem of imperfect repairs is one that affects most anti-virus products, though those that use integrity checking (which WinGuard doesn't) generally do a better job. WinGuard's repair facility is worth having but deleting the infected file and then restoring a clean copy from a backup is a safer option.

To clean up widespread infections and check out machines that won't load Windows, HomeGuard includes the Magic Bullet, a bootable disk containing a DOS virus scanner. You put the Bullet in drive A, reboot the PC, and choose an option to scan only, or scan and repair the system. In the absence of an on-demand scanner the Magic Bullet is the only way to check your entire hard disk for viruses. It's also an extremely easy and foolproof way to clean an infected PC. Note, though, that the version we tested did not support the new FAT32 file system available in some versions of Windows 95.

Julian Moss



Top WinGuard's interface consists of a couple of configuration dialogs that you'll rarely need to touch

Bottom With the automatic repair option, this is all you see when you load an infected file

PCW Details

Price £29.95 (inc VAT); one free upgrade included

Contact Dr. Solomon's Software 01296 318800

System Requirements Windows 3.1 or Windows 95.

Good Points Automatic. Easy to use, top-class virus detection.

Bad Points No on-demand scanner. Limited DOS support.

Conclusion Inexpensive, effective virus protection for Windows users

★★★★

p86 ➢

Software

Borland Delphi 3.0 BETA

Personal Computer World Recommended

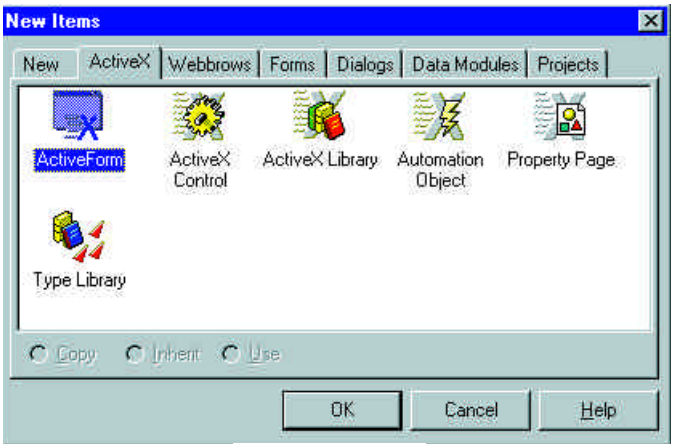
ActiveX and other new features make this a more attractive Windows development tool.

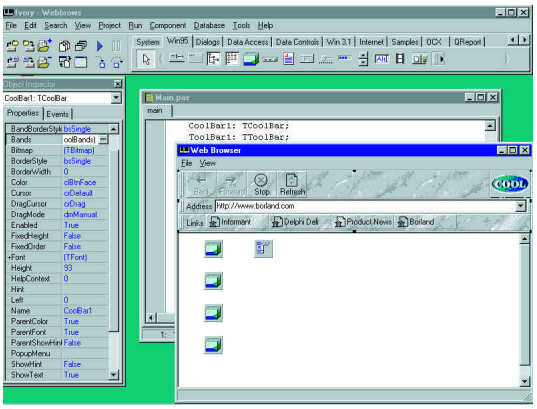
The heart of Delphi is its Visual Component Library, or VCL, a Pascal class library that encapsulates the Windows API (Application Programming Interface) into a series of components which you can snap together visually. Delphi components perform well and can easily be enhanced using standard object-orientated techniques.

In the past, the only problem with Delphi components has been that they only worked in Delphi. Now, a new ActiveX Control expert lets you convert a VCL component. So, you can take a Delphi component, make it into an ActiveX control and use it in Visual Basic, Word, Internet Explorer, or any other ActiveX client. An enhancement to the TOleComponent now allows you to display ActiveDocs or DocObjects, another key ActiveX feature.

Ironically though, one of Delphi's best features has also proved to be a weakness. Unlike Visual Basic, a Delphi application compiles into a standalone executable that does not require runtime support files. It simplifies distribution and version control but makes for large executables because substantial chunks of library code are bundled into them. However, Delphi 3.0 incorporates packages. In our tests a simple application which compiles to 200Kb without runtime packages, reduces to 11Kb when packages are used. Larger applications benefit less but you can create your own packages if you want to share runtime components between apps. It also speeds compilation and saves resources at runtime.

ActiveX and packages are the two major new Delphi features, but there are other enhancements. Although it was not working properly in this beta, an Access driver has been provided for the database engine. Judging by its name, IDDAO32.DLL, it calls Microsoft's JET engine through Data Access Objects. There is support for FoxPro memo fields and CDX indexes.





Above Selecting the ActiveX tab for a new project shows a full range of options Left The TCoolBar component lets you create applications with the Internet Explorer look and feel

Borland will no longer be developing ReportSmith, the unwieldy reporting tool previously shipped with Delphi, and has sub-licensed its development to a third party. The focus seems to be shifting to the bundled Quick Report, also a third-party tool but written in native Delphi. Both Delphi and the Borland Database Engine have new multibyte character features for international language support.

Several new components have been added. TCoolbar has toolbars like those in Internet Explorer, and flat buttons which turn to 3D colour under the mouse. TAnimate shows an AVI animation. TSplitter creates splitter windows and TThreadList is a thread-safe list.

There are some changes in the editor, too. An "Evaluation hints" debugger option displays the value of any variable or property as tooltips in the editor window. A keystroke combination in the editor summons pop-up code templates which automatically enter common structures like "while" statements and exception blocks. Assertions have been added to the language, a welcome debugging enhancement. Net developers will find new components for developing web server applications like those which generate HTML in response to database queries. Microsoft and Netscape servers are supported.

Borland has done the right thing with Delphi, bringing it fully into the ActiveX universe. Delphi's great strength is as an all-round development tool, combining visual development with low-level language features when required, but it is not necessarily the best choice for client-server development. For general-purpose Windows development, though, Delphi does look increasingly attractive.

Tim Anderson

PCW Details

Price Learn To Program version £49.95 (£42.51 ex VAT); Standard version £89 (£75.74 ex VAT); Professional version £468.82 (£399 ex VAT); Client/Server version £1,526.32 (£1,299 ex VAT)

Contact Borland 0800 454065

System Requirements Windows 95, Windows NT 3.51 or higher.

Good Points Full ActiveX support. Runtime library option. Slick new components.

Bad Points Weak ODBC support. Not portable to other platforms.

Conclusion The best Windows development tool.

★★★★★

p88 ➢

Software

HoTMetaL Intranet Publisher

Present information straight from the HiP on intranet pages. Some of the views are Cyberbolic!

If you believe the hype, the internet is old hat. The real action is going to take place on the intranet: internal company networks, where useful information will be disseminated to employees via web browsers so that all have easy access to the information they need to do their job. Cynics might say there are, perhaps, only three companies which will do that, but SoftQuad believes there will be many more, and its HoTMetaL Intranet Publisher (HiP) is designed to make it as easy as possible to provide information over an intranet.

HiP is based around the HoTMetaL HTML editor and there are two other main parts to the system: the HiP Information Manager, and the HiP Viewer. The Information Manager is at the heart of HiP; it provides you with an overview of your "project", which is a collection of web pages, style sheets and associated information. You can launch the editor to update a page, or automatically transfer a set of pages to a remote server with a single button. There's also a tree view of your site, and a Cyberbolic (yes, really!) view which shows all the links between pages and indicates whether any are broken.

So far, so good; but what's the difference between that and an application like MS FrontPage? HiP provides tools to create pages that will be easier and more useful for people on intranets. The most startling addition is User-Defined Extensions. These are extensions to HTML that you can edit in the Information Manager and then use when you create pages in the editor. It sounds like an odd idea at first, but it's actually quite powerful. The page shown in Fig 1 lists magazines, article titles and synopses. Each of these can be given a user-defined tag. Not only does it make it easier to mark-up pages consistently, but it also enables views — one of HiP's most useful features. And this is where the HiP Viewer comes in. It's a plug-in for both NetScape and Internet Explorer which reads the extra information that HiP embeds in your pages to provide a split screen (Fig 2); on the left you have viewer controls and a table of contents, while the page itself appears on the right.

The views option uses style sheets to provide different views of your page. For instance, the "Summary" view of our test document (Fig 2) makes article synopses invisible, so you only see the titles. You can have as many views as you like, allowing a single document that can display different information depending on the view that's been selected. Automatic tables of contents can also be created for your pages, specifying, for instance, that Magazines and Articles be listed. And you can also provide pop-ups which give extra information about specific items in the text, or "multi-links" which provide a single point for a whole menu of links. With the HiP Monitor, which runs on your web server, you can also arrange for people to receive email when a page that they've "subscribed to" changes, and for adminstrators to receive notification of other events.

HiP is a comprehensive tool. The addition of pop-up text and automatic tables of contents to web pages will allow you to create easier-to-use intranet pages than standard HTML. But does your company believe in sharing information?

Nigel Whitfield

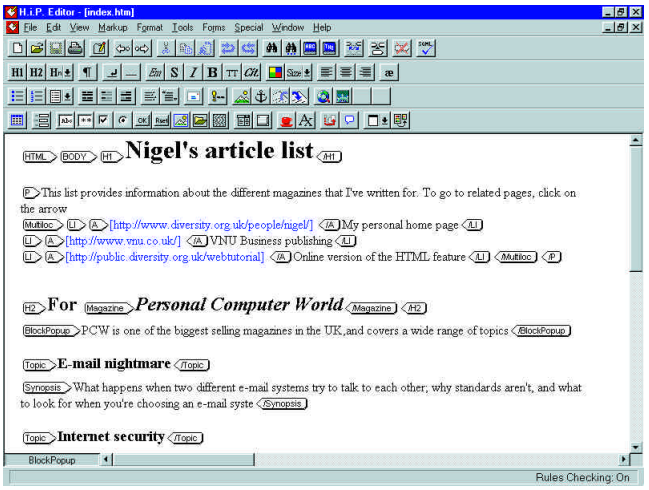
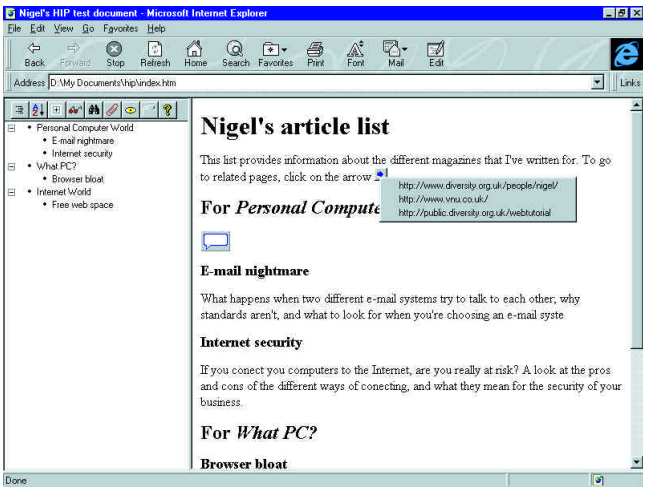


Fig 1 (left) The HiP editor is based on HoTMetaL Pro with additional support for user-defined tags, pop-up text and multi-link lists

Fig 2 (below, left) The Viewer is a plug-in for both NetScape and Microsoft web browsers, and allows you to select different views of the information on a page



PCW Details

Price £351.33 (£299 ex VAT)

Contact SoftQuad 0181 387 4110

System Requirements Windows 95 & NT (HiP Editor & Manager), Windows NT, Sparc Solaris, HP-UX (HiP Monitor).

Good Points Adds great flexibility to intranet pages, with the ability to create different views of information.

Bad Points Some of the concepts can be hard to work out at first. No Macintosh viewer yet.

Conclusion If you have a PC-only network, then this is a great way to put together information that needs sharing.

★★★★

p90 ➢

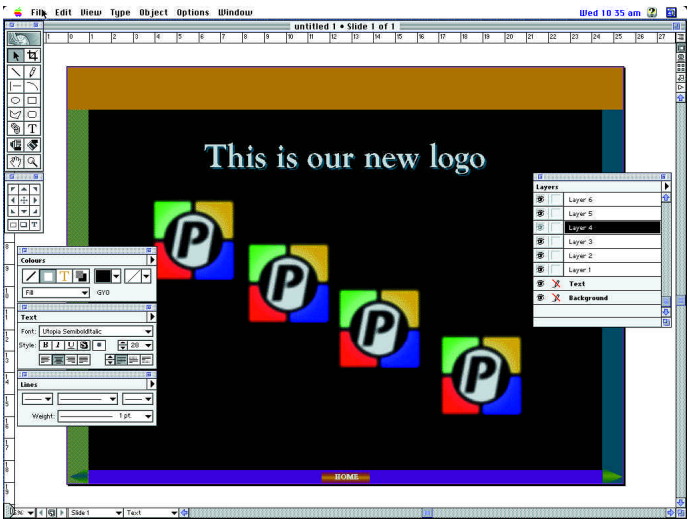
Software

Adobe Persuasion 4.0

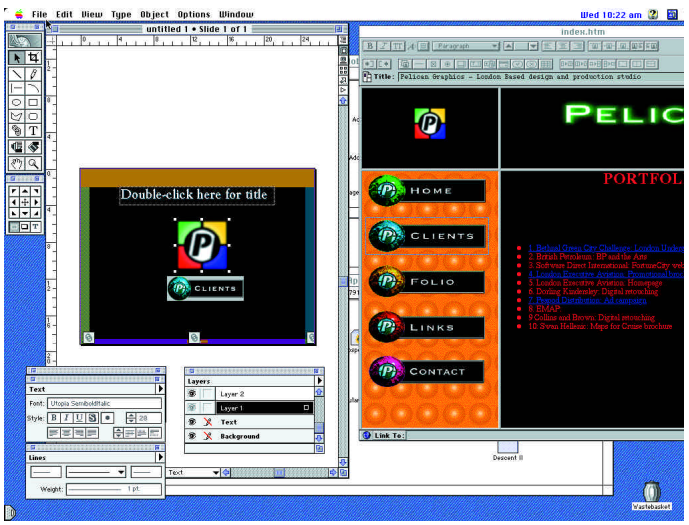
Be persuaded by this new version with cross-platform compatibility for presentation creators.

Persuasion will be familiar to Mac users, and the enhancements in this new version make it a worthy competitor to Powerpoint. A redesigned interface makes the job of creating presentations much easier by providing an environment consistent in appearance to other Adobe products like PhotoShop. Persuasion now integrates well with other Adobe products, but this integration goes further than dropping in the odd picture from Photoshop. You can now work on a drag-and-drop basis with native files from Photoshop and Illustrator, so you can keep your layered images intact and there's no need to keep two copies of everything.

Right Floating palettes keep everything close to hand



Below Linked graphics are being pulled in from PageMill. The links are maintained when the Persuasion presentation is converted to a pdf document using Distiller 3.0



Persuasion is now web-friendly. Web-site authors who want to link pages with a Persuasion presentation can do so easily by dragging and dropping links and URLs from the title bar of a browser (or via Adobe's HTML authoring tool, PageMill) onto the text within a Persuasion slide. Or, Persuasion presentations can be made internet and intranet accessible by converting them to Acrobat pdf format (Acrobat Distiller and the reader are included). Links management has been introduced to the Mac version and enhanced in the Windows version.

Working within Persuasion it is possible to create a straightforward, no frills 10-slide show in about as many minutes. Anyone who has used Powerpoint or other presentation packages will have no problems adapting. Small buttons in the upper right of the edit window take you into the outline view (key in the text for the whole presentation and slides are created to style), the slide edit window (work on a page at a time), the slide sorter (thumbnails of everything), a preview of the current slide, and the player.

The edit window is where most of the creative stuff happens, so when this is selected half a dozen palettes become available. These provide control over everything from type size and colour to drawing tools, to layer control. But Persuasion falls a little short on effect and animation tools. The basics are there, but anything more sophisticated would have to be produced in something like After Effects and incorporated as a QuickTime movie.

Persuasion looks almost identical on the Mac and the PC. Cross-platform operation is good, making it an ideal tool for a mixed platform environment or, say, where you want to create on a Mac but play on a PC. Adobe provides both versions with a dual licence so you can install it on both Mac and PC. You can even pass the second copy to someone else if you don't need it.

With its improved integration and multitude of new features, Persuasion 4 is well worth looking at, either for first timers or those wanting to upgrade. As an incentive to Powerpoint users to migrate, Adobe provides a Powerpoint-to-Persuasion conversion utility so you can, with a little tidying up here and there, pull in Powerpoint files and continue to work on them in Persuasion.

Ken McMahon

PCW Details

Price Street £222.08 (£189 ex VAT); Upgrade £81.08 (£69 ex VAT)

Contact Adobe Direct 0131 458 6842; www.adobe.com

System Requirements Mac, Windows 95 or 3.1.

Good Points Integration with other Adobe products. Dual Mac/PC licence. Cross-compatibility. Free Acrobat Distiller.

Bad Points Needs support of other Adobe products to create truly eye-popping presentations.

Conclusion An excellent choice, especially for those already using Adobe products.

★★★★

Software

Macromedia Flash

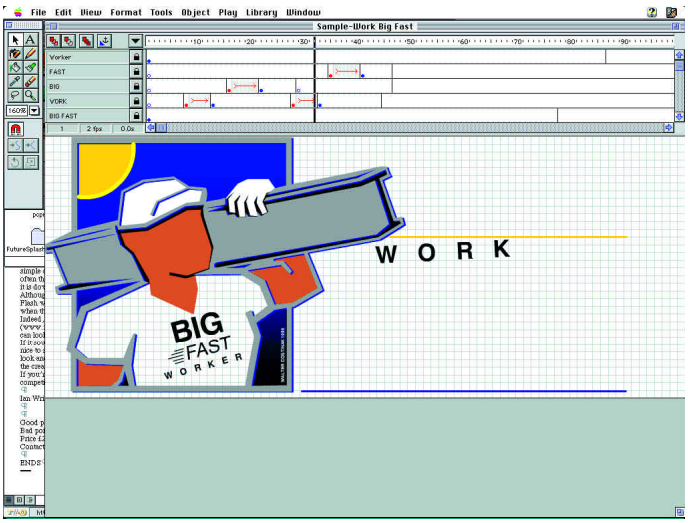
Personal Computer World Recommended

Add a flash of brilliance to your web-site animations or interface with this easy-to-use program.

Flash has been around for a while in the guise of FutureSplash Animator. A buy-out by Macromedia should see this excellent product reaching a larger market.

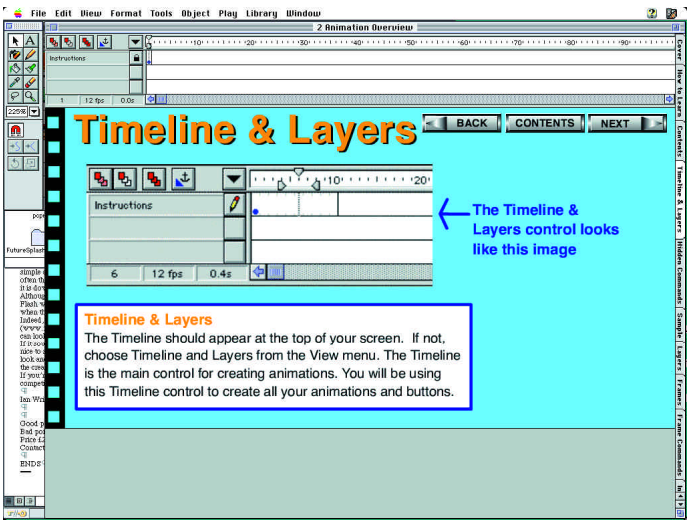
Flash is designed to produce animations and interactive interfaces for web sites. But unlike many of its competitors, it is actually easy to use and the files it produces are remarkably small. Better still, the plug-in required to view Flash animations is less than 100Kb in size, so even the most churlish of web surfers shouldn't object too much to downloading it.

The program comes on a single CD-ROM which works on Mac, Windows 95 and Windows NT. The free Netscape Navigator /Internet Explorer plug-in works on Windows 3.1 machines but the authoring software doesn't. The standard installation includes the program and a set of interactive lessons, available at any time from the menu bar: a good idea, and one that's well executed; you can actually try out ideas from within the lesson as you work through a particular tutorial.



Left A full drawing package is included so you don't need a separate illustration package

Below, left Flash includes a comprehensive set of well produced, useful, on-line lessons



Creating an animation is relatively easy. The program's drawing tools are good, and although some work slightly differently to those with which you might be familiar, it doesn't take long to get the hang of them. Everything is a vector object in Flash, so it's editable at any time. Even when the finished piece is being played via your web browser, you can zoom in and out of the picture without any loss of resolution.

Flash has plenty of options to make life easy for an animator. It will interpolate (or "tween") between keyframes, and objects can be set to move along a user-defined path. It also supports "onion skinning" several frames, showing a fainter version of the previous and next few frames, so you can see where the object was and where it is going to be in your animation. Many people are already creating simple animations using animated GIFs but Flash is a good alternative to those: often the Flash animation is smaller in size and, because it "streams", it starts playing as it is downloading rather than the viewer having to wait for the whole thing to appear.

Although the basic animation is good, it is probably in the area of interfaces where Flash will be most used. It's very easy to produce things like pop-up boxes when the cursor passes over a given object, or buttons that highlight in sequence. Microsoft has already standardised on Flash for its MSN home pages at www.msn.com, and plenty of others are doing likewise. Flash-enabled home pages can look really good and the program makes creating them a matter of minutes.

If it sounds as though I am going over the top about this program, well, maybe I am. But it's nice to see a really great plug-in technology that could have a significant effect on the look and feel of the web, while remaining small and fast to download. The fact that the creation software is relatively easy to use only adds to its appeal. If you're creating web sites, you need a copy of Flash. And get one soon — your competitors will.

Ian Wrigley

PCW Details

Price £269.07 (£229 ex VAT)
Contact Macromedia 0181 358 5857
System Requirements Win95 or Windows NT.
Good Points Small player. Produces small animations. Easy to use.
Bad Points Hard to think of any.
Conclusion Great plug-in technology that could have a significant effect on the look and feel of the web.
★★★★★

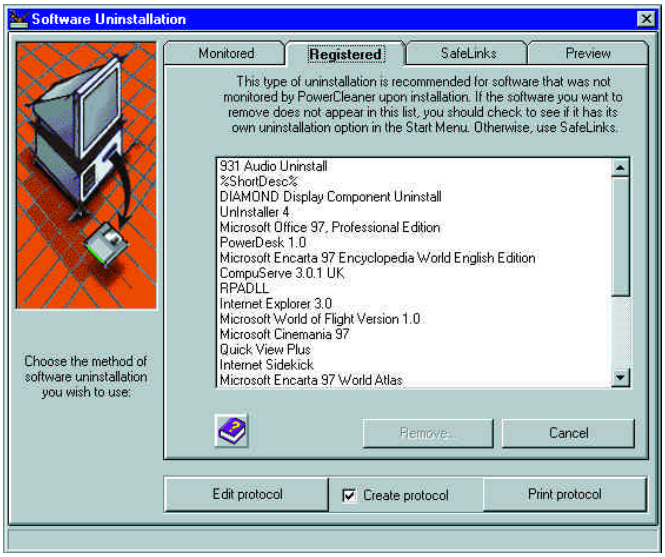
p95 ➢

Software

Three new uninstallers...

...to sweep clean with: Uninstaller 4.0, Cleansweep 3.0, PowerCleaner uninstallers compared.

A new feature in **Cleansweep 3.0**, Update-It, lets internet users access the Quarterdeck web site and download updates to the application Knowledge Base (and CleanSweep itself). An improved Install Monitor handles system changes as they occur.



CleanSweep employs a colour-coded system to guard against accidental deletion and insists on creating a backup. It performs all the usual move, archive and transport tasks. My only criticism is that once an application has been uninstalled, the uninstallation routine must be restarted to delete another application: irritating if you want to eliminate four or more applications or demos you'd downloaded from the net or taken from a magazine's cover CD.

Some uninstallers don't gather sufficient file location information, and uninstallation can be incomplete. But **PowerCleaner** goes through all the files on your hard disk at installation time checking their associations and is thus very efficient. Other than this, it is a fairly basic uninstaller. It will preview changes before they are made, so you have a chance to correct mistakes and it will undo them if any slip through. It has the usual optimisation tools: finding duplicate files, unused files, and adding or removing Win95 Files and Accessories.

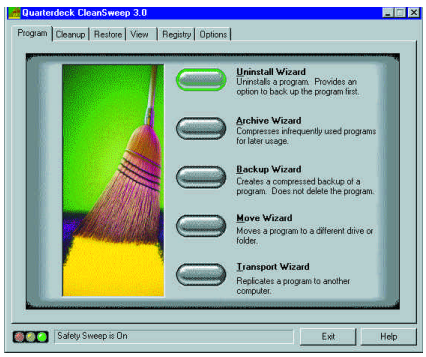
Currently, PowerCleaner seems to be the most efficient uninstaller and is fairly versatile for hard-disk optimisation. Well worth considering.

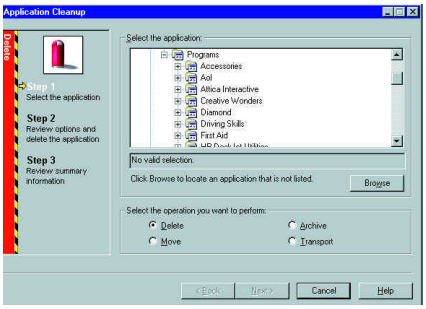
Uninstaller 4.0 uses SmartLinks to scan your existing system configuration and identify the relationships of files, scanning the system three times faster than previous versions. A new automatic Installation Monitor generates a report so you can see exactly what changes were made, and where. Other new features include Group Delete, which lets you delete all the programs in a folder, and Self-extracting Transports, which allows applications transported as zip files to another PC to be extracted by double-clicking on the transported applications. There's a useful Backup Reminder which alerts you to old backups so you can delete them, and there is a new Undo facility which lets you restore an application at the end of an action. It has all the usual disk management features.

■ Overall, these products have different strengths yet all match one another. In the end, it comes down to personal preference.

Paul Begg

Above PowerCleaner: Choose from registered software or monitored installations
Below Cleansweep's smart opening screen
Bottom Uninstaller 4.0 categorises all the files on your hard disk by type





PCW Details

Cleansweep 3.0
Price £39.99 (£34.03 ex VAT)
Contact Quarterdeck Corporation 0645 123521
System Requirements Win95, Windows NT.
Good Points Fast. Easy to use. Internet updates. Version 2.0 included for Windows 3x users.
Bad Points The deleting process has to be restarted from scratch.
Conclusion A good choice.
★★★★

PowerCleaner
Price £24.95 (£21.23 ex VAT)
Contact DataBecker 01420 22707
System Requirements Windows 95.
Good Points Excellent file cleaning.
Bad Points Interface not as slick as the others.
Conclusion Well worth looking at, especially if price is a consideration.
★★★★

Uninstaller 4.0
Price £39.99 (£34.03 ex VAT)
Contact Roderick Manhattan Group 0181 875 4444
System Requirements Win95 or Windows NT.
Good Points Plenty of safety measures. Great automatic Installation Monitor and Report Generator.
Bad Points Perhaps rather slower than its competitors, but nevertheless quick to use.
Conclusion Uninstaller does an acceptable job and does it neatly and safely.
★★★★

p97 ➢

Software

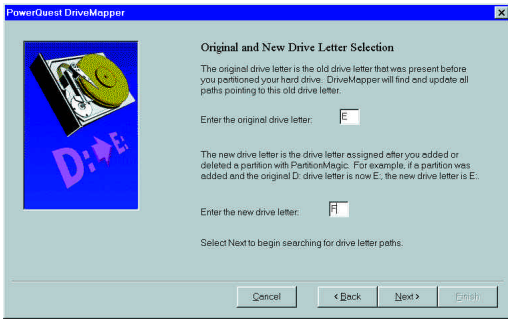
PowerQuest PartitionMagic 3.0

No sweat: Give your hard drive a work-out using this stable partitioning software.

Ironically, hard-drive utilities are often as likely to destroy your hard drive as they are to save it. But there are great advantages to partitioning. You can run different operating systems on your PC, or keep all your data in a 100Mb partition so you can backup to your zip drive with ease.

The benefit to a decent-sized drive is smaller partitions and smaller clusters. Essentially, the benefit of smaller clusters is that they make more space available; up to 40 percent more on an unpartitioned 1-2Gb FAT drive, according to PowerQuest, but the increase is markedly lower on non-FAT drives. PartitionMagic includes a comprehensive guide, which is essential if you're a newcomer to partitioning. Once you've read this, the software is remarkably easy to use and despite several hours of creating, resizing, moving and deleting partitions of all shapes and sizes, together with installing multiple operating systems, it performed well and didn't fall over once.

UnInstaller Mover is included, which offers to clean up your files and attempts to simplify moving installed software from one partition to another. There is also



DriveMapper automatically updates references to changed drive names

DriveMapper, which tries to update references to drive names that have been altered. IBM Boot Manager and PQ Boot are included to help you to manage multiple operating systems on your PC.

Adam Evans

POW Details

Price £70.44 (£59.95 ex VAT)
Contact POW! Distribution 01202 716726
System Requirements Windows 95, Windows 3.1, DOS 5.0 (or later) or OS/2 2.1 (or later).
Good Points Simple to use. Reassuringly stable.
Bad Points None really, but there's always a risk when you mess about with your hard drive.
Conclusion If you want to partition your hard drive, this is a great piece of software with which to do it.
★★★★

Asymetrix WebPublisher 1.0

Choose your options and create your own good-looking web pages without using HTML.

Many internet access providers offer free disk space for subscribers to put up their own web pages. But creating visually stunning web pages isn't easy because HTML code is more like the archaic computer languages of a decade or two ago than the slick visual programming tools you would expect nowadays: no wonder professional web-page designers can charge between £300-£600 a day! For this reason, a number of tools are available for creating your own web pages without having to delve into the intricacies of HTML. Among the latest of these is WebPublisher.

WebPublisher uses a questionnaire-type interface: choose from various options and complete the relevant boxes. In this way, you can design your web pages in six easy steps and, provided you have prepared your images and text beforehand, you could finish six pages in half an hour or so.

The program is on a CD containing different sets of theme templates, including header designs, banners, buttons and so on, with Java-powered graphic elements and buttons that highlight when you wave the mouse over them. There are 20 *sets* — not 20 individual templates — each containing different layout options. Having completed your pages, the application

Design your web pages easily by selecting options from the preset templates

converts them to HTML and transfers them to your net provider's site or web server.

WebPublisher is simple to use and the clip-art is of high quality. Asymetrix plans to release add-ons with more design themes, and tools for audio and video.

Panicos Georghiades and Gabriel Jacobs

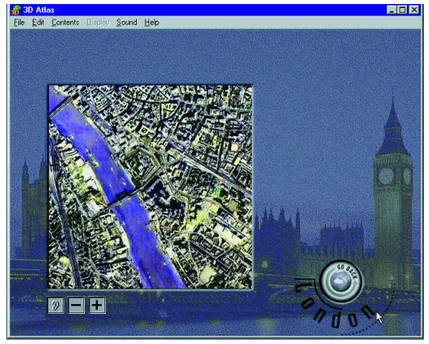
POW Details

Price £69.33 (£59 ex VAT)
Contact Asymetrix on 01923 208425
System Requirements Windows 95 or NT 3.51.
Good Points Cheap. Easy to use. Fast. Results have visual impact.
Bad Points Design limitations: it won't do everything.
Conclusion Good value for a small business or an individual.
★★★

Atlas round-up

Small world, innit? No, not really: there's a whole world of learning and information in these CDs.

Atlases on CD-ROM are better than their paper-based equivalents. Not only do you get a good selection of maps, a gazetteer and lots of geographical and demographic information, but you can also hear native languages and national music, watch videos, and access more colour pictures than would be economical for a publisher to include in a book. There are many atlases to choose from, and each has its strengths and weaknesses. Prices also vary, ranging from about £10 to nearly £60.



3D Atlas: Cities from space — in this case London, taken from a Russian spy satellite

3D Atlas

This is not so much an atlas as a computerised globe. Three Main Globes present environmental, physical and political views of earth and nine Other Globes each focus on a physical characteristic.

The Environmental Globe uses thousands of satellite photographs to show the earth as it appears from space. The Physical Globe looks at topography and the Political Globe displays international borders. Among the Other Globes, the Biosphere Globe shows changes in vegetation, and Continental Drift Globe displays the movement of the continents over 600 million years.

There are several Interactive Exhibits, among them a collection of satellite images of Bombay, London, Moscow, New York, San Francisco and Tokyo. Eleven environmental issues are studied in the Stories section and Time-lapse demonstrates the progressive effects of natural and human-induced phenomena over time.

Map Pins let you add text and photographs, there are two ways of measuring distances, and there's a host of statistics in eight categories: Agricultural, Economic, Energy, Environmental, Global, People, Physical, and Transportation. There is a trivia challenge game called Around the World and a selection of projects called "20 Really Cool Things To Do".

Attica Interactive World Atlas

Click on the opening map screen to zoom in on the country that interests you. The best feature is the Suitcase, a storage area for add-on modules. These have to be dragged from the Suitcase to the menu bar before they can be activated. The Atlas contains three modules with additional ones on the way. The three modules include The World (spinning globes with statistical information like infant mortality or food consumed per person around the world) while Data has a glossary of geographical terms, a list of abbreviations, information about international organisations and a tool to calculate distance between places.

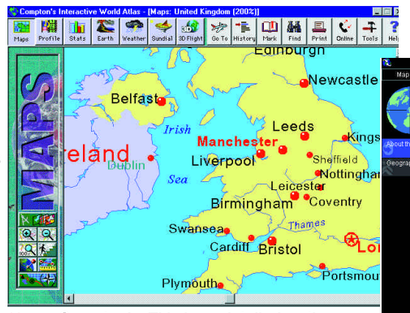
You can access multimedia: there are loads of photographs, most of impressive quality and covering various aspects of a country. A collection of UK photos include a Metropolitan Policeman and a traditional British pub, along with the more orthodox places of interest and beauty spots.

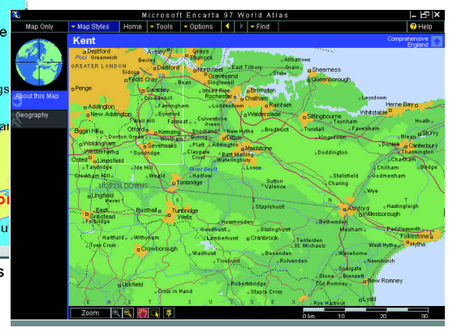
Compton's Interactive World Atlas

As the obvious competitor to Encarta, Compton's Interactive Encyclopedia at first glance looked disappointing. The maps are lacklustre and the CD itself is unexciting to use. First looks can be deceptive, though, because Compton's is actually jam-packed. The information ranges from geopolitical data to statistics like birth and mortality rates, and GNP. Another section lists cultural information, plays national anthems and other music and provides a library of educational videos.

There are three types of map: political, showing the borders of each country; elevation, displaying the topography; and satellite maps, showing the earth from space. Most information is in the Profile section and is divided into categories and subcategories. The categories are Cultural Snapshot, Pictures, Movies, Music, Language and Olympic Facts. Statistical data covers everything from average household size to daily newspaper circulation.

Other sections look at natural phenomenon around the globe, some of the more common global weather systems, and time zones. There are plenty of pictures, good videos and animations. The 3D flight section lets you fly over a 3D-rendered representation of the Alps, the Rockies, the deserts of Australia — wherever you like!





Above Compton's: This is as detailed as the maps get Right Encarta looks good: its maps are very detailed and magnification is excellent

Encarta 97 World Atlas World English

Microsoft states that World Atlas is the most comprehensive atlas ever published, be it on paper or CD-ROM, and there seems no good reason to dispute the claim. There is certainly no question but that it is the best CD-ROM atlas you can buy. The maps are good and the magnification is excellent — at its highest resolution the map features over one million place names, more than any other published atlas. The maps excellently render hues of green and brown "earth tones" to illustrate elevation — dark green represents areas below sea level, paler greens denote the lowlands.

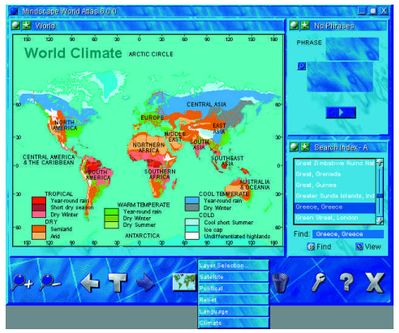
There is a selection of map styles. The comprehensive map of the earth includes the items common to any topographic map: watercourses and water bodies, shaded contours, and elevations and depths measured with respect to sea level. The political map shows the political divisions, the physical map is divided into tectonic and natural features, the satellite map shows the earth by day and by night. The natural map displays eco regions, temperature and precipitation, and the human map depicts population and time zones.

Having chosen a country, you have a choice of articles including culture (articles about the people — their population, language, religion, greetings and gestures), lifestyle (family, diet and eating, social life, recreation, holidays and celebrations, commerce) and society (government, economy, transport and communication, education, health and welfare).

Altogether there are over 1.5 million words of text, more than 2,900 images, 350 world music selections and over 3,000 pronunciations. And, of course, it has been specially designed for the UK market.

Small Blue Planet — Real Picture World Atlas (v3.0.2)

Real Picture World Atlas has been around for a while but is updated to take account of recent changes such as the new nations which have emerged out of the old USSR. It is a nice atlas offering various map views — political, relief and the recently added Hammond, none of which are very detailed. There's an Antarctica political map, a globe charting time changes, and a globe looking at earth from space. In the satellite gallery are photos of the earth taken by satellites and NASA aircraft.



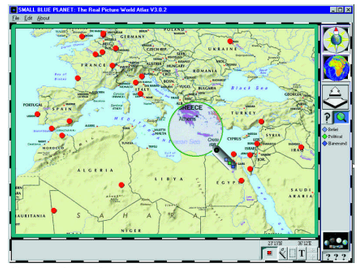
Mindscape World Atlas: It looks great and the maps are strikingly colourful

The core of this CD is a good gazetteer that is blindingly fast. Click on the map and the information in a text box changes instantaneously to the appropriate country, and there is a selection of phrases which you can hear in over 100 languages. The almanac is full of useful data, although it hasn't been anglicised and some information, like the GNP, is given in US dollars: a big minus. As is the price. Given the quality of Encarta for the same money, this title needs to drop in price by at least £10.

World Atlas and Almanac 6.0

There are several types of map on World Atlas and Almanac 6.0: satellite, political, relief, language and climate. They are colourful and do the job, but they are let down by the poor magnification. Shame: the maps are what distinguishes an atlas from a gazetteer.

The almanac contains an enormous quantity of information, though not all of it is that easy to find. The detailed text includes land area, natural resources and endangered species, plus information about the people, education, health, economy, crime, government, agriculture, communication, energy, diplomacy/defence, travel, and history. Pretty comprehensive coverage!



Small Blue Planet: A nice program, with a blindingly fast gazetteer, but a little overpriced

There are some useful tools, including a time and distance option which lets you specify two locations, then calculates the distance. A time and date button allows you to calculate the time anywhere in the world, and you can see the flag of a country and hear phrases spoken in the native language. A nice touch is the built-in notepad which lets you attach your own thoughts, ideas and memos to a specific map. There are pictures too, many of excellent quality, and videos of many cities.

Paul Begg

PCW Details

3D Atlas
Price £39.99 (£34.03 ex VAT)
Contact Electronic Arts 01753 549442
System Requirements Win 3x or Win 95.
Good Points Lots of information, interesting and fun to use.
Bad Points No detailed country maps and not up to date.
Conclusion A good educational tool for the study of the earth as a whole.
★★★

Attica Interactive World Atlas
Price £29.99 (£25.52 ex VAT)
Contact Attica 01865 791346
System Requirements Win 3x or Win 95.
Good Points A nice interface, reasonably detailed maps, and the add-on module idea gives scope for many uses.
Bad Points Nothing immediately springs to mind.
Conclusion A good-quality atlas.
★★★★

Compton's Interactive World Atlas
Price £39.99 (£34.03 ex VAT)
Contact The Learning Company 0181 789 5626
System Requirements Win 3x, Win 95, Win NT Workstation 4.0.
Good Points Packed with information.
Bad Points Poor maps and unexciting to use. Slight US bias.
Conclusion Could be better.
★★★

Encarta 97 World Atlas World English Edition
Price £49.99 (£42.54 ex VAT)
Contact Microsoft 0345 002000
System Requirements Windows 95.
Good Points Excellent maps, with superb detail.
Bad Points Windows 95 only.
Conclusion The best atlas you can buy, on paper or on CD-ROM.
★★★★★

Small Blue Planet — Real Picture World Atlas (v. 3.0.2)
Price £39.99 (£34.03 ex VAT)
Contact BTL 01274 841320
System Requirements Win 3x or Win 95.
Good Points Fast. Good selection of maps.
Bad Points American, expensive, and the maps could be more detailed.
Conclusion Good as a budget CD-ROM, but for an extra tenner you can have Encarta.
★★★

World Atlas and Almanac 6.0
Price £59.99 (£51.05 ex VAT)
Contact Mindscape 01444 246333
System Requirements Win 3x or Win 95.
Good Points Lots of information.
Bad Points The most expensive atlas reviewed here. Poor maps.
Conclusion A great gazetteer, but a poor atlas.
★★★

p100 ➢

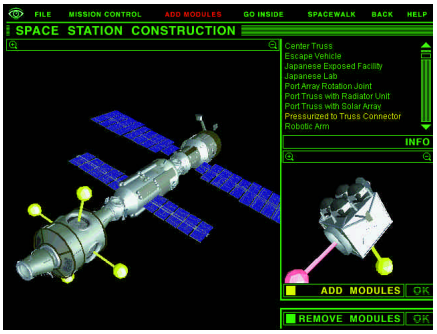
Space Station Simulator 10

What do you do if you see a space man? Park in it man! This CD is one giant step for DIY.

Construction of the International Space Station starts this year and it is due to be inhabited from mid-1998. Space Station Simulator lets you get one giant step ahead by creating a spacestation of your own, made from the components that will be used for the actual station. It is one of the first CD-ROMs to be written specifically for the Pentium MMX.

Designing the station involves sticking together modules into whatever formation you fancy — it's a bit like Lego but not as easy to use. There are detailed 3D graphics of all components which can be magnified and rotated with impressive smoothness. Despite being enhanced for the Pentium MMX, the movement of large assembled stations is jerky and the interior view is similarly afflicted. There is a series of locations with full 360-degree near-photorealistic views that are hotspotted to provide information when you click on them.

It's too easy to get disorientated when



The big yellow nodules show you where to stick your modules

you're moving around this CD. It may be a good reflection of the difficulties of space travel but it's annoying in software. With the green-on-black text, it means a lot of the information is hard to get at and to read.

Maris has included links to related web sites which are full of detailed information on the International Space Station. Once the thrill of building a station had worn off, the web-based information proved to be more interesting. Space Station Simulator is being bundled with new MMX PCs, with the retail version coming out on 1st May. Maris says this will feature more technical information and a user-friendly interface. Unless the content is improved, you'd be better off putting the money towards a holiday in the 64-room hotel a Japanese company plans to have in space by 2020.

Adam Evans

PCW Details

Price £34.99 (£29.78 ex VAT)
Contact Maris Multimedia 01932 781108
System Requirements Windows 95.
Good Points Some impressive graphics.
Bad Points A frustrating interface and poor use of sound.
Conclusion Worth a look if you're really fascinated by the International Space Station and don't have a web connection.
★★

The Genius of Edison

A guide to the life and work of Thomas Edison, in the style of his era and related happenings.

The Genius of Edison is part of Compton's Home Library series and is a comprehensive guide to the American inventor, Thomas Edison. The design mimics the typography of Edison's era and follows the theme through by using lots of sepia tints, old black-and-white photos and silent-movie footage. While a lot of video has been used, the makers have also incorporated animated photos and drawings *à la* Monty Python, injecting a bit of fun into the CD and making it enjoyable to use.

Edison seems to have been responsible for an enormous number of successful inventions, so it's heartening to discover that he also came up with a few real turkeys, such as his talking doll. Inside each doll Edison placed a phonograph, and marketed the toy as the Buzz Lightyear of Christmas 1890. Unfortunately he didn't invent bubble wrap, and 99 percent of the phonographs

The phonograph, Edison's most famous invention, made modern stereos possible

broke during transportation.

In order to make his inventions work and to earn wads of cash, Edison also had to come up with all the associated bits and pieces we take for granted. If you want to sell the idea of electric lighting you'll have to produce power stations, wiring, fuses, switches and, of course, meter boxes.

What makes this title work is the way it places Edison's life and works within an historical and social context. A nifty Timeline charts the life and times of the man and his family along the bottom of the screen, while charting what was happening in the world across the top. This includes events like the discovery of penicillin, the invention of the telephone, the publication of *The Wizard of Oz*, and World War One.

Lynley Oram

PCW Details

Price £29.99 (£25.52 ex VAT)
Contact The Learning Company 0181 246 4000
System Requirements Win 95, 3.1 or Macintosh.
Good Points Great layout. Jam-packed with facts. Puts Edison's work in the context of his era.
Bad Points The music — saloon-bar piano.
Conclusion A nice way to explore history
★★★★

Software

The Simpsons Cartoon Studio

Doh! Don't be an "under-achiever and proud of it". Get cartooning with Homer, Marge & Co.

Calling all Simpsons fanatics. Have you seen every episode one hundred times over? If so, throw away those worn-out videos and forget Sky TV — make your own cartoon instead. The Simpsons Cartoon Studio brings all the magic of Springfield directly to your computer. The aim of the package is to create cartoon strips involving the characters from the popular series.

The concept is simple. Pick a background from a range of scenes like the kitchen or the living room, and add some props such as a table or the famous Simpsons sofa. Then choose the characters you would like to star in your cartoon: perhaps Homer or Principal Skinner? Put the special effects and sounds with it and Bob's your uncle! Or maybe not.

Okay, I said the concept was simple, but when you get down to it, it's a bit baffling. I started off by following the instructions in the manual which gives you a step-by-step guide to creating a standard cartoon. That was fine, except my finished product didn't turn out like the manual had promised it would. I eventually gave up on the instructions and began fiddling about with it myself. And, I must say, some of my cartoons were quite good, even if they did last all of five seconds.

Above
Mr Burns pays Lisa a flying visit

Left
The editing control panel is confusing

You certainly need a knack for this package. If you want to produce a good cartoon, you just have to stick with it and keep trying, over and over again.

There is little variation in the way you work: there's the drawing board in front of you and you can add and delete as you want. I found myself adding things I didn't want and not knowing how to get rid of them, or deleting things I *did* want and then not being able to get them back. The "Editing Control Panel" was responsible for this, consisting of six pictures of filmstrip in different "poses". One hand pulling it from the left side, one hand pulling it from the right, two hands pulling both sides … It all became terribly confusing, as you can imagine.

I loved the sound effects. Being able to make Homer recite lines about waffles and doughnuts all day was fabulous, and Apu's "Thank you come again" was a favourite.

I'd sum up the package as a "stick at it and it will come to you" type of thing. You need patience to explore the possibilities for creating different cartoons.

I would recommend Cartoon Studio to anybody who likes the Simpsons or thinks they can do it that little bit better than the animator, Matt Groening. The package is suitable for kids and adults alike. Bearing in mind it really is hard stuff, I wouldn't recommend it to the under-16s.

Etelka Clark

PCW Details

Price £34.99 (£29.77 ex VAT)
Contact Fox Interactive 01753 549442
System Requirements Windows 95, 3.1, 3.11 and Macintosh
Good Points The feeling that comes with creating your own cartoon.
Bad Points The time it takes to do it.
Conclusion Come on! It *is* the Simpsons.
★★★

Software

Animals of Farthing Wood

With videos and kids' favourite fauna from Farthing Wood, this adventure is a treat for all.

This new CD features the animated characters from the BBC's TV series. It pits children and their favourite animal characters against natural and man-made disasters in a race for survival.

The object is to help the animals of Farthing Wood reach the safety of White Deer Park and escape the bulldozers and drought which have ruined their homes. Along the way, they must overcome obstacles like roads and rivers and pass through various natural habitats.

To help the animals find their way, children must gather information from natural history video footage, picture clues and audio hints, and accept help from the animals themselves. When the child misses a clue or follows the wrong track, the program suggests how to retrace their steps. I found that children as young as five managed the easy-level adventure despite a recommended age range of seven to 11. The motivation for playing the game comes down to using familiar skills. What child could say no to building a log bridge over a river or finding food for a starving animal?

Children can help their favourite characters to overcome obstacles and reach safety

Debbie Davies

PCW Details

Price £29.99 (£25.52 ex VAT)
Contact BBC Multimedia 0181 576 2112
System Requirements Win3.1 or Win95
Good Points A program to satisfy parents as well as children.
Bad Points Best viewed in 16-bit colour.
Conclusion Like AA Milne's *Poohsticks*, make sure this is in your collection.
★★★★★

Kingfisher Learning Explorer

An encyclopedia for kids who *want* to do their homework — it won't inspire those who don't!

This reference CD is designed for children aged 7 to 12 to use as a homework aid, yet it doesn't set out to excite and encourage them to learn; rather, it assumes prior motivation. But it has been well constructed, with good graphics and whizz-bang type noises.

Children start in Zak's bedroom where they click on their chosen topic, each with a list of categorised subjects.

There are a number of ways to navigate around this CD. While studying a subject, children can pull up a list of related articles or look in the dictionary/thesaurus where each entry has hyperlinks to others, so they may find themselves exploring subjects not previously studied. Although the musical pieces in this CD sound like they were recorded using the keypad of a touch-tone phone, the title has many nifty features. The most useful is that it can be linked to a word-processing application, so text or pictures can be downloaded into a homework document. Presumably, the publishers of this CD have assumed close supervision of kids by their parents to avoid inadvertent plagiarism, even though the information included is very basic.

Zak's bedroom may be a mess, but the subjects and topics are tidily organised

Lynley Oram

PCW Details

Price £39.99 (£34.03 ex VAT)
Contact Liris Interactive 0171 306 1100
System Requirements Win3.1 and Win95
Good Points Great for helping kids with their homework.
Bad Points Poor music quality. Could use more video clips.
Conclusion Not a patch on the old-fashioned paper encyclopedias when it comes to detail, but nevertheless quite useful.
★★★

p104 ➢

Software

Cyberpest

Billed as “the critter in your computer”, your pest needs food, water and (excessive) discipline.

This is similar to other CDs which provide a pet on your desktop for you to care for and play with, except that this features a *pest*, designed to annoy you. However, the pest is endearing and didn’t annoy me enough for me to want to punish it. It inhabits a room with playthings in it and likes to bury things, so place your ornaments on the top shelf.

Help is at hand for the pest’s mental and physical development. Its personality depends on the hour of its birth (i.e. when you first load the CD). Mine was born at 3pm and was moody, anxious, and prone to biting and hiding. But help comes in the form of advisers like a Pest Vet and a Pesterminator. The vet helps with problems ranging from fleas to constipation. The Therapest advises you what to do about depression, anxiety or introversion (in the pest, not you). If it gets manic, you’re advised to give it electric shock treatment. In extreme cases, the Pesterminator tells you to give it too much food so it explodes. Not at all pleasant.

There are many ways to punish your pest, from the sublime to the ridiculous

The sound effects are good and the sense of humour is strong but a bit sick.

This CD is for adults and kids, but children will either quickly tire of it or grow up with a distorted view of right and wrong.

Rachel Spooner

PCW Details

Price £14.99 (£12.75 ex VAT)
Contact Koch 01256 707767
System Requirements Win3.1 or Win95
Good Points An amusing way to spend breaks between work.
Bad Points Sick.
Conclusion Good value if you like this kind of thing.
★★★

Five on a Treasure Island

When it’s raining and the children don’t want to play outside, this could be a spiffing wheeze.

Most of us are familiar with The Famous Five, a bunch of boys and girls aged between 10 and 12 years old who are allowed to roam the countryside on their own and have adventures, with never a responsible adult in sight. You wonder why on earth their parents haven’t been arrested in a blaze of “home alone” tabloid publicity.

The CD is crammed full of jolly things to do and has features that enable it to be used as a teaching aid. Actress Susannah York narrates the book, but children can read it themselves. The text size can be enlarged and you can make notes as you read the story.

It is beautifully illustrated with lots of fifties-style drawings and clips from the TV series, and it’s all jolly good fun. To really involve the kids in the story, there are lashings of games and quizzes. These vary from crosswords to story-writing, and even include a role-playing game. Hurrah!

Some of the activities, like the ones that aim to teach literacy skills, may smack too much of homework to really hold a child’s attention. Paradoxically, although it aims to teach subjects like literacy skills, the title is full of author Enid Blyton’s grammatical howlers, such as thanking kids for “adventuring with us”.

This is the first of many CDs planned for release by Systems Integrated Research, a British software company. Two further titles are due for release soon.

Lynley Oram

Yo, ho, ho! and a barrel of fifties-style fun on Treasure Island with Dick, Julian and the rest

PCW Details

Price £29.99 (£25.52 ex VAT)
Contact SiR 01773 820011
System Requirements Windows 3.1, 3.11 or 95
Good Points Lots to do. Good value for money.
Bad Points Some of the activities could be a bit more exciting.
Conclusion Isn’t it a tad cruel to set kids up with a PC in their bedroom and then feed them CDs about how much freedom children used to have?
★★★★

Long Term Tests

Software

1 YEAR TEST

PFS Publisher 1.1

Desktop publishing at a bargain price for those short of cash or power on their PCs.

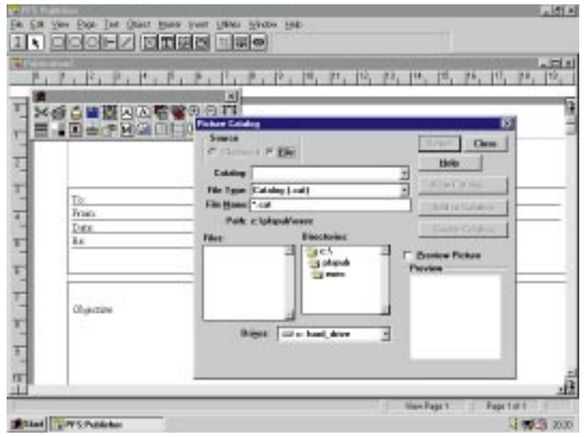
This version of PFS Publisher is for Windows 3.1 or later. I have used it with Windows 3.1 and Windows 95 and it doesn't really change except that it refuses to accept long file names in Win 3.1. Publisher is supplied on three 3.5in floppies and has lots of excellent clip-art, some tutorial samples, and a small but worthy collection of bitstream TrueType fonts.

On launch you get a small but sensible toolbar. It's not reconfigurable but you can edit the "QuickButton palette", the other toolbar in a small window which handles zoom and cut and floats on your desktop. If you click on the "new text frame" button on the toolbar, you can instantly drag out a frame and begin typing into it. Right-click anywhere in the Publisher window and the toolbar will change to another small but sensible toolbar with drop-down menus for all the font options. However, you do have to go into the menus for items like tabs, spacing and drop caps. There's a spell-checker and thesaurus, as well.

Initially, when typing, I found the word processor a little slow to respond but have adjusted to it over the past year. It will import ASCII, RTF, MS Word, WordStar, AmiPro, WordPerfect, and PFS Works text formats. The word processor also offers some interesting features such as an automatic contents and index page maker.

Another useful feature is the New Window check box in the Open and New dialog boxes: when you have finished with one document, you can un-check this option to automatically close it.

When setting up the page layout for publication you discover a nice feature called Facing Pages which allows you to view the left and right pages of a booklet together. It has a good "master page" feature which allows you to program objects to appear in all pages that you specify. Publisher also has a "Macro Recorder" option in the system.



PFS Publisher 1.1: a simple interface for a simple, yet effective, DTP package

The package comes with a selection of templates and a cataloguing system for these plus any you make yourself. It has its own cataloguing system for graphics files, but unfortunately not all file formats are supported.

Publisher's documentation is excellent on paper but pathetic on screen. Essentially, all the help file lists are the menu commands, which becomes annoying. However, help is available on the status bar when you float your mouse pointer over programmed "hot spots" such as toolbar buttons.

What surprises me particularly about Publisher is its system requirements. It only requires Windows 3.1, DOS 3.1, a 286 processor, mouse, 2Mb RAM, 6.5Mb of hard drive space and EGA graphics. This can only be described as a miracle for non-state-of-the-art machine users.

My major complaint is the Snap To Guides and Snap To Ruler features. When you zoom in to 200 or 400 percent, you find that these features have only *roughly* aligned the frames to the guides or rulers. To get them dead right you have to zoom in to 800 percent, set your mouse to the slowest movement and arrange them manually. What a pain in the neck!

Another annoyance with Publisher is that it insists on having at least one publication open at a time, and when all the publication windows are minimised, the File menu cuts itself down to only two items — Printer Setup and Exit. Strange.

So would I recommend this package? It's very good value for money: if you are short of cash it's a good choice, but only if you aren't fussy.

Thomas Cumming

PCW Details

Price £29.99 (£26 ex VAT)
Contact The Learning Company 0181 246 4000
Good Points Cheap. Easy to use. You can run it on your old 286.
Bad Points Poor "snap to" features. Poor on-screen help.
Conclusion It has served me well. A worthy yet affordable package.
★★★

Software

1 YEAR TEST

MS Works 4.0 for Win95

MS Nanny for Win95, more like. Some nice features, but shame about all the hand-holding.

Works 4.0 is misnamed. It should have been called "Office for Kids". The previous version (3.0) was almost an "Office Lite", and handled most of the tasks needed in a small business. This version is similarly functional but assumes that if you don't need the machismo of "Office Pro", you must either be a novice, or thick.

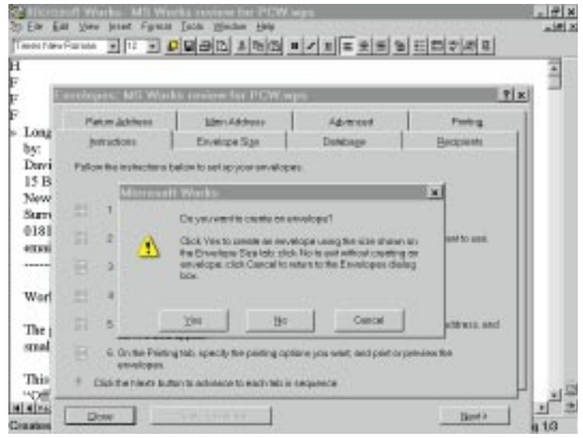
Your hand is held constantly, to the point where it becomes obstructive. The Envelopes function is a prime example. Normally, you write a letter, highlight the address and select "envelope", expecting the envelope size, return address and font to be the default. Not so with Works 4.0. Instead, up pops a dialog with eight tabs and instructions on how to create an envelope. Even after I clicked "envelope" and closed the ensuing dialog box, Works 4.0 still asked if I wanted to create the envelope! Remember when you were 16 years old and your mum still tried to hold your hand crossing the road? Well, that's how I felt when this happened. You can turn off the cue cards and you don't have to use the wizards, but you can't hide the "program for idiots" ethos.

At its core, Works 4.0 is an effective piece of programming. My installation took up just over 20Mb on my hard drive, including the dictionary, thesaurus, and clip-art files, but with care you could prune this to about 15Mb.

The database is merely a sophisticated cardfile and the weakest item in the suite. Form design is straightforward with drag-and-drop labels and fields, but they're flat files and fairly lightweight. I set up a simple database of 1,000 names, addresses and numbers with some date and yes/no fields, and discovered some limitations. The number of queries which can be stored is limited and is made worse by the lack of a macro facility.

Sadly, the database emphasises design and presentation above the more important functionality. It is frustrating to see the duplication of information in a non-relational database.

The spreadsheet is better but it lacks some of the functions of Office 95; most people I know mainly use the simple maths utilities. It's intuitive to operate, with named ranges, auto-sum and auto-format. I like the way I can set up a sheet to track my share-holdings in five minutes flat, but this may say more about my shareholdings than the spreadsheet. It's so easy to use that I will happily knock up a quick-and-dirty one-off sheet to compare different Tessas with all their variations. For charts, just highlight a range and click.



Arghh! Works 4.0 really makes you work hard to print a simple envelope

The comms section is crude but usable and includes Zmodem and scripts.

The star of Works is its word processing utility. You can drag-and-drop sections of database and spreadsheets, insert pictures, drawings, notes and objects, and use WordArt to jazz things up. You can even write with it! The wizards are excellent, requiring little effort or thought to set up letterheads. The important word processing functions like print preview can be placed on the toolbar for quick access.

A new feature is Easy Text. For example, "Yours faithfully", three blank lines and your name can be "easy texted" to typing "yf" and hitting F3. But as I like my name bold and underlined, the Easy Text must be similarly formatted so it would need two sequences of Easy Text. It's quicker to type and format it manually. There is a raft of pre-formatted Easy Text, none of which I want as the function is too inflexible for my needs.

Works 4.0 could easily be improved if Microsoft removed the hand-holding and added macros. I would then regard it as a reasonably-priced word processor with useful spreadsheet and database functions.

David Thorpe

How you can contribute to our Long Term Tests section

We welcome readers' contributions to our Long Term Tests section and pay for any we publish. If you've used a piece of hardware or software for some time, write a 300-word article for hardware, or a 650-word piece for software (with a Gif format screenshot), and send it on disk in MS Word (Mac or PC) or ASCII format to Dylan Armbrust at the usual *PCW* address, marking your envelope "Long Term Test", or email it to dylana@vnu.co.uk.

PCW Details

Price £66 (£56 ex VAT)
Contact Microsoft 0345 002000
Good Points Decent spreadsheet and word processing facilities.
Bad Points Too much hand-holding for my liking.
Conclusion A solid, basic, all-in-one suite that does the job.
★★★

p110 ➢

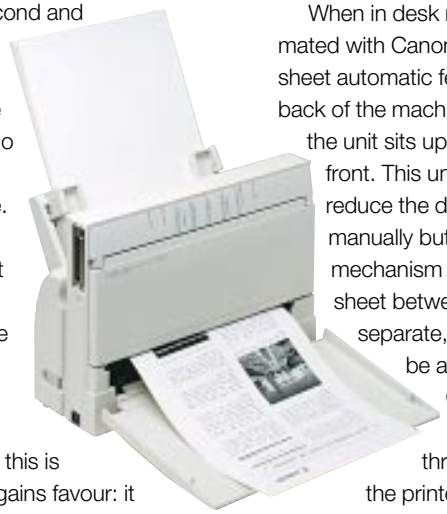
Hardware

3 YEAR TEST

Canon BJ-10sx

Have printer, will travel. This bubblejet may chug along slowly but it is portable and reliable.

By today's standards, the Canon BJ-10sx Bubblejet seems slow and lacking in print quality. In 360dpi mode it can only manage 110 characters per second and it's not that quiet when it's running full bore. But to be fair, three years ago its attributes were not below average.



It weighs just under 2kg (without batteries) and occupies much the same footprint as an issue of *PCW* on the desk. It is quite portable and this is where the Canon gains favour: it seems to be a printer destined to accompany a notebook PC on its travels. The BJ-10sx could be defined as a neat product for a niche market.

When in desk mode, the printer can be mated with Canon's ASF 64200, a 50-sheet automatic feeder which clips onto the back of the machine. However, this means the unit sits upside-down and back-to-front. This ungainly affair is intended to reduce the drudgery of loading paper manually but in practice the complex mechanism required to pass each sheet between the two, fundamentally separate, pieces of equipment can be a bit temperamental. Occasionally they jam, or at other times two or three pages get fed through the printer instead of one.

After nearly three years of flitting between desks 100 miles apart, I have found that the Canon BJ-10sx was an economical and reliable choice. Its pairing with the ASF 64200 may be eccentric, but ultimately the combination makes a successful compromise between portability, quality and speed.

Martin Cooper

PCW Details

Price (Discontinued item)
Contact Canon 0121 680 8062
Good Points Easily portable and cheap to run.
Bad Points Optional sheet feeder is rather temperamental.
Conclusion Reliable and a pleasure to use.
★★★

Hardware

6 MONTH TEST

PC Science Multimedia Pro P133

A solid PC for home or SoHo use which looks good, sounds great and won't break the bank.

We tested the Multimedia Pro for our PC group test in *PCW* August '96. In our lab tests, the machine turned in an average performance for a Pentium 133MHz, with 16Mb RAM and 1.7Gb hard drive. It then underwent a long-term test and was subjected to a six-month pounding. It survived, and has proved to be solid and sturdy.

The PC came with 31 CD-ROMs, a QuickShot joystick, a microphone and speakers. First-time users would appreciate the variety of software.

All multimedia aspects were high quality. With an IBM Sound Miracle 28.8 ISA card, based on an Mwave chipset and enhanced by the Trust speakers, the sound was a delight. CD audio quality from the Aztec eight-speed drive was good and often replaced the hi-fi during long work periods. Modem and internet activities were supported by the Miracle 28.8 card whose functionality and reliability remained stable over the test period.

Solid graphics performance came from a Matrox Millennium card and a 17in Daytek monitor; a pairing which would not have disappointed any gamer or SoHo user.

It is difficult to fault the PC Science. All the components were of a high standard and it maintained respectable performance. The only weak point was the memory: the four slots were all utilised and any upgrade plans would entail a complete SIMM replacement. It coped with nearly every new software package, two operating systems and my favourite legacy DOS shareware.

Jonathan Ricks

PCW Details

Price *Then*: £1,762 (£1,499 ex VAT).
Now (approx): £1,400 (£1,200 ex VAT)
Contact PC Science 01423 323386
Good Points Great graphics. Complete home multimedia bundle. Upgradeable.
Bad Points Full memory banks.
Conclusion Quality components in a solid PC. For the money, you can't really go wrong.
★★★★

PAUL SHORROCK

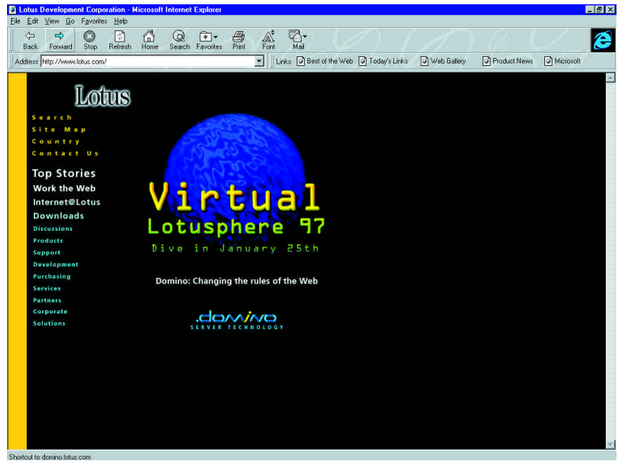
Lotus Domino 4.5

Domino is not so much an upgrade; more a case of marrying Notes to the net. Eleanor Turton-Hill reviews Lotus's bid to knock spots off the groupware market.

Lotus Domino is more than just an upgrade to existing Notes software. It is a response to the fast-moving software market in which "groupware" has undergone a process of radical change. In the past couple of years, the internet has provided businesses with a new, simpler, groupware model: one which allows users to embrace almost any type of information using a single piece of common software, the web browser. Hence the groupware market has shifted drastically, and consequently, Notes has been forced to reposition. With the release of Domino Server 4.5, Lotus hopes to re-establish its hold on the groupware market by uniting the two worlds of Notes and the internet.

Until recently, the one disadvantage of using Notes as a groupware platform was that it required the support of a client on the desktop. The architecture proved expensive, not only because of software costs, but also because of the expertise required for its configuration and support. Many people perceived Notes as complex, expensive, and intimidating.

To alleviate some of these concerns, and to re-position itself as the leading groupware vendor, Lotus has made some bold changes. In this release, the Domino 1.0 web server add-in has been integrated with the Notes 4.x server, making one all-encompassing platform called Domino Server 4.5 powered by Lotus Notes. Effectively, Lotus has combined the strengths of the internet with the superior security, application development and information management features built into Notes.



The Lotus Domino web site is a showcase for the product itself, set up to demonstrate the powerful mix of the internet and Notes

The Domino server translates Domino and other existing Notes databases into web format on the fly. This contrasts with Lotus's previous web solution, InterNotes, which could convert Notes databases into HTML files and make them available to clients via a separate web server. With InterNotes, the conversion process occurred at regularly scheduled intervals so that when a document was changed, or added to, on the Notes database the web document would reflect this change after the next scheduled publishing refresh. In order for this process to function at all, there had to be an InterNotes-enabled Notes server running and connected to the internet.

Domino is a kind of hybrid Notes server. It extends the capabilities of the older InterNotes technology beyond the one-way publishing solution. InterNotes was fine for pushing information out to a web server but useless as a platform for building and deploying applications. Domino does more than just publish documents and fill out forms. It allows users to make use of Notes applications over the net (or intranet) with little or no change to their design.

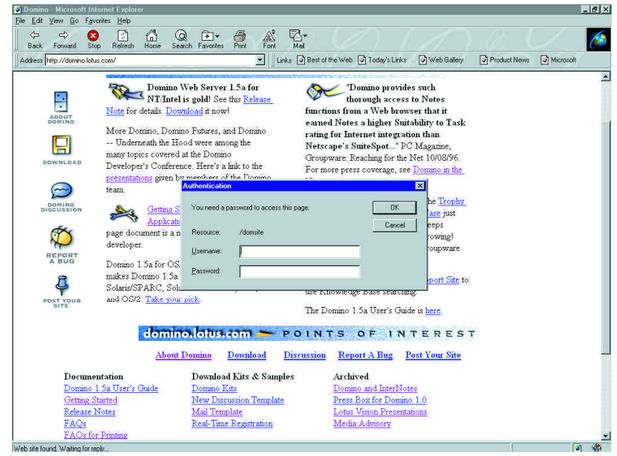
Security

One of the great advantages of Domino is that it provides web access to the many Notes security features. Access to any database can be configured with security restrictions right down to the field level so that any of the existing company workflow applications developed in Notes, which previously required a Notes client, can now be used over the web using an ordinary browser.

Before employing Domino, users must be assigned an HTTP password which is stored in Domino's Name and Address Book (NAB), the central repository for all user-login information. The various security features of access control, authentication and encryption are then implemented, but in a different way to the traditional client/server model. Domino opens up access to a whole world of net-connected browsers and this throws up a load of security implications that did not exist in the old model.

Seasoned Notes administrators will know that in previous versions it was possible to set up anonymous access to a given database. This allowed users to read and write data with no registered authentication, or record, of their access. If you want to protect a database from this kind of public access, the Anonymous parameter in the Access Control List (ACL) can be set to "No Access".

The point is that this step has to be performed explicitly. If the Anonymous parameter is not set, then users are granted all the privileges defined in a database's Default Access. This kind of security issue is not so crucial under the traditional client/server model where access to databases can be carefully configured, but with Domino's web access architecture, data becomes far more vulnerable.



The security features built into Notes are also demonstrated on the Domino web site. Certain areas of the site are protected with user names and passwords

In Domino, security can be defined on two levels. ACL files can be defined for individual databases to limit access to specific users or groups. Your existing ACLs should be thoroughly checked before you install Domino as you may want to change your security policy. Then, when Domino has been installed, the NAB is updated with an HTTP password for each user so that requests to access specific databases can be validated against a given user's name and password. This provides exactly the kind of security with which users are familiar, over the web: simple usernames and passwords sent down the wire in response to access requests.

p117 ➢

Higher-level security can be defined using SSL encryption. This ensures a higher level of protection for all transactions between the client and the server. SSL is now an industry standard supported both by Netscape Navigator and Microsoft Explorer. It provides a high level of confidence that network traffic is not being tampered with and that the appropriate messages are being sent back from the server side.

Client software

The security features built into Domino for web access seem impressive — so much so that it is difficult to justify the existence of the Notes client software. So, how exactly does the client software now fit into Notes' new architecture? The features and capabilities, which have been passed on to the web browser, are now so comprehensive that the traditional client software seems virtually redundant. So why would anyone spend the time and money on a traditional client/server setup?

The first, and probably overriding justification for implementing the traditional architecture (especially for large corporations) is security. With traditional client software, there is still a far finer control over access privileges, controlling security right down to field-level encryption. Second, certain workgroup applications like calendars, scheduling, and accessing mail offer much higher functionality under the client software.

There are many other capabilities that exist in the fully-fledged client software which are beyond the scope of a simple web client; like replication, for instance. If you are a laptop user, often away from the network and disconnected, you will need the Object store and replication functions provided in the client software. With HTTP retrieval now added to the client, you will no longer be required to go through the Notes server for your internet access. You will be able to use Notes' agent technology locally with processes configured to periodically collect information from certain web sites.

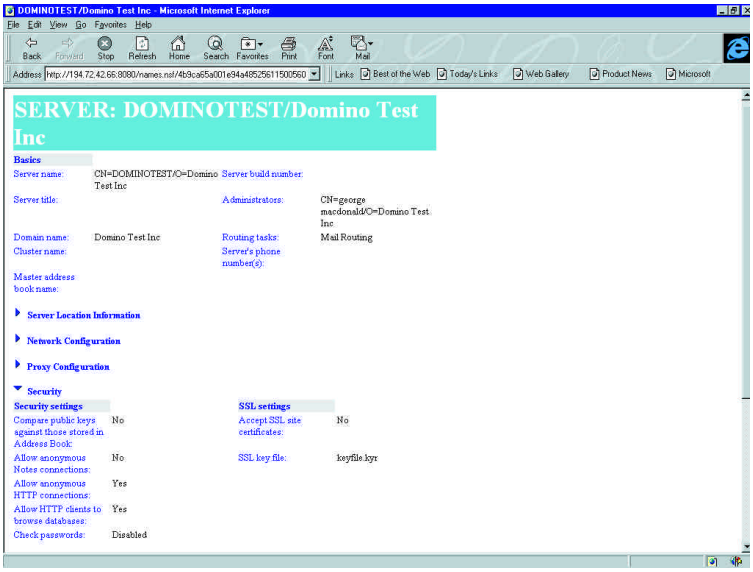
Notes' replication facility is one of its strongest features, placing it in a unique position when compared with another type of groupware. Notes lets you make a copy of your data on a laptop and then, even if you are not connected to a network, you can work on it and update it. When you return to the network and reconnect, Notes will synchronise your changes with the shared copy of the data, resolving any conflicts as it combines the two versions.

There are several other significant web-related improvements to this version of the client software. For example, users will now be able to launch Netscape or Explorer browsers by clicking on a URL in any Notes document. POP3 mail support is also integrated into this version so that mailboxes hosted in Notes can be accessed by any internet POP3 mail client like Eudora, the Windows 95 Inbox, or Lotus ccMail 7.0.

Tools for developers

Notes is now compatible with most major operating systems including OS/2 Warp, Macintosh, various UNIX

p118 ➢



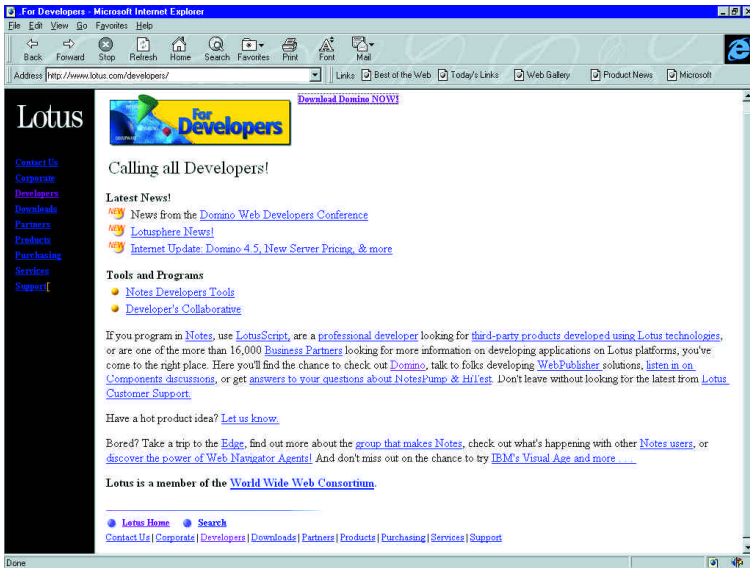
To protect your Notes database from users who are not in the Public Address Book, "No Access" is assigned to the "Anonymous" parameter and this causes Domino to challenge all users who attempt to access the database for their name and password. Here, the security settings to the VNU Labs Notes server are viewed from Microsoft's Internet Explorer

How does Domino work?

Domino works by translating constructs, which are specific to the Notes architecture, into HTML. This translation, which is done in real time, enables Notes databases to be displayed in a web client. So all the elements which make up a Notes application (i.e. text databases, formulas, views and links) become web constructs and ultimately they become dynamic interactive web sites.

As a developer, you need have no knowledge of this translation process because it is completely transparent. All the building blocks, which you use in Notes to create applications such as links or Action buttons, are translated into URLs in the web client. When Domino translates Notes constructs into HTML, it also creates URLs where needed. So as the application designer, you need have no knowledge of the web page creation process.

For example, setting up links with Domino is achieved simply by creating Link Hotspots as you normally would in Notes. URLs are created in the web documents on the fly, and the HTML links created in Domino are much more stable than typical web page links. Because ordinary HTML links are file-based, when a file is renamed or moved, the link is broken. Notes links work differently because they depend on uniquely identifying the object of the link. A document could be reclassified, or moved, and the link will still be maintained. This is a typical example of how Domino combines the best functions of Notes and the internet.



Comprehensive support for developers is provided on the Domino web site, keeping you up to date with the latest news as well as providing discussion forums and general development advice

platforms (including IBM's AIX, Sun Solaris and HP-UX) and Microsoft Windows and Windows NT. A whole range of development tools are provided with Notes for building applications.

The language with which most people will be familiar is LotusScript, an embedded BASIC scripting language which is common to other Lotus applications such as Approach 96, Freelance 96 and Word Pro 96. LotusScript is a simple language which has developed more powerful functions over the past few years. It provides high-level functions for controlling and manipulating objects within Lotus applications.

One of the most significant improvements in Notes 4.5 is its ability to execute Java applets; an important capability for developers and for the computer industry at large. Java is, after all, a fast-growing language with important characteristics like platform independence, security, and the ability to divide processing between clients and servers; attributes which have been important in Notes' development right from the start.

The incorporation of Java applets into Notes applications has a two-fold effect. First, it enhances the dynamic nature of Domino pages and extends functionality on the client side. Second, at the server end Java can be used to implement server-based agents that talk directly to Domino's back-end services. Java classes and applets reside on the server and references are made to them from Domino documents.

Also available to the developer is the Lotus Components suite of business applets designed specifically for Notes. These components are, technically speaking, enhanced ActiveX controls which can be used by developers as building blocks when developing business applications. There are seven applets in all, including a spreadsheet, a charting program, a file viewer and a template builder.

A C++ API is also built into Notes which provides developers with an object-orientated interface and a set of C++ classes which allow application programs to create, manage and access Notes databases. This provides developers with a consistent object model similar to that of the Notes user interface, providing access to Notes-specific functions.

The future for Notes

Lotus Domino is an impressive piece of work and despite any threat posed to the product by the explosive growth of the internet, the fact remains that Notes is a superior tool for implementing complex groupware systems. Unlike the internet, Notes was developed right from the start to be a dedicated groupware tool with a secure shared database structure, integrated email, and a rich development environment which can be used to build your own custom applications.

The web, despite its provision of easy and open access to information, still has a lot of catching up to do before it can provide the kind of facilities which Notes users have taken for granted in the past. The decision point for most businesses will centre on the level of

The intranet

The explosion of the internet had a big effect on Lotus Notes, although not everyone was quick enough to predict it at the beginning. But gradually, as the internet began to be used in business, internet programs migrated onto internal networks, i.e. LANs and WANs using TCP/IP as a network protocol. The invisible network protocols that make the internet work are TCP (Transmission Control Protocol) and IP (Internet Protocol). Although traditionally the preferred internet OS was UNIX, TCP/IP is totally platform-independent and can run any internal network alongside other network protocols. Consequently, the same programs you use on the net can be used on an internal network.

The growth of the internet led to the growth of the "intranet" and hence a whole new flurry of activity in the area of groupware. Users, as well as management in businesses of all sizes, were eager to improve their communication and workflow using the simple browser interface as their client. People found (and still are finding) that this simple architecture provided them with most of the functions they needed to do their jobs: they could instantly get hold of the information they needed and could interact with fellow employees.

One of the most important factors in the development of the intranet was the hardware independence of the browser. In any organisation, a system that is hardware independent provides an ideal infrastructure for connecting all machines together, rather than just isolated groups.

An important point to remember is that a TCP/IP network works the same whether the data resides on an intranet or the internet. If you are running TCP/IP you can access both without making any adjustments to your software.

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Lotus Components

Lotus Components include six core applets: Chart, Comment, Draw/Diagram, File Viewer, Project Scheduler and Spreadsheet, plus the Lotus Component Template Builder to customise the Lotus Components into business objects. These applets are designed to work within the Notes environment and are geared to two distinct groups: users and developers.

For the end-user, these fast applets are intended as tools to speed up common daily tasks which might otherwise involve loading a separate application outside of the Notes environment. With a spreadsheet, word processor, and other general office tools available within Notes, documents can easily be created and attached to Notes documents.

For developers, the Lotus components are provided as programmable ActiveX controls designed to extend the functionality of Notes applications. Each one can be customised to the specific needs of an application and because of the high degree of integration between them, data can easily be passed. As well as providing their own applets, Lotus is also supporting Java and hence the JavaBeans standard which defines a set of component APIs which enable developers to create more powerful cross-platform web applications.

You may well be wondering where this leaves Lotus SmartSuite? The way Lotus sees it, the component applets are cut-down productivity tools. They provide very basic functions which are geared towards their integration with Notes. Each SmartSuite application, by contrast, offers full functionality. The distinction between the two types of application seems clear, yet in practice their roles in day-to-day work are bound to overlap and it remains to be seen how this will affect the suite market.

There is, of course, a large degree of integration between the new components and SmartSuite. The charting tool in the component suite has been derived directly from Freelance Graphics, and Word Pro is now a container for Lotus Components.

complexity they want in their workgroup systems.

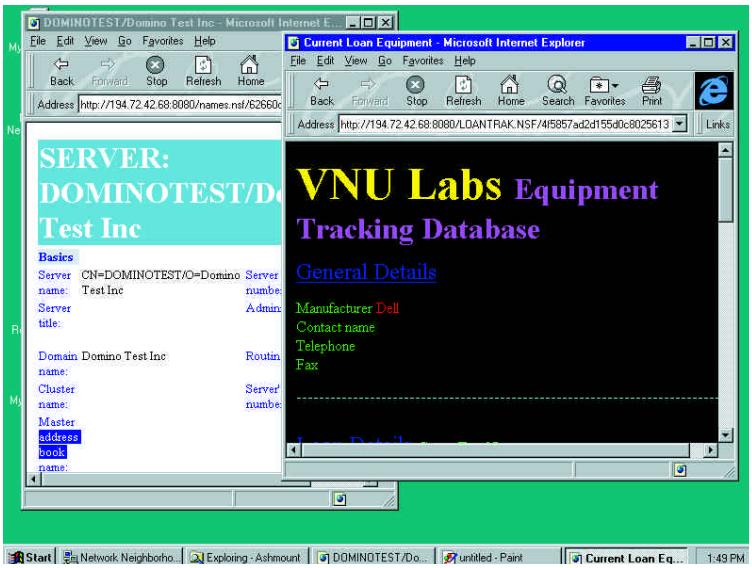
Many intranets are built on the assumption that all you need for a groupware system is a web server, web clients connected via TCP/IP and maybe some CGI programs and security. But over time, the system begins to develop and other tools are required for HTML editing, and for managing links as they become increasingly complex. Then, as the information on the site builds up, the number of users starts to increase and you soon need to implement a proper security system. As time passes and users become more familiar with the system, they start to search the server for specific pieces of data. In other words, demand increases for functions which require application and form design tools, and eventually more complex workflow tools.

It's easy to see how a humble intranet system ends up requiring a similar level of sophistication to that which Lotus has been cultivating in Notes groupware for many years. It is accepted by most industry critics that currently-shipping web technologies aren't as powerful as Notes, but technical complexity does not guarantee success. Notes is faced with a significant challenge if it is to regain its former dominance in the groupware market.

In a way, the future of Notes is outside Lotus or IBM's control. Its success or failure depends on the dynamics of a complex software industry in which trends grow and develop and fads come and go at a furious pace. For most businesses, the crucial step is in their analysis of what kind of groupware they are going to need and how they think their system will grow in the future.

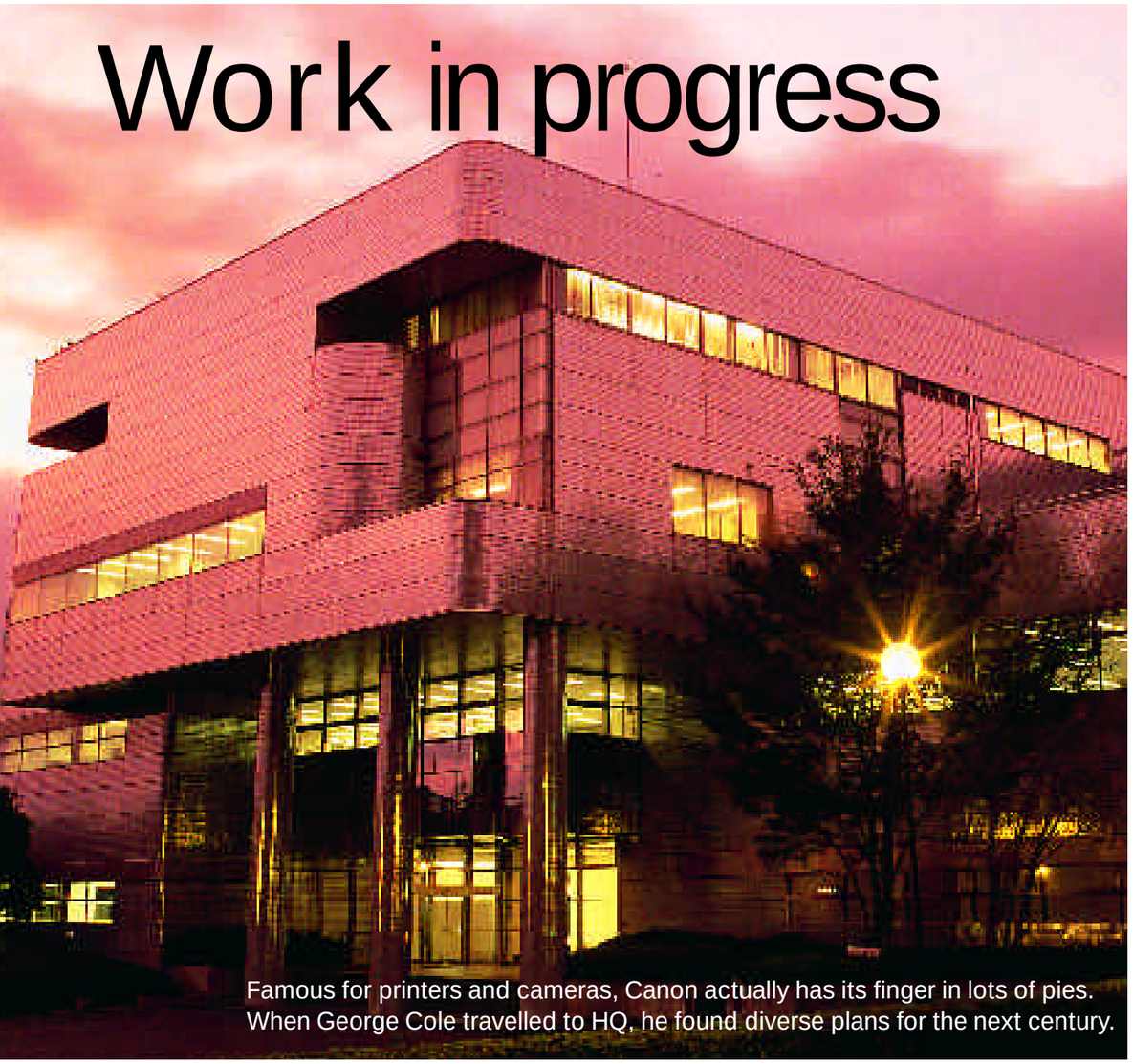
There is no reason, of course, why Notes and the web should be mutually exclusive. The two technologies challenge each other and ultimately the development that takes place will be to the business customer's benefit. The popularity of the web has certainly hastened the pace of Domino's technical development, but this has also had a reverse effect: more complex workflow, email and database application design tools are beginning to appear in rival web technologies. In the end, the overall effect of this technological change will be good for the market: you get more features more quickly, so once again the pace of change drives prices downwards.

Lotus Domino enables current Notes users to extend the reach of their Notes applications to any web client. Here we've linked some of our existing Notes 4.0 databases with Microsoft's Internet Explorer on the client



■ **Domino 4.5** costs £400 (£341 ex VAT) for a single processor version; £1,861 (£1,584 ex VAT) for a multiprocessor version. **Contact** Lotus 01784 445808.

Work in progress



Famous for printers and cameras, Canon actually has its finger in lots of pies. When George Cole travelled to HQ, he found diverse plans for the next century.

Hive of industry: Canon's Research Centre in Kanagawa, Japan

Ask most people what the Japanese company Canon makes and they'll probably say cameras, copiers or bubblejet printers. But there is a lot more to this company than meets the eye. In fact, cameras only account for around eight percent of the company's sales. Copiers and computer peripherals took about two thirds of Canon's £14 billion sales in 1995. The company is also heavily involved in optical products, solar energy, biotechnology and projects that could change the face of personal computing. These include high-density memories, flat-screen displays and high-speed optical networks.

The secret behind the success of many Japanese electronics companies is simple: they invest a lot of money in research and development, keep one eye firmly on the future, and will radically change direction to stay ahead of the game. Canon invests over ten percent of its budget on R&D and, in 1995, filed 1,087 new patents in the US, second only to IBM with 1,383. Canon's president, Fujio Mitarai, says the company is now preparing for a new age: "The backbone industry of the 21st century will be the information industry," he says.

Hiroshi Tanaka, Canon's vice-chairman, takes up the theme: "We're entering a multimedia era in which three industries will dominate: the platform industry, the distribution industry, and the content industry. We need to acquire other technologies if we are to be a leader." Hence the drive to develop new products.

Canon's Research Centre in Kanagawa is a large complex housing 229 researchers. The place is more informal than you might expect from a Japanese workplace. Many of the staff are casually dressed and operate a flexi-time system which lets them choose the hours they work. Workers recline in easy chairs in a brain-storming room and bounce around ideas. After work, there's a games room where people can relax, have a beer or play the popular Japanese board game, Go.

One of Canon's biggest projects involves 80 workers developing a new flat-screen display. Many of the major Japanese electronics companies are investing much time and money in flat-screen systems such as LCDs, gas-plasma, plasma-addressed liquid crystals and all manner of exotic technologies. Major markets envisaged for flat-screen displays include PCs (notebook and desktop), in-car navigation systems and wall-hanging televisions. For some time now, Canon has been working on ferroelectric liquid crystal displays (FLCDs).

As the name suggests, FLCDs have a similar structure to ordinary LCDs. The FLCD molecules are sandwiched between glass plates and polarising filters. When a voltage is applied, the FLCD molecules change their orientation and, depending on the switching direction, will block light or let it pass through. FLCDs offer a number of advantages over conventional LCDs. They offer faster switching which means better contrast and resolution. They offer a wider viewing angle and are only several centimetres thick. What is more, they retain their memory when the power is switched off: you can switch off your PC monitor without losing the last screen display.

Canon began selling 15in FLCD monitors for PCs and workstations in Japan in January 1995, but at a cost of over several thousand pounds each they're not cheap. Canon admits FLCDs are too expensive when compared with ordinary LCD screens (which in turn cost far more than a conventional Cathode Ray Tube — CRT — display). Hence the move to a new type of flat screen display: the Surface Conduction Electron Emitter Display, or SED.

An SED works by coating electrons with an ultra-thin Palladium Oxide film and placing them on a quartz or sodalime glass substrate. On top is placed an array of phosphors, similar to ones used by conventional CRT displays. By applying a voltage, a stream of electrons are produced and these hit the phosphors, producing light.

SEDs offer some advantages over LCDs. They require a lower drive voltage and so are less power-hungry, and they have a wider viewing angle. An ordinary CRT display uses special circuits to focus the electrons on the correct line of phosphors, but SEDs don't need a focusing system so are simpler to construct.

Canon has developed a 3.1in SED prototype which, at present, requires a trolley-full of electronics to make it work. Using pictures sourced from a video-disc player, the SED device looks impressive. But more impressive is Canon's goal to convert this crude prototype into a commercial product by the year 2000. By this time, the company aims to launch a 40in SED set, which will be just ten centimetres deep and weigh around 18kg.

In the computer world, it seems you can never be too fast or have too much memory. When floppy disks became too small, CD-ROMs arrived, and higher-density DVD-ROMs look set to supersede these. Canon is looking beyond optical disc technology for a new generation of memory systems which could store the equivalent of 200 CD-ROMs on a chip the size of a finger nail.

Like many new technologies, it's based on an old idea. Canon is using a substance called Langmuir-Blodgett (LB) film, which was discovered over 60 years ago. LB film is composed of organic molecules which are similar to those formed when soap floats on water. An ultra-thin film forms on top of the water, and when this is placed on a substrate you get an LB film.

In the mid-eighties, Canon discovered that by applying a voltage to certain types of LB films you could create a memory device. The voltage alters the resistance of the LB film, which is reversible, producing a switching memory. The LB memory uses an incredibly small probe which looks like a record-player stylus. The needle tip is atomic size and placed just above the surface of the LB film. A voltage is applied creating a minute recording spot that measures just ten nanometres across (a nanometre is one millionth of one millimetre). As a result, one terabit (one million million bits) of data can be recorded in one square centimetre, some 10,000 times greater than the recording density of a CD.

Don't throw away your CD-ROM or DVD-ROM drive yet, though. Canon has managed to develop LB memories that store kilobits of data rather than terabits. And the LB system won't be cheap either. Although LB memory devices open the way to storing large amounts of music and video on a chip, Canon thinks a more likely market will be for high-quality image processing and offering higher memory capacities for notebook PCs. But don't expect to see LB devices on the market for at least five years.

Another technology on the horizon is a high-speed LAN, delivering multimedia to

Bubblejet heads in production, employees involved in a brainstorming session, and Canon's HQ

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The PC market in Japan

In 1994, fewer than one in ten Japanese households had a PC. But in 1997, this figure is expected to reach one in five. As has happened in many countries around the world, the PC has turned into a consumer electronics item. Take a stroll around the Akihabara, the computer and consumer electronics centre in Tokyo which makes London's Tottenham Court Road look like a market stall, and you'll find loads of PCs, peripherals and software outlets — some department stores sell nothing but software. There are many Japanese hobbyists who like nothing more than building their own PCs, and at Akihabara you'll find every component you could need.

Around eight million PCs were sold in Japan in 1996 and, unlike many other territories, sub-notebook and notebook PCs sell well, accounting for about one third of the market. Around three quarters of home PCs have CD-ROM drives, and this year [1997] will see the arrival of the first DVD-ROM drives. DVD movie players went on sale in Japan in November 1996.

The PC market is dominated by the Japanese companies NEC and Fujitsu, which account for 40 percent and 18 percent of the market respectively. The top-selling Western PC brands are IBM (ten percent) and Compaq (less than four per cent). The Apple Macintosh has around 14 percent of the market. But when it comes to software, Microsoft rules, with Windows 95, Office and Word being some of the biggest-selling programs.

Another top-seller is a program called Ekispert (sounds like expert) which is used to calculate travelling expenses. Many Japanese employees spend a considerable time commuting to and from work, especially to major cities like Tokyo and Osaka. Ekispert presents users with an on-screen graphical display of train stations, and users simply click on the stations they use. The program then automatically calculates the cost. Eikspert is so popular that it comes pre-loaded on many home PCs.

Japanese consumers have also taken to digital cameras, with around one million units expected to have been sold in 1996.

The internet has also exploded in Japan, with internet cafés springing up in major cities. According to Cyber Space Japan, there were over 200 ISPs in Japan at the beginning of 1996. The biggest group of internet users are aged 20 to 29, and 97 percent are male. Around three million people use online services.

Many consumer electronics companies are also offering products that span home computing and home entertainment. Sharp and Sanyo market televisions with built-in web browsers, with the latter selling around 2,000 units a month. Hitachi has developed a digital camera that records both still and moving video images on a PC Card. The 260-megabyte PC Card hard disk can store 2,800 still images, 18 minutes of MPEG-1 video, or about four hours of audio.

The Japanese electronics giants, Sharp and Fujitsu, have joined forces to launch a new type of online television guide called InterTV. The system offers an electronic program guide which displays the channel information in the form of a table on a PC screen. Users can customise the tables so that, for example, they display programmes by time, channel or genre. It is also possible to link up to web pages devoted to television personalities or television channels.

Fujitsu has developed special software that allows InterTV users to program their video recorder from their PC. Once the video timer has been sent, the data can be sent from the PC to the video recorder via an infra-red communication port.

Hitachi has developed the Interdisc, a CD-ROM which stores a mix of video clips, web pages and Netscape Navigator. The video clips use VHS-quality MPEG digital video, but PC users do not need a special video board to view them as all playback is done with MPEG software on the disc. Hitachi hopes that companies selling similar products or services will put their web pages onto an Interdisc CD-ROM.

the desktop. These networks will use fibre-optic links operating at speeds of up to 156Mb/sec. By comparison, ISDN offers speeds of up to 128Kb/sec. Canon is developing a multimedia LAN that will serve up to 32 PCs with video, sound, graphics and animation, but it won't reach the market for several years.

One technology that *has* arrived is a new bubblejet system which can be used for fabric printing. Canon launched its first bubblejet printer in 1981, and makes machines for Apple and Hewlett-Packard. Bubblejets use an array of ultra-fine nozzles, each one about half the thickness of a human hair. The nozzles are filled with ink which is heated. The heat causes a bubble to form, which expands and is then ejected from the nozzle. Each nozzle discharges 6,000 ink droplets a second. For comparison, a hummingbird flaps its wings 100 times per second.

"When we first developed the bubblejet, we wanted it to replace the dot-matrix printer," says Takashi Saito, director of Canon's Bubblejet Product Group. The speed at which inkjets (which includes bubblejets) have come to dominate the printer market is testament to the format's ability to offer near-laser print quality at affordable prices.

Around 60 million PCs were expected to be sold around the world in 1996, along with 42 million printers. Dot-matrix printers were forecast to sell around six to seven million units, laser printers seven to eight million, and inkjets, a massive 30 million units. Inkjet technology is also used in faxes, photocopiers, electronic typewriters, standalone word processors and even notebook PCs with built-in printers.

Now, bubblejet technology is being used by the textile industry. Canon has invested about £30 million on the technology which can print on fabrics including cotton, silk, nylon, wool and polyester. Tests are also being done on leather and sheepskin. The bubblejet fabric printer is a massive machine which looks like a modern paper printing press and costs around £700,000.

The fabric printer prints at 360dpi and uses 9.6cm-wide print heads, each of which has 1,360 nozzles. There are eight ink stations and sixteen print heads arranged in two groups to allow two-way printing. The system offers up to 250 gradations of colour and prints at speeds of up to one metre per minute. The fabric printer can also print on materials up to 1.65 metres in width.

The fabric printing system uses special image transfer software which has a palette of 16.7 million colours. The

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Ichiro Endo, the man who discovered the bubblejet

If researchers were paid royalties on their discoveries which became commercial products, Ichiro Endo could have retired years ago. In 1977, Endo accidentally placed a soldering iron against a syringe full of ink and noticed that the ink squirted out. This led to the bubblejet printer. Bubblejets are Canon's fourth largest revenue earner, accounting for over £1.5 billion of sales. Today, Endo is managing director of Canon's New Products division, whose brief is to to come up with products for the multimedia age.

Q *How is the computer industry changing?*

A In the past when people talked about computers and communication, the computer was the main part of the setup. But in the era of internet, intranets and extranets, the situation has changed. The computer is now part of a network and has started to merge with peripherals and AV [audio-video] equipment. The computer is becoming more transparent, and the input/output (I/O) device is becoming more critical as it becomes the interface between the user and the computer. Canon of course makes many I/O devices, such as scanners, printers and digital cameras.

Q *We hear a lot about the paperless office. Will it happen?*

A I think paper-based information and electronic-based information will remain, but people will want them to be seamless. Today, people copy documents onto paper and distribute them, but I think the model proposed by Hewlett-Packard, whereby people distribute documents electronically and print them locally, is more likely to grow.

Q *How important are industry standards?*

A We want Canon products to connect to each other and to others, so of course standards such as NetWare and Windows NT are important.

Q *Who will be your main competitors in the multimedia age?*

A In terms of Japanese companies, it will be giants like Toshiba, Hitachi and Matsushita [Panasonic/Technics/JVC]. In our traditional markets, our consolidated sales are already higher than Xerox. I feel Hewlett-Packard is a strong potential competitor, although it is also an important partner.

Q *You didn't mention any software companies in your list, such as Microsoft.*

A My personal view is that the Wintel companies [Microsoft and Intel] are somewhat tied to the PC business, while others such as IBM, Sun and Oracle are moving towards the Network Computer. I'm not sure which will win the battle, perhaps we will see next year.

Q *But in your model of the evolving computer, the PC would appear to be outdated.*

A Maybe that's one interpretation, but at the same time, we should not underestimate the power Wintel has. In all honesty, we do not care who becomes the winner, as long as the I/O devices enjoy good business. What's more important is how we shift towards the human-centric side of computing.

Q *What is being developed by the New Products Division?*

A We have already produced a digital camera which is on the market [the PowerShot 600] and we are also developing an internet camera that can be linked to a computer anywhere in the world via the internet. So you could be in Japan and yet control a camera that was in Europe. Another product is the digital document distribution system (DDD) which will work with our digital copiers. After a document has been scanned, the software will govern where it is to be distributed. We are also developing flat-screen displays. And there'll be other products, but it's too soon to talk about them yet.

design artwork can be scanned into the system or taken from a CD-ROM or other storage medium. A PC carries out colour matching, editing and manipulation. The system runs under Windows and handles images from Adobe Photoshop.

Canon says that one of the system's big advantages is its speed. A production cycle, from design to printing, can take three days, compared with two months when using conventional fabric printing methods. Takashi Saito says that while Canon's system is in competition with rotary and flat-screen printing systems, it's not designed to replace conventional printing technologies: "If you want a fast turnover then our system is good," he says, "For instance, if you need to respond to fashion changes quickly. And if you are producing small orders of up to 50 metres, then our system is cheaper than traditional methods." He adds that the fabric printer is more environmentally friendly, as there is no waste ink or water.

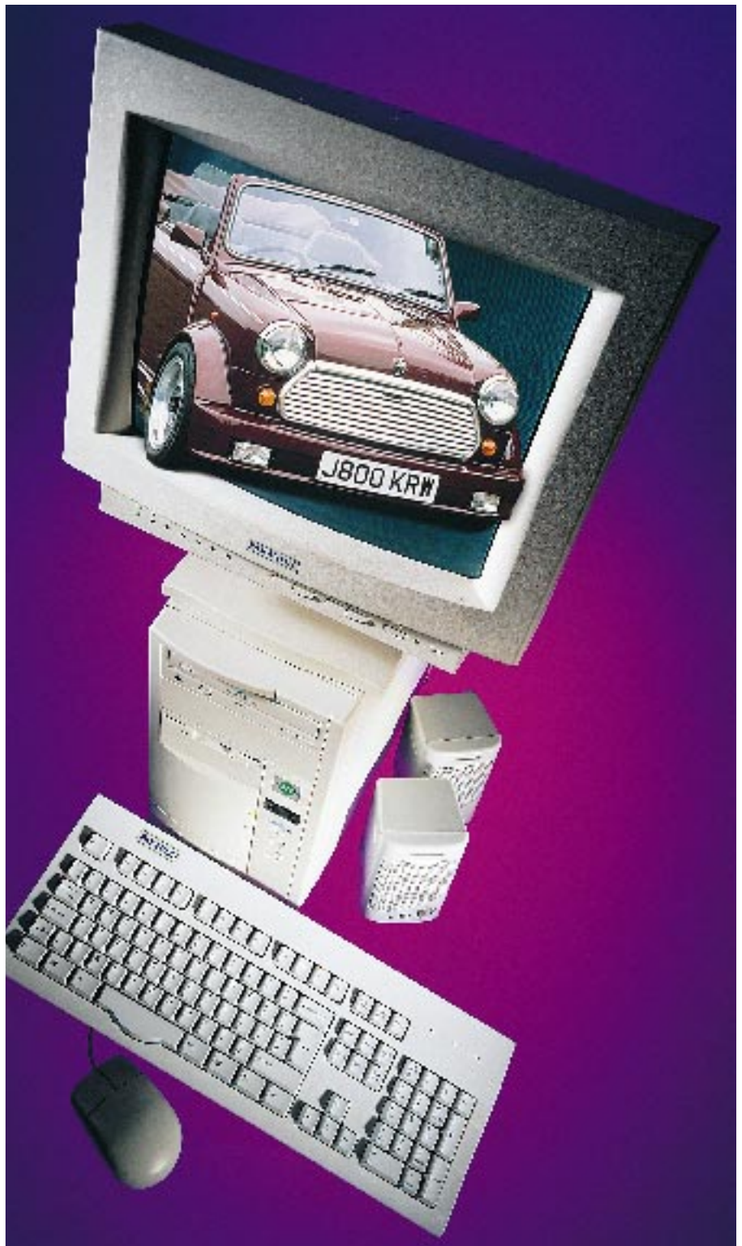
But Saito admits that Canon's fabric printing system has drawbacks. The actual printing process is slow, which means higher costs. Saito says it's currently two to three times more expensive than other mass production systems but there are plans to halve this by increasing the printing speed. Vivid colours are not yet possible, and on some fabrics there is a small risk of ink rubbing off.

Even so, the Japanese company Kanebo is selling ties, scarves and other goods printed with Canon's system, and the Japanese designer, Issey Miyake, has produced leather coats printed with the bubblejet technology. Canon adds that several European companies are also interested in the technology. Another Japanese company, Okasei, is using bubblejet technology in card-vending machines on street corners which people use to make up personal and business cards.

New technologies like digital cameras and camcorders need good-quality hard-copy systems, and Saito showed what the next generation of bubblejet printers could be offering. Handing around large colour glossy prints made on a bubblejet, Saito asked the press to examine the quality. The resolution wasn't as good as that from a 35mm print but it was pretty damn close. This type of picture quality should be available in about a year.

Looking further to the future, Saito (who already has four bubblejet printers at home) foresees a time when televisions will have built-in web browsers for surfing the net: "Your television could also include a built-in bubble-jet printer, for printing out reports from electronic newspapers," he says. It's the ability to generate lateral thinking like this that shows why Canon is likely to remain a major force in the multimedia age. ■

Low and behold



If your bank balance is having a prohibitive effect on your PC purchasing power, a budget model might do the trick.

In December we looked at what sort of PC system you could get for around £1,300 (ex VAT). This time we've gone one step cheaper, and rounded up a group of PCs priced at around £850 (ex VAT). This is a remarkably cheap price tag for a PC, but nevertheless represents a large expenditure. The same money could buy you a decent little second-hand car that's relatively rust free, starts every time, and gets you from A to B with no unscheduled stops. In the pages that follow, we'll see if the metaphor can be applied to our PC contenders.

We asked manufacturers for a machine with a specific price tag, which had a 133MHz processor and 16Mb of RAM. We requested, but did not always receive, a starter pack of software. And we asked for the best monitor available within our budget. So if your dreams of owning a top-of-the-range PC are scotched by a reality check on your bank balance, and price is more of a consideration than performance, the ten systems we've gathered together here will show what you are likely to get for your money.

Budget PCs Contents

Compiled by *Lynley Oram*

Budget PCs Photography by David Whyte

Bytewise Technology Swift P133

Bytewise, based in North London, has been making PCs for the last seven years. It is a small company, with a staff of seven and an annual turnover of about £1m.

Unfortunately, the Swift's parallel and serial ports are fitted to blanking plates which are in the way of two of the free PCI slots. Although Bytewise hasn't blocked off all the PCI slots, only one has a free blanking plate. This makes it difficult to install PCI cards at a later date without some serious tinkering.

A full-length card could be fitted into one of the two remaining "free" PCI slots. One slot is already occupied by the graphics card.

A 16-bit sound card, from BTC, took up one of the four ISA slots. There is one free, forward-facing 3.5in bay. Before installing anything into the spare 5.25in forward-facing bay, though, you need to remove a lump of cabling that's bound and stored there.Despite tucking most of it away, there is still enough spare cabling to obscure the RAM. A little dig around uncovered 16Mb taking up two of the four SIMM slots. There were also two vacant DIMM slots, although it's currently not recommended to mix SIMMs with DIMMs.

The Abit motherboard makes use of a Triton 430VX chipset and had 256Kb of on-board cache. Although there is an empty CELP slot, it could be difficult to use: a fairly taut cable, linked to the processor's heatsink, ran right across it.

The magnetic shielding on the Juster speakers was minimal. Placing the speaker with the power pack next to the monitor wrought havoc with the image.

● **Monitor** The CTX wasn't bad for a budget 14in monitor. It only needed a little tinkering to remove the flicker. The plug-and-play monitor was Energy Star compliant and MPR II rated.

PCW Details

Hardware Bundle Juster Multimedia Speaker System.
Software Bundle Toplevel Complete Works.
Warranty Terms Three years RTB. On-site options are available.
Technical Support Toll-free support line, and fax support.
Price £910.63 (£775 ex VAT)
Contact Bytewise 0171 275 8853
Good Points A good price. Room for expansion and updates.
Bad Points More attention could have been paid to the build of this PC.
Conclusion A mediocre machine that deserved more attention during its manufacture.

Software Quality	★★★
Build Quality	★
Warranty	★★★
Overall Value	★★★

Choice Systems Ultra Multimedia P133

This machine differed from the rest of the PCs in our test as it came with a ten-speed Acer CD-ROM, rather than an eight-speed. This CD-ROM was quieter than the others we reviewed and had a slightly superior build quality. The asking price for this PC was one of the highest and it would be a matter of personal preference as to whether it would be worth paying a premium for these features in particular. However, it is a fast machine and achieved second place in our VNU Labs test.

The short tower case, a design which also houses the Paragon Intel P133 (*see p140*), is stiff and required some effort to get inside. Some of the cables obscured the RAM, which was a shame as the rest were neatly tied up out of harm's way. The 16Mb of RAM left two SIMM slots vacant, plus one empty DIMM slot.

Both the graphics card and the motherboard were made in Taiwan by TMC. The motherboard had been fitted with a Triton II 430VX chipset, and had 256K of on-board pipeline burst cache. The CELP slot was left vacant, making it possible to upgrade the cache at some time in the future.

A 1.2Gb Quantum Fireball hard drive completed the sub-system.

Only one of the three spare PCI slots will take a full-length card. The soundcard, a SoundBlaster 16 from Creative, filled one of the ISA slots. Even though it may be possible to fit a longer ISA card into one of the two remaining slots, this probably would not be desirable as the card would be pushed up against the processor. It was disappointing to find no software included.

● **Monitor** The 14in monitor, from AOC, is Energy Star compliant and MPR II rated. It had all the usual buttons, apart from degaussing.

PCW Details

Hardware Bundle Juster computer media speaker system.
Software Bundle None.
Warranty Terms 5-year RTB (first year parts and labour).
Technical Support Fax only.
Price £1,056.33 (£899 ex VAT)
Contact Choice 0181 993 9003. Fax 0181 993 9936
Good Points Ten-speed CD-ROM. Vacant CELP slot.
Bad Points Stingy with the software.
Conclusion We would have preferred a larger monitor rather than the faster CD-ROM. A bit more thought should be put into the future of this machine.

Software Quality	★
Build Quality	★★
Warranty	★★★★
Overall Value	★★★

p137 ➢

Edge Conquistador P166+

Edge normally ships this PC with a Cyrix P166 processor, but in order to meet the specifications of our group test the processor supplied was an Intel Pentium 133 (the selling price remains the same).

The software that arrived with this PC was impressive. The bundle included Mechwarrior 2, Earthworm Jim, Pitfall: The Mayan Adventure, and Lotus SmartSuite 96 (which was in the box, but not loaded on the PC).

Any good feelings we had about this desktop evaporated when the casing came off. The innards were incredibly cramped and messy. The four SIMM slots were buried beneath layers of cabling, all of which would need to come out if you wanted to get to the 16Mb of RAM.

There were four ISA and three PCI slots, of which only two were occupied. Edge has made it difficult to use the remaining PCI slots, as all the adjacent blanking plates have been used for the parallel and serial ports. This effectively blocks the PCI slots, so you would need to be handy with a screwdriver if you wanted to fit any cards in here. With the remaining space filled with the processor and heatsinks, there is no room to fit anything other than half-sized cards into the ISA slots.

The sub-system comprises a Diamond Stealth 3D 2000 graphics card with 2Mb of RAM and a 16-bit Sound Adapter sound card from KTX. The 1.2Gb Seagate hard drive sounded like there were pebbles rattling around inside.

Mitsumi made the keyboard, mouse, and the 8x CD-ROM drive that came with the machine. The KTX motherboard used a Triton III VX chipset and had 256Kb of on-board cache.

● **Monitor** The KTX 14in monitor suffered from noticeable flicker, even when we altered its controls. Its power-saving feature meets EPA requirements but we could not find any MPR II rating.

PCW Details

Hardware Bundle Advance speakers.
Software Bundle Mechwarrior II, Earthworm Jim, Pitfall, Lotus SmartSuite 96.
Warranty Terms Two years, back to base.
Technical Support Toll-free phone line and fax support.
Price £974.08 (£829 ex VAT)
Contact 0181 232 8811. Fax 0181 232 8600
Good Points Good software bundle.
Bad Points Lacked future-proofing.
Conclusion A product quality rethink is overdue at Edge. It would not have taken much effort, and not a lot more time, to have turned this PC into a good little runner.

Software Quality	★★★★
Build Quality	★
Warranty	★★
Overall Value	★★

Express Micro Rapier ELS P133

Modems are getting cheaper, so it was great to see that at least one of our budget PCs came ready to hook up to the internet. The Choice modem used had a speed of 33.6Kbps and was BABT approved. To get us browsing the web, a couple of net sign-up trials had been included.

The short tower casing made a definite style statement. We'd be happy to see the lilac buttons go, but recessing the LED display lights inside slots was an inspired move. The resultant soft glow evoked images of lounge lizards in smoking jackets, relaxing to Burt Bacharach music.

On the negative side, although this machine had some nice features, its performance let it down; it came last in our VNU Labs test. And, while its insides were not the messiest we saw, Express Micro could nevertheless improve its housekeeping.

Unnecessary cabling made it difficult to get to the RAM. And, with the power cable for the processor running directly over the Cirrus Logic graphics card, fitting cards in the future would be fiddly.

With various components cluttering the area, there is really only enough room to fit half-length ISA cards. But if size is your thing, there's room for larger PCI cards. The motherboard had 256Kb of pipeline burst cache fitted into a CELP slot, and an Opti Viper chipset.

Frustratingly, Express Micro had forgotten to include a power plug in the PC's box. It's an easy item to leave out, but a vital component. It's rather like taking delivery of your new Ford Fiesta and discovering the manufacturer had forgotten to fit the ignition.

● **Monitor** While the 15in monitor from Videal looked good and had a flat screen, the image was badly focused and it didn't fare as well in testing as some of the 14in monitors in the group.

PCW Details

Hardware Bundle Arowana speakers.
Software Bundle Lotus SmartSuite.
Warranty Terms One year on-site. Option for three years on-site.
Technical Support Fax support.
Price £996.40 (£848 ex VAT)
Contact Express Micro 01909 530866. Fax 01909 530966
Good Points At least the effort was made to include a 15in monitor even though the quality wasn't brilliant. Modem.
Bad Points Could be faster, tidier, and a bit less cramped.
Conclusion This PC has great potential. It also has features, such as the modem, that we would like to see more often.

Software Quality	★★★
Build Quality	★★
Warranty	★★
Overall Value	★★★

p138 ➢

Fox Premier P133

The Premier P133 had a Cyrix P133+ chip running at a modest 110MHz. Fox was the only supplier to choose Cyrix for its machine and deserves a pat on the back, because the Premier outperformed most of the Intel chips and came fourth in our VNU Labs test.

Fox has been generous with the software bundle, including a Microsoft Entertainment pack which contained MS Golf, Encarta 96, MS Works and Money, Creative Writer, and a Magic Bus CD-ROM for the kiddies.

Space is always at a premium in a desktop, yet there was no need for Fox to have clumped the cables together and jammed them into the gap between the graphics card and the power supply. Getting at the RAM and the four SIMM slots is almost impossible. Even with the cables out, installing extra RAM would probably have taken the skin off our knuckles, because one of the SIMM slots is awkwardly placed under the power supply.

The 256Kb of pipeline burst on-board cache can easily be upped to 512Kb as the Abit motherboard has a vacant CELP slot. Otherwise, there is very little room for expansion. None of the three PCI or four ISA slots will take cards longer than half size.

The 1.2Gb hard drive, from Quantum, had only been partially placed in its 3.5in bay. It had been pushed back from the front of the case by the positioning of the power button, preventing the installation of lengthy cards nearby. Really, there is insufficient room to fit more 3.5in devices in the case, although it could be done if you were determined enough.

● **Monitor** At even its best settings, the 14in Samtron suffered a noticeable flicker. It is MPR II rated, and has a power management circuit.

PCW Details

Hardware Bundle JS Jazz J201 speakers.
Software Bundle MS Entertainment pack: MS Golf, Encarta 96, MS Works and Money, Creative Writer, and Magic Bus.
Warranty Terms Five years back to base. First-year parts and labour. Last four years labour only. Options for second and third year on-site.
Technical Support Standard phone call.
Price £994.44 (£846.33 ex VAT)
Contact Fox 0990 744500. Fax 0990 502207
Good Points Room for increased cache.
Bad Points Cramped, messy and with little room for expansion, for either cards or devices.
Conclusion Not an ideal machine for those who want to add extras at a later date.

Software Quality	★★★
Build Quality	★★
Warranty	★★★★
Overall Value	★★★

Innovations Direct ID 3D2000 P133

Personal Computer World Highly Commended

This machine was let down only by its lack of speed, ending up second to last in our VNU Labs test. Apart from this, Innovations Direct has done a competent job of putting together a budget PC.

Things really improved once we got inside. Cables were neatly arranged and tucked out the way. The four SIMM slots were clearly visible and easy to get at. Two were occupied with 16Mb of EDO RAM, and these popped in and out with ease.

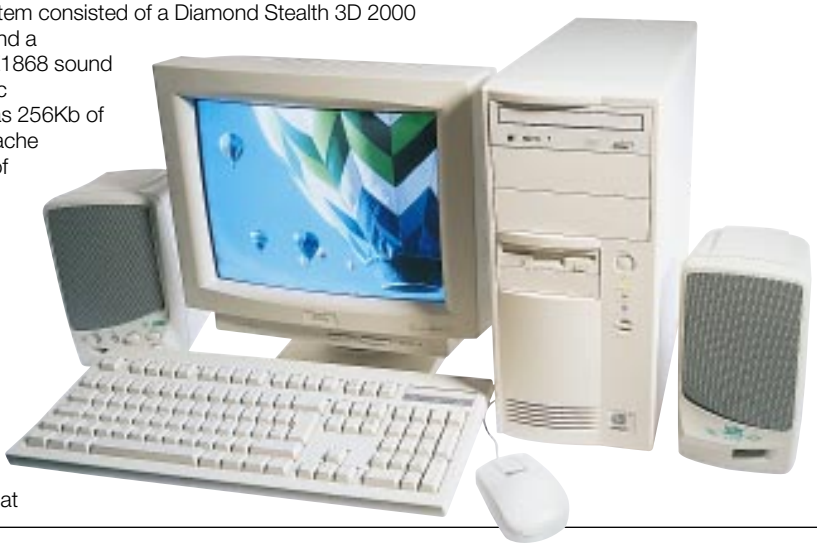
None of the motherboard's components were in the way of the three PCI slots, making future upgrades to full or three-quarter sized cards a doddle. Unfortunately, only one of the four ISA slots had room for a longer card. None of the slots were shared.

The sub-system consisted of a Diamond Stealth 3D 2000 graphics card and a Flagpoint FPS E1868 sound card. The Protac motherboard has 256Kb of pipeline burst cache and made use of an Intel Triton III 430VX chipset.

We were worried about the size of the Sanyo Denki heatsink, which was almost half an inch smaller than the processor. However, we were assured that it would be able to do its job, despite being "horizontally challenged".

There was a reasonable amount of room left for extras. The company had opted to install a 5.25in 1.2Gb Quantum hard drive, leaving one empty forward-facing 5.25in bay. Of the three spare 3.5in bays, two were internal.

● **Monitor** An extra inch may not seem like much, but the Iiyama Vision Master 15 is miles ahead of the rest of the pack. The screen is flat, it is Energy Star and MPR II rated, and controls are on-screen and include all the adjustment controls you would expect.



PCW Details

Hardware Bundle Labtec LCS950 speakers.
Software Bundle None.
Warranty Terms Five years RTB, plus advance replacement option.
Technical Support Fax.
Price £1,056.33 (£899 ex VAT)
Contact Innovations Direct 0181 923 6666. Fax 0181 923 6655
Good Points Some space for upgrades, and for fitting extras. Long warranty.
Bad Points Quality control not up to scratch: the supplied power cable was faulty. Lacking in software.
Conclusion Definitely worth paying more for the larger monitor.

Software Quality	★
Build Quality	★★★★
Warranty	★★★★★
Overall Value	★★★★

p140 ➢

Paragon Intel P133

There is nothing intrinsically wrong with this PC, but there is nothing to get excited about either. If price is your sole consideration when buying a computer, then Paragon has put together the ultimate no frills budget model. It's not a fast machine, but then, this PC wasn't built for speed.

We were puzzled about why the 1.2Gb Seagate hard drive and Samsung 8x CD-ROM drive were connected to the same EIDE channel, leaving the second EIDE channel connector vacant: in past tests, we have found that this arrangement can slow hard drive performance while the CD is in operation.

Most of the components were inexpensive yet fairly respectable. The Intel motherboard uses an Intel 430VX chipset, and there's 256Kb of pipeline burst cache in a CELP slot. The Opti sound card is 16-bit SoundBlaster compatible and the graphics card has 1Mb of video memory. There's enough room to fit three-quarter length cards into some of the PCI and ISA slots. Serial and parallel ports have been inconveniently placed in one of the PCI blanking plates which will have to be moved if you want to make use of the two spare PCI slots.

Paragon has been a bit careless with its cables; they were hastily bundled and obtrusive. We could just about get to the RAM without having to remove any cables. Of the four SIMM slots, two were occupied by 16Mb of RAM.

If you think you may want to spend more money in the future, there's room inside for a couple of extra devices. The short tower has two spare forward-facing bays (5.25in and 3.5in).

● **Monitor** The 14in Targa monitor is MPR II rated and Energy Star compatible. On a negative note, the power cable had to be jiggled about before the display would work.

PCW Details

Hardware Bundle Multimedia speakers.
Software Bundle None.
Warranty Terms Three years return to base (first year with parts and labour; second and third years, labour only). Option for three years on-site.
Technical Support Free lifetime telephone and fax support.
Price £880.08 (£749 ex VAT)
Contact Paragon 0181 478 8700. Fax 0181 478 0001
Good Points Excellent technical support, backed by a good warranty.
Bad Points Single channel for the CD-ROM and hard drive. Ports in the PCI blanking plates.
Conclusion An inexpensive machine, okay for a first-time buyer, but could have been a bit more generous with the software.

Software Quality	★
Build Quality	★★
Warranty	★★★
Overall Value	★★★

Roldec Pro P133

Roldec has set out to make a sturdy budget PC, and it is on the right track with this model. From the point of view of configuration it doesn't particularly stand out from the crowd, but in testing it performed well, taking third place on our Labs test chart.

Roldec hasn't lavished money on the casing: one of the screws was badly threaded and had to be coaxed off, and the case needed a few thumps to get it back on.

The machine came with Lotus SmartSuite ready-installed. The innards were tidy, if a little cramped. Out of the four ISA slots, there's really only room to fit one full-sized card. It may be possible to squeeze in two, three-quarter sized, cards.

The sound card occupying one of the ISA slots was a respectable SoundBlaster Vibra 16 from Creative Labs, and a Diamond Stealth Video 2500 graphics card has been fitted into a PCI slot. That left two PCI slots spare, and three ISA slots free, with one shared.

Two of the four SIMM slots were occupied by 16Mb of RAM. These were easy to get at but not so easy to get out. The machine was fitted with 512Kb of cache. Externally, the computer had one spare forward-facing 5.25in bay and a spare external 3.5in bay.

The keyboard certainly rates a mention. It was nicely contoured and stylish but, more importantly in these days of RSI awareness, it came with a clip-on wrist rest.

● **Monitor** The image from the Princeton 14in monitor was easy on the eyes, and the screen was Energy Star compliant and MPR II.

PCW Details

Hardware Bundle Juster multimedia speakers.
Software Bundle Lotus SmartSuite.
Warranty Terms Two years RTB, with one or two years on-site options.
Technical Support Free phone support. Fax support.
Price £998.75 (£850 ex VAT)
Contact Roldec 01902 456464. Fax 01902 452592
Good Points Monitor. Keyboard. Software.
Bad Points Lacked the room for longer PCI and ISA cards.
Conclusion A good, if unexciting, machine.

Software Quality	★★★
Build Quality	★★
Warranty	★★
Overall Value	★★★

p144 ➢

Stak Trading Diamond Discovery

Personal Computer World Editors Choice

Having seen so many examples of sloppy workmanship, this machine was a joy to behold. It had been put together with care and we liked the way the motherboard had been arranged. It had twice as much cache as most other PCs in this group, with half of the 512Kb cache on-board and half installed in a CELP slot.

A quick glance at our VNU Labs test results shows that this PC was the fastest in the group. Oddly, Stak has opted to connect both the CD-ROM drive and the 1.6Gb hard drive to the same EIDE channel and, as could be the case with the Paragon (*see p140*), this may slow down the operation of the hard drive. There is a spare EIDE connector vacant.

All the cables had been glued into position to keep them in place during transit. According to the company, the glue should just peel off. This wasn't as easy as it sounded and needed a flat-edged tool. There were four PCI slots, with only one occupied and none shared. A VideoLogic Grafixstar 400 graphics card took up one of these, and it would be possible to fit a full-length card in here. A three-quarter sized card is as large as will fit in the ISA slots. The 16Mb RAM could be removed with ease and along with the four SIMM slots there was a DIMM slot. Stak gained status by including a Logitech Pilot mouse and Creative speakers, and the software bundle is substantial.

● **Monitor** For its size, the 14in monitor from ADI produced one of the best images in our test. The screen regulation was excellent and the picture was flicker free.

PCW Details

Hardware Bundle Creative CS120 speakers.
Software Bundle MS Encarta 96, Actua Soccer, Disney's Toy Story, and Hunchback of Notre Dame.
Warranty Terms 1-year RTB; no options.
Technical Support Customer service number. Fax support
Price £998.75 (£850 ex VAT), *as a special offer to PCW readers only; use our Buyer's Charter order form (p346).*
Contact Stak Trading 01788 577497. Fax 01788 544584
Good Points Cache. Performance. Mouse.
Bad Points Glue. Single channel for the CD-ROM and hard drive.
Conclusion A good machine for beginners, and offers future potential for more experienced users on a tight budget.

Software Quality	★★★
Build Quality	★★★★
Warranty	★★
Overall Value	★★★★

Tiny P133 Multimedia System

Most of the computers in this test had Intel chips but this was one of two that didn't. Instead, Tiny has gone for an AMD K5 PR133 processor, with a speed of 100MHz. Despite the slower speed, this PC still managed a respectable sixth place in our VNU Labs test.

The company hasn't been stingy with the software. This machine came with a whole bag of software goodies, from MS Works to Actua Soccer.

We had to invest a lot of elbow grease in removing the casing. There's one screw to remove and the casing should then just slide off — at least, that was the theory. In reality, it took two people to open it. Once in, though, there was a whole pile of cabling to be moved out of the way before we could get at the RAM. Two of the four SIMM slots had been fitted with 16Mb of RAM, with a DIMM slot left vacant.

The VideoLogic Grafixstar 400 card had been fitted into one of the two PCI slots (there were four in total) that would take a longer than half-length card. There were three ISA slots, one of which was occupied by a Crystal 16 sound card. The motherboard was one of Tiny's own, a Spear SR-M504, and had been fitted with 256Kb of on-board pipeline burst cache.

There were two spare 5.25in bays, one of which was internal. Forget fitting any 3.5in devices though: there's one internal bay spare, but we would have had to take out the 1.3Gb Fujitsu hard drive to get at it.

● **Monitor** The SM483C 14in monitor, made in Korea by Samsung, produced a good picture and was Energy Star compliant.

PCW Details

Hardware Bundle Unbranded speakers.
Software Bundle Encarta , MS Works and Money, MS Dangerous Creatures, plus 3D games: Mechwarrior, Terminal Velocity, Havoc and Actua Soccer
Warranty Terms One year back to base; options for first, second and third years on-site.
Technical Support Fax support.
Price £962.33 (£819 ex VAT)
Contact Tiny 01293 821333. Fax 01293 822514
Good Points Software.
Bad Points Messy and cramped inside.
Conclusion Not a bad machine, but could do with more room inside for fitting extra devices.

Software Quality	★★★★
Build Quality	★★
Warranty	★★
Overall Value	★★

VNU Labs Report: How we did the tests

Different types of applications measure different aspects of a PC's performance, so it is important to use more than one benchmark to gain an accurate and rounded picture of each machine. With each successive *PCW* group test new technology appears, therefore our tests are continually enhanced to reflect these changes.

Each of the ten machines reviewed here has been put through two separate tests. The first is a standard system-level test designed to closely simulate real-world use. Complete versions of industry-standard Windows 95 applications are installed (currently Word, Excel, WordPerfect and FoxPro) so that performance can be assessed in the three key areas of word processing, spreadsheets and databases.

A collection of macros is 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 application macro containing the {COPY} instruction will first trigger the stopwatch. When the copy has completed, the time taken is written into a database file. Each test is run three times to provide a consistency check, and the performance score recorded for each application test is averaged out to produce one overall figure.

The second is a low-level benchmark test run in DOS (native mode) measuring the frame-rate performance from Doom 2. You can try this test on your own PC. Quit Windows or shut down and restart in MSDOS mode, set up Doom 2 to run full-screen (no status bar or sound), then exit. At the command prompt in the Doom directory, type

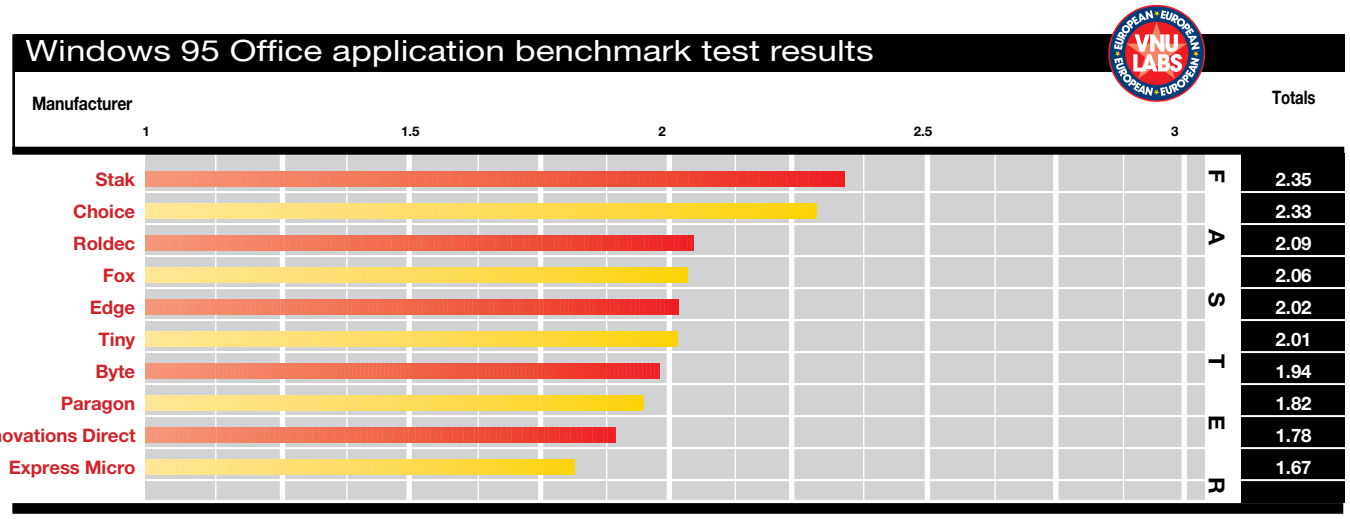
DOOM2 -TIMEDEMO DEMO1

which starts one of Doom's demos. It runs for a short time and then exits, producing two figures. Divide the first by the second and then multiply by 35. The final figure is a measurement of frames rendered per second (*see the Results graphs, below*) where bigger is faster and better.

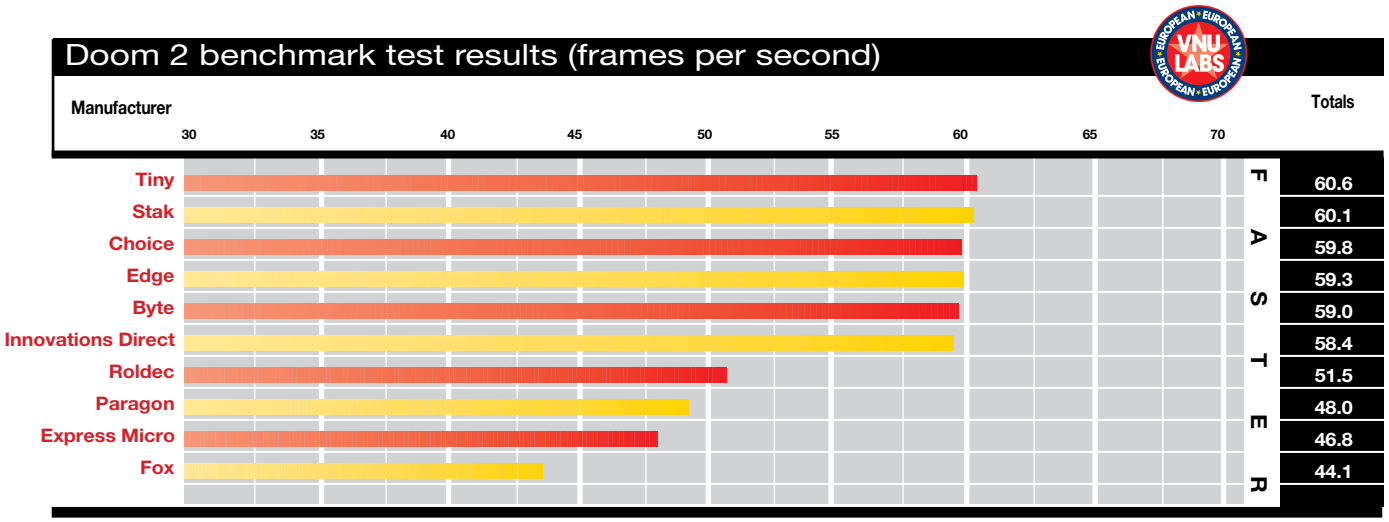
The Doom 2 test is an important low-level test which particularly stresses the graphics card, processor and hard disk, and gives a good impression of how the machine will perform while running games which are resource intensive.

Eleanor Turton-Hill

Windows 95 Office application benchmark test results



Doom 2 benchmark test results (frames per second)



p148 ➢

Editor's Choice

Personal Computer World Editors Choice

This group test taught us a thing or two about budget PCs. We were surprised at the variable quality of the machines and the sort of features a computer from the lower end of the market could offer.

Of course, we're not talking about state-of-the-art 3D graphics cards or Zip drives here. We were pleased enough that one of the PCs came with an internal modem, and that a couple of companies opted for 15in monitors.

When we first drew up the specifications for this group test, we were going to ask for a 120MHz processor. However, many companies we approached had dropped that model and were installing 133MHz chips into entry-level machines. There was a bit of variety here, with eight of the machines using Intel chips, one opting for Cyrix and another choosing an AMD processor.

Typically, these budget PCs came with a 1.2Gb hard drive, 256Kb of Level-2 cache, a basic 16-bit sound card, 8x CD-ROM drive, average 14in monitor and very little software. There were a few exceptions. Express Micro managed to get an internal modem into its machine; a definite plus, and one we'll hopefully be seeing more of at this level. Choice installed a slightly faster 10x CD-ROM, and there were a couple of lockable cases from Bytewise and Fox.

The winner of our Highly Commended award, Innovations Direct, went for a 15in monitor which in our opinion is a wise choice. Several manufacturers tend to use 14in and 15in respectively as code for poor or good quality monitors. Innovations Direct came close to getting our Editor's Choice award, but was let down by its speed and lack of software. What did push it to the top of the heap was its lengthy warranty — five years return to base. The advance replacement option could prove to be very handy if you were relying on this machine to help run a small business.

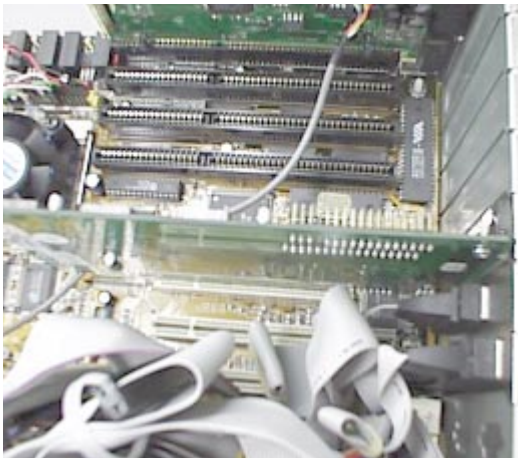
Both Roldec, and the winner of our Editor's Choice award, Stak, had opted to install 512Kb of cache. Performance alone didn't influence our decision as there was very little difference between the top speed of Stak's machine and the second fastest performance of Choice's PC.

What really clinched the award for Stak was the care and attention that had gone into putting its system together. Someone who's opting to buy a budget PC probably won't be spending much more money on replacing peripherals. Stak has thought of this and has included some goodies, like a Logitech mouse and Creative speakers.

For regular readers of *PCW*, who drool over the latest gear but haven't got the money to match, Stak's PC has some future-proofing features. The insides were tidy, with easy access to its components, and there was room to fit extras. Another plus was the Western Digital hard drive, which had a sizeable 1.6Gb-worth of storage space. What also appealed to us was the something-for-everyone software bundle that came with this machine. For the ultimate software package though, Edge came up trumps, including Lotus SmartSuite as well as some stonking games like Mechwarrior II and Pitfall.

We were bothered by the level of build quality encountered with most, although not all, of these PCs. Unnecessary and messy cabling that, in various machines, obstructed access to the RAM, covered a CELP slot, or blocked in a graphics card. Serial and parallel ports unnecessarily fitted to the PCI blanking plates. A missing power cable. Cramped motherboards with no room to fit longer cards. Dodgy casing… the list goes on. Although most people would not expect to be able to buy a top-of-the-range item from for £850 (plus VAT), we do not think it is unreasonable to expect a PC to have been competently put together.

The overall impression given by all this is one of companies not willing to waste their time for such relatively trifling sums of money. This attitude sells the company short as well as its customers. After all, these are customers who may think they only want a budget PC *today*. But once bitten by the bug, who knows what they could end up buying tomorrow. ■



How not to build a PC: These photos show an alarmingly common mistake made by several of the manufacturers featured in this group test. Right Despite being able to mount the serial and parallel ports directly onto the case, they have instead been fitted to blanking plates and, worst of all, screwed into the gaps of the spare PCI slots. These plates would have to be removed and relocated to fit more PCI cards, and that's if you can get past the maze of cabling. Far right Notice the serial and parallel ports on blanking plates next to the video card where other PCI cards should go, and the tragically unused punch-out holes in the case

p151 ➢

Table of Features





Manufacturer	Bytewise Technologies	Choice Systems	Edge	Express Micro	Fox
Model	Swift P133	Ultra Multimedia P133	Conquistador P166+	Rapier ELS P133	Premier P133
Tel No.	0171 275 8853	0181 993 9003	0181 232 8811	01909 530866	0990 744500
Fax	0171 275 8344	0181 993 9936	0181 232 8600	01909 530966	0990 502207
Price	£910.63 (£775 ex VAT)	£ 1,056.33 (£899 ex VAT)	£974.08 (£829 ex VAT)	£996.40 (£848 ex VAT)	£994.44 (£846.33 ex VAT)
Processor	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Cyrix 6x86 133
PCI slots	3	3	3	3	3
ISA slots	4	4	4	4	4
Shared slots	1	1	0	0	0
Motherboard manufacturer	Abit	TMC	KTX	Protac	Abit
Motherboard model	PR5	PCI ISTV	8500	MB 75-200	Triton III
Chipset	Triton 430VX	Triton 430VX	Triton 430VX	Opti Viper	Triton 430VX
No. of spare 3.5in bays	1	1	1	2	-
No. of spare 5.25in bays	1	1	2	1	2
Hard disk					
Manufacturer	Seagate	Quantum	Seagate	Seagate	Quantum
Model	ST31276A	Fireball 1280 AT	ST31276A	ST51270A	Fireball 1280 AT
Size (Gb)	1.3Gb	1.2Gb	1.27Gb	1.2Gb	1.2Gb
Interface	EIDE	EIDE	EIDE	EIDE	EIDE
Average access time (ms)	12	11	11	10	11
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max. RAM	128Mb	128Mb	128Mb	128Mb	128Mb
RAM type	EDO	EDO	EDO	EDO	EDO
Secondary cache (Kb)	256	256	256	256	256
Max. secondary cache (Kb)	512	512	512	512	512
Cache type	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst
Multimedia					
CD-ROM manufacturer	Hitachi	Acer	Mitsumi	Goldstar	Hitachi
CD-ROM model	7930	10x/Zuego	FX810	GCD-R54C	CDR 7930
CD-ROM speed	8x	10x	8x	8x	8x
Sound card manufacturer	BTC	Creative Labs	KTX	Advance Logic	Aztec
Sound card model	16-bit	SoundBlaster Vibra 16	16-bit Sound Adaptor	ALS Sound Card 16-bit	16-bit B&P
Graphics					
Graphics card manufacturer	miro	TMC	Diamond	Cirrus Logic	Spitfire
Graphics card model	2Mb DRAM 64-bit	S3 DRAM	Stealth 3D 2000	5434 PCI	1Mb PCI
Graphics card RAM/Max. RAM	2Mb/2Mb	1Mb/2Mb	2Mb/4Mb	1Mb/2Mb	1MB/1Mb
Monitor manufacturer	CTX	AOC	KTX	Videal	Samtron
Monitor model	1451C	4V	XPM-1000	PV 1564A	SC-428
Monitor size (inches)	14	14	14	15	14
Monitor NI refresh at 800 x 600	72Hz	72Hz	72Hz	100Hz	60Hz
Other Information					
Modem included?	❍	❍	❍	●	❍
Modem speed	-	-	-	33.6Kbps	-
Speakers	Juster Multimedia	Juster Multimedia	Arowana	Arowana	JS Jazz J201
Software supplied	TopLevel Complete Works	❍	Mechwarrior II, Pitfall, Earthworm Jim, Lotus SmartSuite 96	Lotus SmartSuite	MS Entertainment Pack
Standard warranty	3-yr RTB	5-yr RTB (1st year) parts and labour)	2-yr BTB	1-yr on-site	5-yr BTB. 1st yr parts & labour; last four years labour only
Warranty options	On-site	❍	❍	3-yr on-site	2nd & 3rd yrs on-site
Tech support line	●	❍	●	❍	●
Fax support	●	●	●	●	-
Company turnover *	£1m	n/a	n/a	£8m	£5m
Number of staff	7	6	20	63	21

KEY

● Yes ❍ No * (most recent figures available)

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Table of Features

Manufacturer	Innovations Direct	Paragon Computers	Roldec Systems	Stak Trading	Tiny
	Personal Computer World Highly Commended			Personal Computer World Editors Choice	
					
Model	ID 3D2000 P133	Intel P133	Roldec Pro P133	Diamond Discovery	P133 Multimedia System
Tel No.	0181 923 6666	0181 478 8700	01902 456464	01788 577497	01293 821333
Fax	0181 923 6655	0181 478 0001	01902 452592	01788 544584	01293 822514
Price	£1,056.33 (£899 ex VAT)	£880.08 (£749 ex VAT)	£998.75 (£850 ex VAT)	£998.75 (£850 ex VAT)	£962.33 (£819 ex VAT)
Processor	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	Intel Pentium 133	AMD PR133
PCI slots	3	3	3	4	4
ISA slots	4	4	4	3	3
Shared slots	0	0	1	0	1
Motherboard manufacturer	Protac	Intel	Abit	Ten Technologies	Tiny
Motherboard model	MB5200	Intel Pentium VX	PN5	PT-2006	Spear SR-M504
Chipset	Triton 430VX	Triton 430VX	Triton 430HX	Triton 430VX	Triton 430VX
No. of spare 3.5in bays	3	1	1	1	0
No. of spare 5.25in bays	1	1	1	2	1
Hard disk					
Manufacturer	Quantum	Seagate	Quantum	Western Digital	Fujitsu
Model	QBF 1280 A	ST31276A	Fireball 1280 AT	Caviar 21600	M1636
Size (Gb)	1286Mb	1.2Gb	1.2Gb	1.6Gb	1.3Gb
Interface	EIDE Mode 4	EIDE	EIDE	EIDE	EIDE
Average access time (ms)	15.5	11	11	11	11
RAM and Secondary Cache					
Main RAM	16Mb	16Mb	16Mb	16Mb	16Mb
Max RAM	256Mb	128Mb	128Mb	128Mb	128Mb
RAM type	EDO	EDO	EDO	EDO	EDO
Secondary cache (Kb)	256	256	512	512	256
Max. secondary cache (Kb)	512	512	512	512	256
Cache type	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst	Pipeline burst
Multimedia					
CD-ROM manufacturer	Hitachi	Samsung	Samsung	Creative	Goldstar
CD-ROM model	CDR 7930	SCR-830E	SCR-830	SCR-8300c	GCD-R580B
CD-ROM speed	8X	8x	8x	8x	8x
Soundcard manufacturer	Flagpoint	Opti	Creative Labs	Creative Labs	Crystal
Soundcard model	FPS E1868	16-bit SoundBlaster compatible	SoundBlaster Vibra 16	SoundBlaster 32 PNP	Crystal 16
Graphics					
Graphics card manufacturer	Diamond	Sigma Design Magic	Diamond	Videologic	Videologic
Graphics card model	Stealth 3D 2000	TR10 64V	Stealth Video 2500	Grafixstar 400	Grafixstar 400
Graphics card RAM/Max. RAM	2Mb/2Mb	1MB/2Mb	2Mb/2Mb	2Mb/2Mb	2Mb/4Mb
Monitor manufacturer	Iiyama	Targa	Princeton	ADI	Samsung
Monitor model	MF8515F	M145 PNLD	E040	Provista	SM483C
Monitor size (inches)	15	14	14	14	14
Monitor NI refresh at 800 x 600	100Hz	75Hz	72Hz	72Hz	72Hz
Other Information					
Modem included?	❍	❍	❍	❍	❍
Modem speed					
Speakers	Labtec LCS950	Juster Elite	Juster Multimedia	Creative CS120 Speakers	Unbranded
Software supplied	❍	❍	Lotus SmartSuite 96	MS Encarta 96, Actua Soccer, Disney's Toy Story, and the Hunchback of NotreDame	MS Works & Money, MS Encarta 96, Havoc, Dangerous Creatures, Mechwarrior, Terminal Velocity, Actua Soccer
Standard warranty	5-yr RTB	3-yr RTB (1st, parts & labour; 2nd & 3rd, labour). Free lifetime technical hardware support	2-yr RTB	1-yr RTB	1-yr BTB
Warranty options	Advance replacement	3 years on-site	1- or 2-year on-site options	❍	1, 2 & 3 yrs on site
Tech support line	❍	●	●	●	❍
Fax support	●	●	●	●	●
Company turnover *	n/a	£3m	£7.5m	£8m	£100m
Number of staff	n/a	9	51	25	330

KEY ● Yes ❍ No * (most recent figures available)

Money talks

James Taylor looks at choosing small-business accounting software and reviews ten packages.

Once, it was clear cut: large corporations used large corporate software at large corporate prices. One-man businesses made do with a cheap, cashbook-only, program. Small businesses could use a mid-range, integrated package. All three categories of software are still available but the distinctions have become blurred.

The idea of what constitutes a mid-range package is now quite elastic. On a comparison of features, several packages thought of as being at "entry level" are capable of providing all the accounting functions needed by small businesses. Competition among mid-range, integrated software can only widen the choices available, eating into the position hitherto held by the modular systems.

The cost of computerising your accounting functions can be held down if you forswear Windows and choose DOS-compatible software. Accounting is one of the last bastions of DOS computing, with plenty of products available.

We are concerned with software which has some pretensions to business accounting. All the packages reviewed here offer the facility to record income and expenditure, and allocate them to various headings or accounts. All allow you to produce management information and statutory accounts. Most add further functionality for day-to-day operations. Most software lets you choose your own accounts headings for analysis, and some even includes typical details for broad categories of business, as well as forms of business like partnerships or limited liability. So read on to see just what is available.

Accounting software
Contents

Ratings

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

Illustration: AMANDA HUTT

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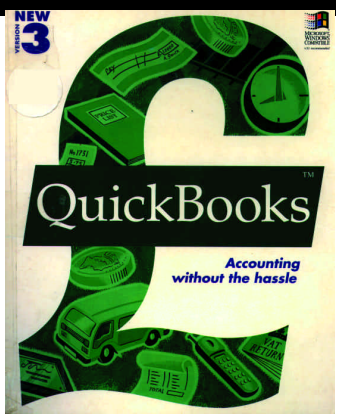
Choosing the right package

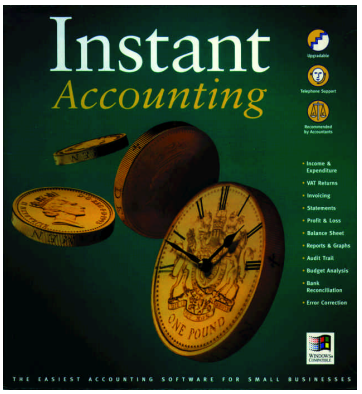
Most accounting packages will accommodate the different forms of business — sole trader, partnership or limited (corporate) company, although it's worth checking that software of foreign origin has been endorsed by UK legal and taxation specialists. The accounting software trade organisation is BASDA, which may be able to advise you.

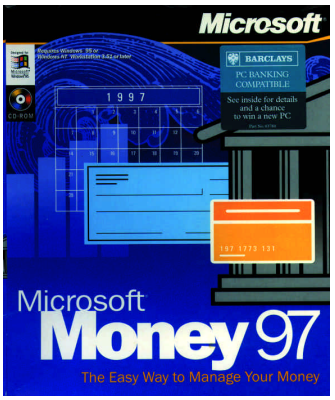
■ Ask your accountant's advice: if your accountant is an ICAEW member you might be able to benefit from special offers on software or training.
■ Base your selection on ease of use and features for your business, remembering that price is not necessarily an indication of suitability. Get a demonstration disk, if available.
■ Draw up as complete a specification as you can. The cost of software is nothing compared with the time it can take to set it up properly and you only want to do it once. If you only use a cashbook, don't buy a multi-module major package. On the other hand, don't reject fully-featured software if it's easy to use — you can always ignore the bits you don't need.
■ Almost all programs can account for VAT, but it's worth checking if you want to operate VAT cash accounting or are involved with any of the special schemes or sales in Europe.
■ Make sure the nominal ledger gives you enough different categories (like sales, travelling, or telephone) to analyse your expenditure and income in sufficient depth.
■ Some software lets you carry out secondary analysis, such as allocating sales by territory or expenditure by executive. All software should provide an audit trail.
■ Not all accounts software offers a stock-control function, so if you keep stock this could limit your choice. A good stock-control module will enable you to list stock items, quantities, re-order levels, prices and discounts and allow you to reserve, use, or replace stock.
■ Consider whether you need sales-order or purchase-order processing — not the same as the sales/purchase ledgers. These functions allow you to generate instructions to your works/stores or other departments or to your suppliers, linking to your ledgers and stock-control module as appropriate. Some sales-order routines will make up final assemblies, or at least picking lists, from stock components and automatically generate invoices.
■ Not all businesses have the same operating priorities, which is why not all accounting programs offer the same range of features. Among some of the additional facilities variously available are:

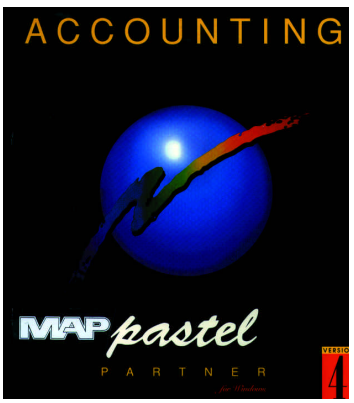
- Fixed asset recording/ depreciation
- Variable accounting periods
- Retail or POS routines
- Job costing
- Cash-flow forecasting
- Loan calculations
- Budgeting
- Bank interest checking

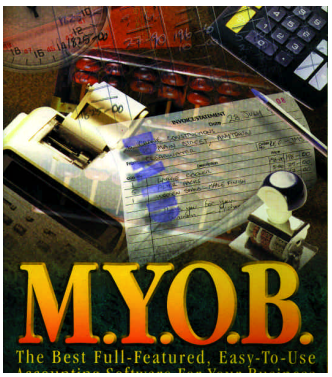
These functions can also be found on separate programs, which may be standalone and/or may integrate with the major accounting packages.











Glossary of accounting terms

• **Accrual VAT accounting** — The normal method of accounting for VAT whereby the VAT is due as soon as your invoice is issued, whether or not you have been paid by your customers. VAT on purchases can also be offset as soon as your suppliers' invoices arrive.
• **Aged balances** — Unpaid invoice values, grouped according to how long they have been unpaid, as an aid to chasing settlement.
• **Audit trail** — A list of all the transactions making up a set of accounts, errors included. Ideally, it should not be possible to delete or edit any entries.
• **Cash VAT accounting** — An alternative method of accounting for VAT, whereby the VAT is only paid once you have been paid by your customers. Of most use to a business which offers credit terms to its customers. VAT on purchases is also deferred until you pay your bills.
• **Cash flow forecast** — Predicted income, expenditure and calculated balances for a future period.
• **Corporate organisation** — A business trading as a limited company (Ltd or Plc), as opposed to a sole trader or partnership, and which exists in its own right.
• **Integrated package** — Software in which all functions are provided in one program.
• **Modular package** — Software in which different functions are provided by different "add-on" modules.
• **Nominal ledger** — Where all accounts information is stored, analysed by user-defined categories of income, expenditure, equity and so on.
• **Period end** — A convenient time to "close" the books in order to consolidate that period's trading figures: typically, at year-end and month-end, the latter being optional in many packages.
• **Purchase ledger** — Where expenditure is recorded, usually by supplier, then by invoice. May also be analysed by categories of goods or services.
• **Report** — A listing produced by the program detailing aspects of your business accounts, such as sales, purchases, bankings and balance sheet, usually at period end.
• **Sales ledger** — Where income is recorded, usually by client and then by invoice. May also be analysed by categories of goods or services.

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Personal finance software

A few years ago, when people were asked what they thought they might use a PC for, a common answer was: "To reconcile my cheque book." And indeed, such was the development of consumer software then, that this was all the available software could handle. You paid out half a week's wages for a program that let you enter a date, cheque number, a very brief comment and the amount, and the computer gave you back a list to check against your bank statement.

A few years on, it's no longer half a week's wages but can nevertheless amount to a significant sum. The software still lets you reconcile your cheque book but incorporates a bit more functionality, too.

One of the principal improvements, mostly due to the Windows graphical screen, is the ease of entering information in a familiar column format (payments, deposits and balance) while simultaneously viewing previous entries for verification. Usually the "transfer" of money to both the payee and the expense category is eased by using an on-screen representation of a cheque book. This makes keeping the data up to date less of a chore. And of course, it's only after you have built up a personal financial history that you can use the software to analyse past patterns and make any worthwhile forecasts.

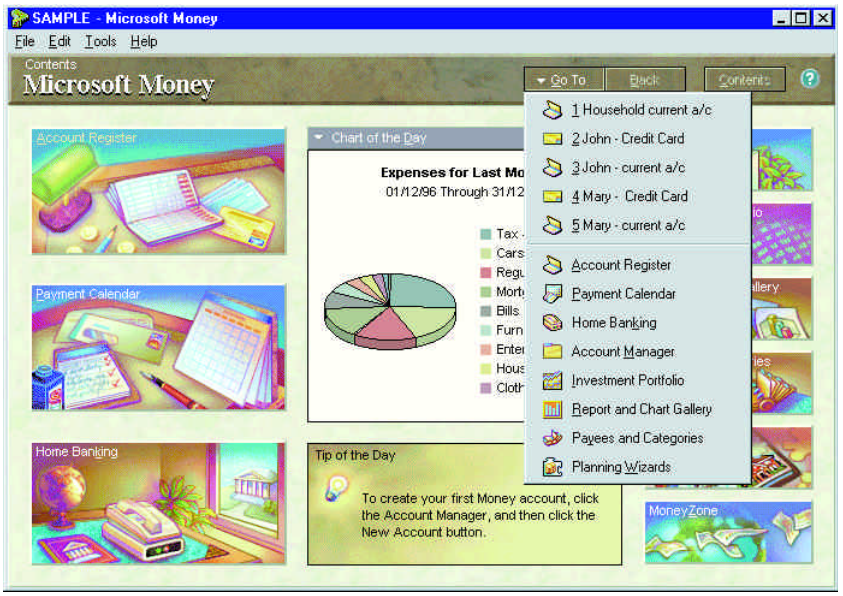
The other principal advantage is the capacity to use several different accounts at once, including different forms of income. You can therefore keep track of your current, savings, deposit, credit-card, loan and building-society accounts simultaneously, with the better software being able to consolidate these and other figures like your fixed and current assets, to calculate your net worth. Current assets are things you own and can quickly convert into cash (like jewellery), while fixed assets are things you own but can't convert quickly (such as your house).

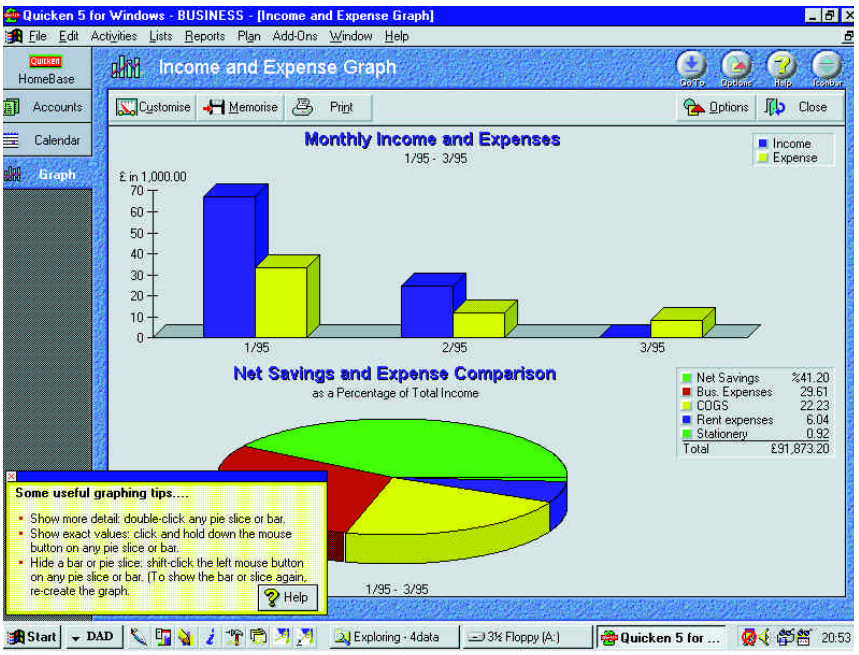
Many of today's personal-finance programs are cut-down versions of small business-accounting software. They incorporate business features like dozens of category codes enabling you to closely analyse your expenditure. They may also have a VAT tracking facility which is useful for micro-businesses, clubs and so on, which don't need full three-ledger accounting (even though it's there, lurking under the structure). If you're just starting out as a sole trader, such an inexpensive package might be all you need initially, after which you'll know a lot more when you come to choose a bigger system.

Other facilities available include standing orders, direct debits and post-dated cheques. You can also set up budgets against which you can judge your expenditure, forecast cashflow to see when you'll be able to afford that new Corniche, estimate your tax liability and evaluate loan proposals.

Some programs have particular features exclusive to them. Microsoft Money 97, for instance, offers online access to your bank via its Home Banking facility. At the moment, only Barclays is included and its service is only just due to be launched. Barclays' customers with Money 97 will be able to carry out assorted financial transactions from home.

Quicken has its own exclusive feature too, at least in its deluxe Home Pack version. With its home inventory you can keep detailed records of your possessions, noting down purchase prices and replacement values: useful in the event of a robbery (unless your computer is stolen), the list can be imported into the Quicken personal-accounts program as a record of your assets.





Above Even if you're not interested in home banking, Microsoft's new Money 97 has a lot to offer

Left Some software (this is Quicken, illustrated) is equally adaptable as either personal or simple small-business software

PCW Details

A selection of personal finance software

- **Money Manager Personal Edition** (DOS)
  Price £39.95 (£34 ex VAT)
  Contact Connect Software 0181 743 9792
- **Quicken deLuxe Home Pack** (Win3.x)
  Price £69 (£58.72 ex VAT)
  Contact Intuit 01932 2578501
- **MS Money 97** (Win95)
  Price £30 (£25.54 ex VAT)
  Contact Microsoft 0345 002000

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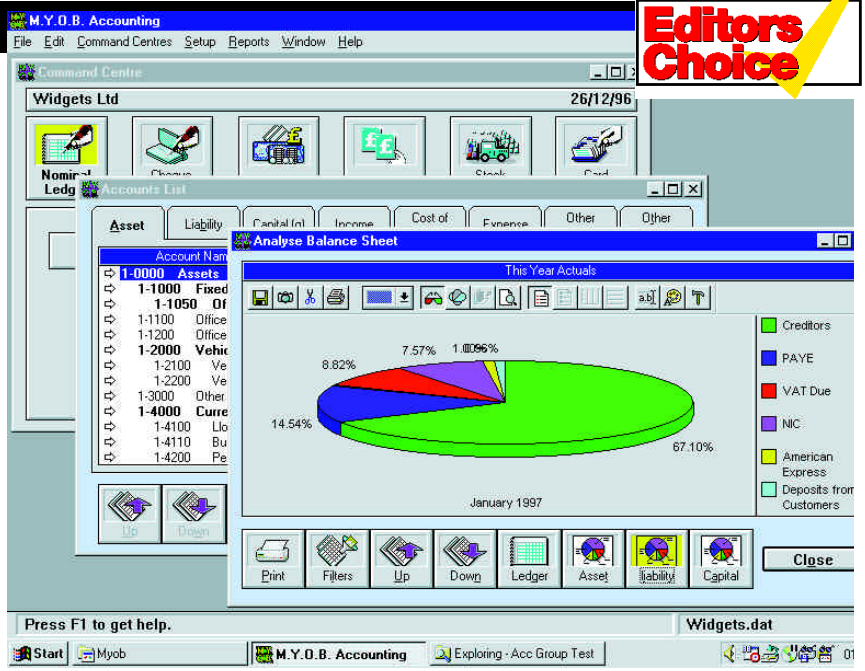
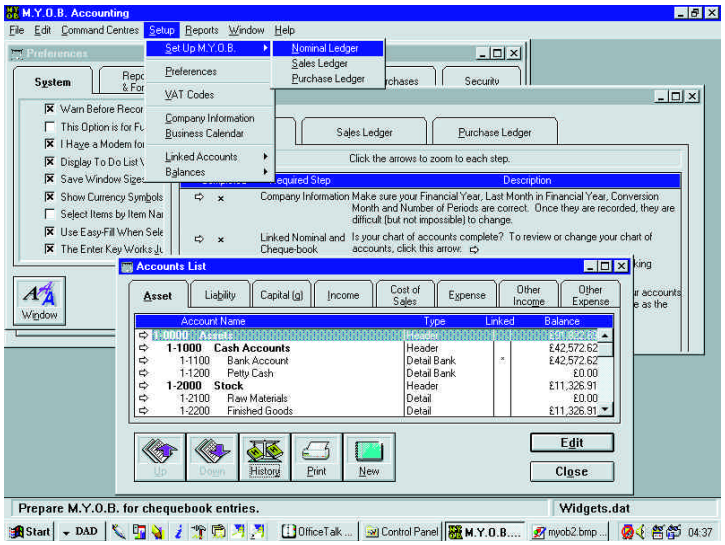
M.Y.O.B v6





Above There's more than one way to view MYOB's data, including drill-down

Left MYOB can be extensively customised to suit your way of working

This is the brand-new version 6 of M.Y.O.B. Yes, it does stand for "Mind Your Own Business" and yes, it is a silly name. The software itself, though, is very serious. It's a full three-ledger system: nominal, sales and purchase, offering integrated double-entry accounting. These three ledgers, plus stock control, a card file of addresses and your cheque-book records, form the main modules of the system. There's a "Command Centre" interface (context-sensitive hierarchical flow chart) to help you navigate, but the standard Windows menu is still there if you prefer this.

Among the enhancements to version 6 are options to customise reports: to select which fields appear on the report, to drag and drop fields into a preferred order, to add colour (displaying negative numbers in red, for instance) and to drill down to the details. There's also a new job-management facility whereby jobs can be organised under job headers and details, and include important information like start and completion dates, project manager and client contact. Reimbursable expenses can be linked to specific jobs and even invoiced automatically.

Other additions include cue cards to hold your hand through some of the less frequent and trickier transactions like dealing with bounced cheques, importing data from Quicken and exporting data to spreadsheets and word processors.

Otherwise, it's business as usual. The nominal ledger offers eight types of account: asset, liability, capital (or equity), income, expense, cost of sales, other income and other expense — that should be sufficient. There are also up to four levels of account nesting, each level linked to the one above, giving you plenty of categories with which to closely analyse your figures. Help in choosing your initial list of accounts is facilitated by about a hundred pre-defined sets, ranging from freelance writers to funeral directors, from computer dealers to cobblers (or should that be cobblers to computer dealers?) or you can define your own. It also knows about VAT cash accounting. Updating is instantaneous and compulsory, so if you need to operate batch posting, this is not for you.

The sales ledger lets you assign both default and customer-specific credit terms, and you can, if you so choose, calculate and impose finance charges on overdue accounts. As well as invoices and credit notes there are "pending" or pro-forma invoices, the issue of which has no effect on ledgers or stock and so can be used as quotations or acknowledgements. As well as opening individual customer accounts, you can establish any number of jobs for each customer, each job's income and expenditure being separately tracked.

Purchase orders can be formatted for goods, services or "professional" layout. Stock control is handled automatically, stock levels (and values) being reduced as you invoice sales and increased as you send out purchase orders. And you can adjust stock manually to accommodate those inevitable stock-taking discrepancies. All stock can be individually priced (at cost or selling price), although you can override those figures for individual transactions. Stock items can be grouped together to allow automatic parts assembly.

M.Y.O.B incorporates a record card file for customers and suppliers which, together with its To-Do List, gives you simple contact management albeit at a level of sophistication equal to that of a real card index. You can assign up to ten single-letter identifiers to a card, enabling you to categorise your contacts for anything from credit control to sales prospecting. You can make notes of your conversations and set a follow-up date.

Should you make a mistake entering data, you can rectify it seamlessly as long as it hasn't yet been saved, but if it has there's a routine for that, too. It is easy to access detailed information using drill-down techniques, right back to the original entry if necessary.

M.Y.O.B comes with a full complement of reports (about 100), which include customer/transaction histories allowing you to analyse and list everything you need to know about your business. Reports, together with invoices and their derivatives, statements, purchase orders and cheques, can be customised for fonts, fields and layout. This is particularly useful if you elect to print on plain paper or on your own letterhead, instead of the pre-printed M.Y.O.B forms.

PCW Details

Price £229 (£194.89 ex VAT)

Contact Best!Ware UK 01752 201901

Good Points Childishly easy to use without forfeiting sophistication.

Bad Points Nothing obvious.

Conclusion A big-business accounting system at a small-business price.

★★★★

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Pegasus Capital

Pegasus is one of the UK's major publishers of accounting software, perhaps better-known for its corporate-level modular systems. In Capital, it looks as if the company may have introduced its own competitor for the lower reaches of that market. Capital is not as well-specified as, say, Senior, but it does pack a lot of the average modular package's essential functionality into a relatively inexpensive, integrated system.

Running under Windows, Capital offers the usual sales, purchase, and nominal ledgers, cash book and invoicing, and there is stock control together with sales-order and purchase-order processing. Capital makes claims to no particular small-business niche, being configurable for product and/or service businesses, and it accommodates sole traders through partnerships to limited companies. In response to customers' demands, the sales ledger in the latest version now supports up to £9,999,999.99 on a single paying-in slip and bank reconciliation handles £99,999,999.99 (we should be so lucky!). The package can also offer a choice between 12 or 13 accounting periods in a year.

A Set-up Wizard helps you create an appropriate set of accounts for your particular circumstances, which you can modify, including nominal accounts and analysis codes. Day-to-day transaction facilities include postings for invoices, credit notes, receipts and payments. Files are updated as soon as postings are made so enquiries, which include routines to view account balances, stock levels and other business information, always show the up-to-date situation. Batch processes take care of such periodic functions as automatic purchase payments, while items like standing orders and direct debits are looked after by a recurring journal update function.

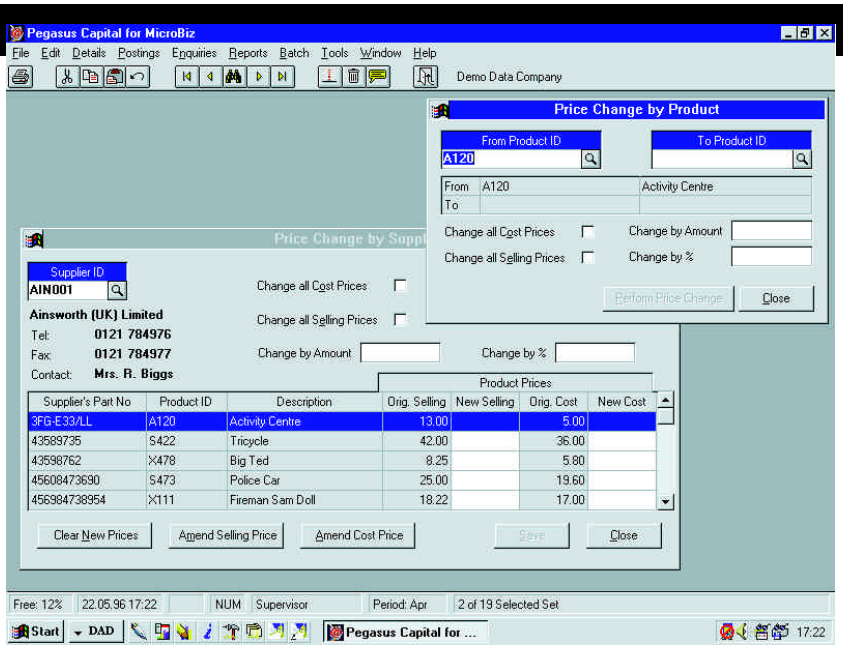
One of Capital's less usual (in this price range) but more welcome features is sales-order processing. This facility, which stores and processes details of sales and purchase orders from reception to despatch and invoicing (however long that may take) is particularly useful to contracting, manufacturing and similar organisations whose projects may run for a long time and involve considerable mass. Most of the information needed can be entered from your customer's order, and if it is a previous customer, Capital will add information from the customer-account record, including credit limit and current balance. It also automatically allocates the next sales-order number, notes the date on which the goods are due to be delivered, and remembers any settlement discount already agreed as well as any overall discount to be applied to the whole, and the carriage details. You receive a stern warning if you try to release sales orders when the relevant customer account is on hold, over its credit limit or about to exceed it.

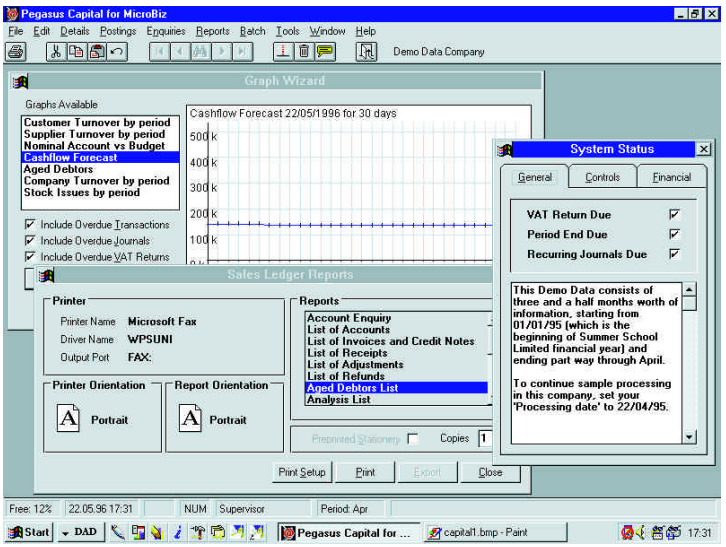
When you come to total the items ordered, the program retrieves all the relevant product information including stock levels, description, price and customer line discount. The order totals already include any carriage charge which has been entered. The program checks stock levels and advises you if they drop below critical levels. Printing an invoice automatically updates the ledgers with the invoice details, including the customer's account and the relevant accounts in the nominal ledger.

Reporting facilities include options to print and view reports and to export information to spreadsheets or word processors. Cashflow forecasts, aged debt, customer, supplier and product turnover can be illustrated by one of the built-in graphs and exported to your word processor. Plus, there is a VAT Return option to calculate and print your VAT100 form.

Pegasus runs its own software and book-keeping training courses at various UK regional centres, or you can buy training from authorised, independent Pegasus trainers. Service Cover provides you with telephone support direct from Pegasus and your first 90 days are free.

There's a lot in Capital for small- to medium-sized businesses with manufacturing or contracting interests. When things get too cramped, there's an easy upgrade path to the (DOS) Opera software by the same publisher.





Above All Capital's operating records are easily changed to reflect new conditions

Left Capital's on-screen information includes the Status display which gives you a picture of your business balances, at a glance

PCW Details

Price £646 (£549.78 ex VAT)

Contact Pegasus Software 01536 495200

Good Points Almost everything the average small business needs in accounting functions.

Bad Points You need a basic grasp of accounting first.

Conclusion A versatile accounting suite, particularly cost-effective for those who need sales-order processing.

★★★★

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QuickBooks v3

The best-selling QuickBooks is a basic three-ledger double-entry accounting system, although it's deliberately designed so non-accountants won't know that. It avoids those terms, as it does words like debit and credit. The sales ledger becomes "accounts receivable", the purchase ledger becomes "accounts payable". This will suit those who are not, and don't particularly want to be, accountants. Money to be paid out is entered on an on-screen representation of a cheque (as is cash paid out which, initially, can be confusing). Invoice details are entered into fields laid out as the paper form.

Invoices and purchase orders can make use of goods or service item descriptions pre-defined by you, and include all the necessary VAT categories and analysis codes. All the usual nominal analysis codes are possible: on setup you can choose from over 20 pre-defined sets, depending on the type of business you run. You can, of course, add and amend. Invoices may not only be issued to particular clients in the usual way, but also against specific jobs for that client. Three different invoice layouts (professional, service and goods) let you add, drop or rename fields until the information on the form is exactly what you want. You can do the same thing with cash-sale receipts, credit memo forms and purchase orders.

When invoices haven't been paid by the due date, you can add finance charges, choosing your own percentage interest rate or charging a fixed sum. Although everyone *says* they want this facility to penalise late payers, few seem to use it when they've got it.

Your "cashbook", which includes income and expenditure, both in total and analysed, is listed in QuickBooks' Registers, which is searchable by date and amount. It can also be interrogated using drill-down and can be directly edited. You get a separate register for each bank/cash account, which shows your balance too. Additionally, there is a separate Reminder window which can be set to appear on startup, showing your bills and invoices due.

Payments, in and out, in settlement of outstanding bills or invoices can be applied to specific outstanding amounts. As well as settling bills in this way, you can also record other cash and cheque payments, either against the cheque number or a voucher reference. After incoming payments have been allocated to particular invoices, you can record your banking deposit against your paying-in slip number, so everything is easily traceable.

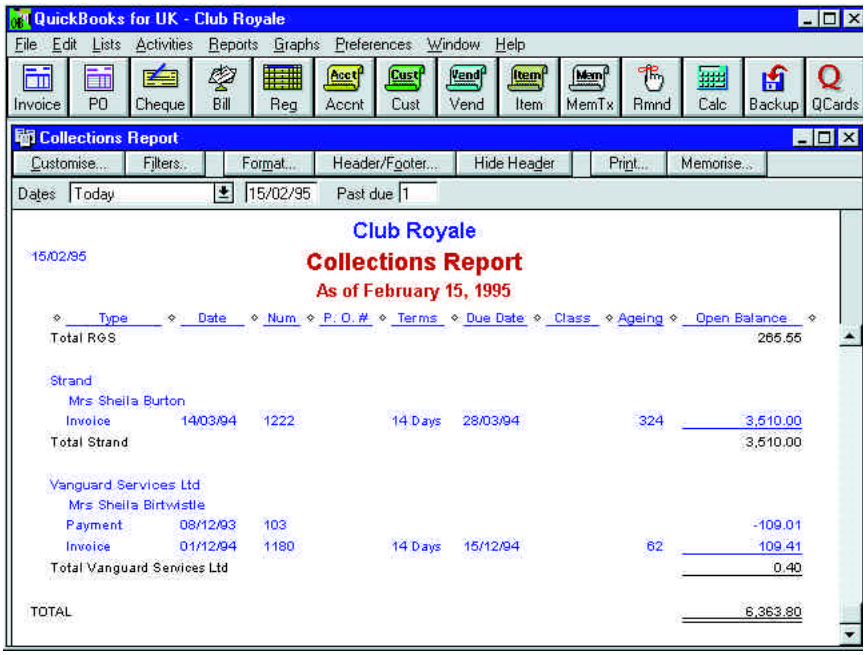
QuickBooks includes an integrated stock-control and stock-reporting facility which, when active, gives you a "stock part" item category which you can increase by making purchases and decrease by making sales. There is no "parts explosion" facility but you have the option to turn stock control off, when it reverts to being an equally useful Invoice Item which can be applied to service invoices.

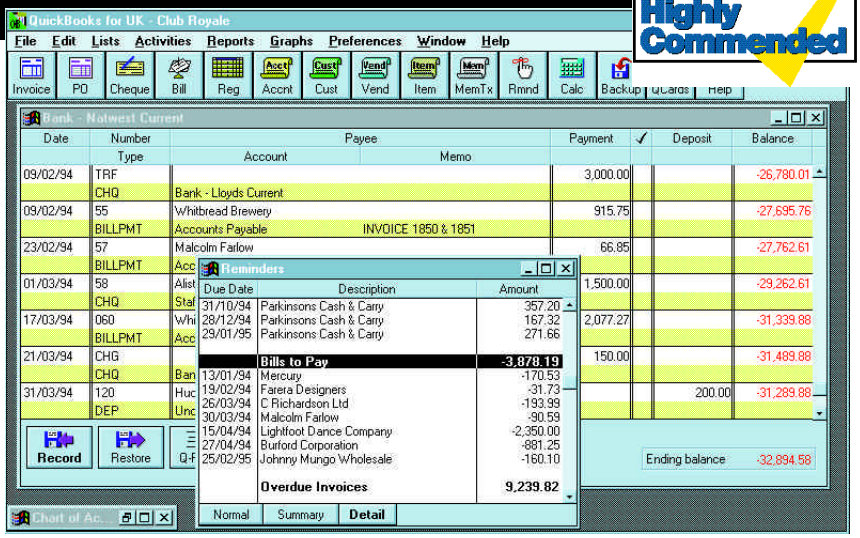
Another optional feature is the audit trail which is implemented so that the original entry and any subsequent changes appear on the list together. You do not have to use it if you don't want to, but if you do it is password protected against disablement.

Monthly accounting and management information reports are predefined but you get a wide variety of options. Sales report, for instance, can be listed by item, by customer or by sales area or representative. Management reports include cashflow forecast, project or job reports and missing cheques, as well as the usual profit and loss, balance sheet and trial balance. Certain reports can be converted into graphs (which can be printed out) for a better appreciation of your finances.

You might find the monthly Collections report useful in that it analyses your invoices by their (variable) settlement periods to produce a list of what you can expect to receive and when, so you can phone your customers to find out why you haven't had it yet.

Together with its personal finance stablemate, Quicken, QuickBooks may fairly be said to have considerably influenced the market for "non-accountant" accounting software and it remains one of the best implementations of that philosophy. What's more, its price makes it doubly worth investigating.





Above The QuickBooks Register and Reminder keep you up-to-date with your finances

Left The QuickBooks Collection Report helps you chase your debtors

PCW Details

Price £146 (£124.25 ex VAT)

Contact Intuit 01932 578501

Good Points Extremely easy to use, with all the basic features.

Bad Points Probably won't suit an accountant.

Conclusion QuickBooks is a competent business tool which should be perfectly satisfactory for most small-business/sole-trader users.

★★★★

p168 ➢

Sage Instant Accounting

A careful mixture of old and new accounting practices, Sage's entry-level business-accounting software for Windows, Instant Accounting, retains some of the traditional accounting controls including an authoritative audit trail. Despite this, it makes useful concessions to non-accountants who are computerising their business for the first time and who probably make up its main market, by allowing easy, if limited, correction of mistakes (including the reversal of mis-postings) without resorting to double-entry ledger transfers.

Immediate updating of bank and other account balances is possible, but for companies where accounts are maintained by clerical staff who prefer to prepare invoices, credit notes and statements in batches (for later checking by senior personnel), this option is available too. Invoices generated by the system can be product or service-based, the latter accepting free text. Invoices produced manually, and already sent to your customers, can be logged at any time. Actually, you can periodically "clear down" Instant Accounting's audit trail, too, removing completed transactions (preferably having first taken a copy for your accountant).

The essential features on offer include sales and purchase transaction recording: cash and credit-trading facilities (including credit cards), cash and accrual VAT accounting, and financial and management reports. There is no stock control but you are unlikely to attempt to run a complex manufacturing operation on an £84 package. You can maintain a descriptive list of products, including pricing. This is then presented, during invoicing, as a drop-down list from which you can make your selection, knowing that the details will be accurate.

These days, a drill-down traceability facility is practically mandatory and Instant Accounting has one. You can analyse a transaction into the individual items that comprise it by double-clicking on a line of the report. This covers transaction activity reports for customers, suppliers, nominal or control accounts.

Equally useful, if you are not an accountant, are Instant's wizards which hold your hand through awkward, if little-used, procedures like transferring money from one bank, cash or credit-card account to another.

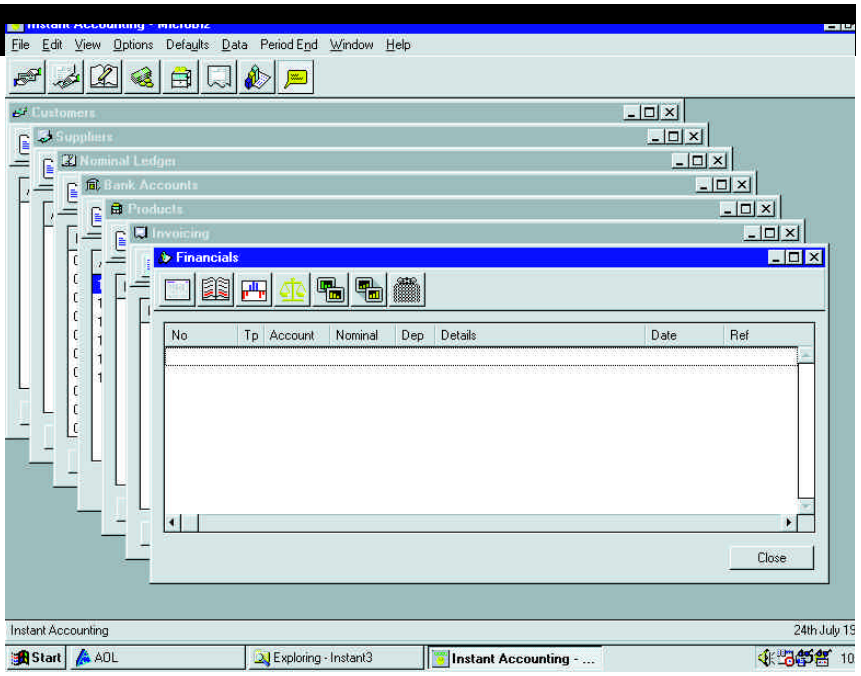
As with all Sage's products you get impressively versatile document-customising facilities, allowing you to produce invoices and reports on your own pre-printed forms, plain paper (laid out however you wish) or Sage-supplied stationery. Reporting content can be quite extensively customised for a product in this price range. You can decide which periods will be used in reports (either calendar months or the number of days), include transactions dated after the report date and automatically group consecutive transactions of the same type on your statements (for instance, those that share the same date or reference).

Transactions themselves can be assigned to up to 999 different departments and you get 999 different product categories for analysis purposes. You can also select report data using criteria you define yourself for such matters of interest as customers, suppliers, nominal accounts, product records and invoices. You can set up and save frequently-applied criteria for re-use. Instant Accounting will also write "begging letters" to your customers, asking to be paid, and you can mailmerge any fields in your records.

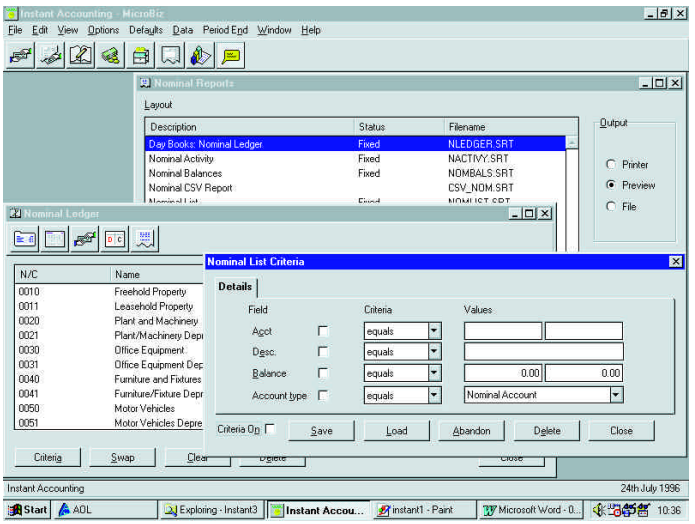
Data entry is aided by vivid representation of actual forms on-screen (an effect pioneered by Sage, but nowadays everybody is doing it), so, for example, payments are recorded on a representation of a cheque. The VAT calculation, too, is presented on a realistic-looking replica. Such familiar metaphors certainly make it easier for the novice.

Instant Accounting is one of the few packages to be certified by the Institute of Chartered Accountants in England and Wales. It also qualifies for free initial telephone support from Sage: on the box it states 30 days but we have been told 90 days.

When you are ready to upgrade, the recommended Sage upgrade path is to its own Sterling package which incorporates extra facilities such as stock control and order processing. And you may like to know that Instant Accounting shares its menu format and icons with Sterling for Windows.



Above Instant Accounting's interface is easy enough to use



Right Viewing and analysing your data can be carried out using your own selection criteria

PCW Details

Price £99 (£84.25 ex VAT)

Contact Sage Group 0191 255 3000

Good Points User-friendly interface. Versatile printed document layouts.

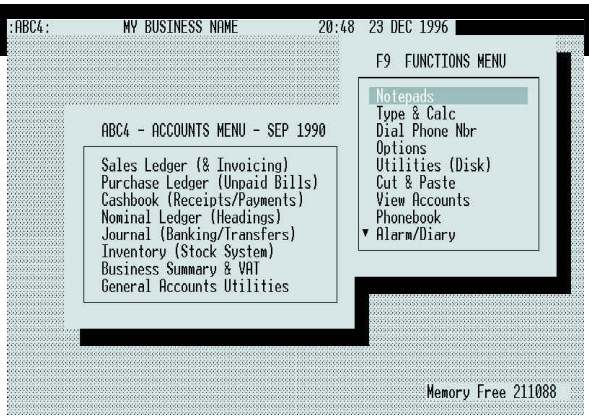
Bad Points No stock control, so not really suitable for manufacturing or distribution operations.

Conclusion Sage's baby business book-keeper makes a useful starting point for service-orientated businesses.

★★★

p175 ➢

ABC4



A practical suite of ancillary programs complements ABC's three-ledger accounting system

ABC4 is DOS software. It's unusual, coming complete with a "typing" module, a filing module and a spreadsheet: in fact, a simple office suite. The "typing" function is a basic word processor for letters, reports and quotations, "filing" is a simple flat-file database able to store, sort, select and print information, and "Calcsheet" is a basic spreadsheet, good for cashflow forecasts. There's a label printer and a phone book too.

Apart from mailmerge, an accounts-viewing window and a cut-and-paste facility, the separate programs offer only limited integration. Neither do they compare in sophistication with similar modules from the heavyweight office suites. But they do provide all the functionality that many small companies are likely to need. The biggest limitation is the small number of printers offered (four). True, you can edit or create printer tables, but these days you shouldn't have to.

The accounting function offers a three-ledger, double-entry integrated book-keeping system with sales, invoicing and credit notes, statements, cash, banking and VAT, plus stock control. There's a proper audit trail and formal period-end procedures. You get routines for nominal journal adjustments (transfers), bankings and reporting, including trading (P/L), balance sheet, VAT and aged debtors. There is also an option to use Cash VAT accounting.

Useful touches include a warning message if your customers exceed their pre-set credit limits (it can be ignored) and the facility to post-date your invoices. Individual invoices can be treated either as pre-paid or VAT-inclusive. In allocating money to invoices, you can choose to dispose of awkward balances by writing them off as discounts, saving many tedious journal entries.

As a mini-suite, ABC4 offers a more useful set of modules than the "big three" suites, although each section could do with more sophistication and, above all, integration. Nevertheless, it seems to have its share of satisfied users. There's an active user group and a periodic newsletter as well.

The combination of functions and presentation seems to aim the product at business people who don't necessarily like computers, so these people could be well advised to consider it. More experienced users might like to wait for ABC for Windows which is promised for some time this year.

PCW Details

Price £293 (£249.36 ex VAT)

Contact ABC Direct Sales 01257 480502

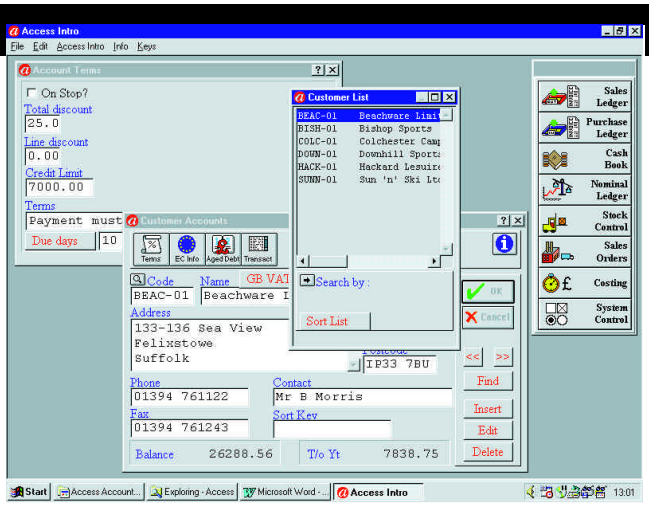
Good Points Frill-free and simple to use without stinting on functionality. Useful extra facilities.

Bad Points Help system could be better, some menu items could be less cryptic. No tutorial or demonstration data.

Conclusion Ideal for the computer-wary small business, especially if using older machines.

★★★

Access Intro



Flexibility in feature selection is a keynote of Access Intro

Access Intro, a cut-down version of the multi-modular Access v3, is sold only through dealers. The dealer will install it for you (for a fee), which is a good job because there is a cunningly executed deadfall which will absolutely guarantee the program won't run (it can be fixed by delving into the File Properties box). When you do get up and running, you'll probably find that the help file appears to be missing, too. These things do not make for a confidence-inspiring start, for owner-installer customers.

Access Intro gives you a standard three-ledger system (sales, purchase and nominal) with a cash book. Stock control, job costing and invoicing/sales-order processing can be had for more money, as can a multi-user licence and the facility to run more than one company or data file. These are not supplied separately but are "unlocked" from your original purchase.

The sales ledger offers the usual transaction recording, including invoices, credit notes and receipts, and you can define contract terms and EC VAT rate. If you want VAT cash accounting, there's a different version (at no extra cost). The aged debtors/creditors list can include several lines of information for each customer or supplier, plus all their outstanding transactions. You can also put defaulters on "stop" (you can't send goods or raise invoices).

As well as using the usual nominal accounts, you can analyse certain transactions by department and project. And when reconciling your bank account, you can reconcile any other nominal accounts too.

Sales orders are used principally to allocate stock and immediately generate documentation like despatch notes, picking lists and invoices, making the feature ideal for distributors. Contractors and bespoke manufacturers will find the project/cost centre facility in the costing module useful too.

Having the advantage of a low starting price, the fully expanded Access Intro is directly competing against the likes of Sage Sterling and should be useful to a wide range of businesses. It's just a shame about the imperfect conversion from its bigger brother.

PCW Details

Price £347 (£295.31 ex VAT)

Contact Access Accounting 01206 322575

Good Points Useful base module with pick-and-mix extras building up to a practical blend of features.

Bad Points Will defeat owner-installers, who will also be better with a little accounting experience.

Conclusion Traditional structure, ideal for accountants. Expensive unless you want most of the extras.

★★★

p176 ➢

Money Manager

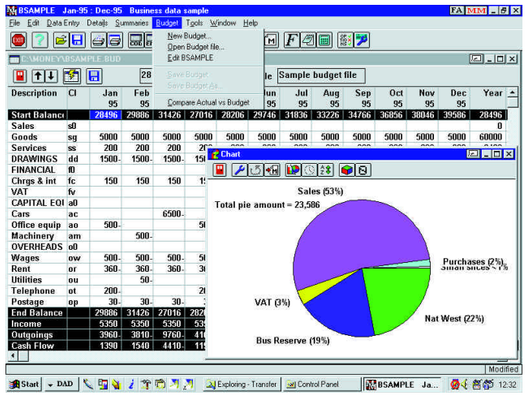
Money Manager for Windows Business Edition is now in version 5, so it must be doing it right. Also available to run under DOS, it's impressive software, particularly at the price, and especially when you consider that it's multi-company and multi-currency capable.

Money Manager certainly doesn't subscribe to the clean-screen philosophy and might be intimidating to computer tyros, especially non-accountants. It must be said, though, that half the screen is often occupied by a list of analysis codes (where others might favour drop-down boxes), faintly reminiscent of a DOS product. You can have up to 10,000 transactions per month, allocated between account codes, sub-account codes, class codes, and "mark" codes.

Account codes define your major "control" accounts like bank, cash and VAT. Sub-account codes refine these by identifying individual customers and suppliers. Class codes categorise expenditure or income, like machinery, stationery or salary, and let you analyse income/expenditure for particular classes. Mark codes are optional and useful labels which you can use to collate entries for further analysis such as separating petrol expenses between partners without having separate class codes. You get bank reconciliation, cheque printing on your own cheques and a good selection of reports.

You can, of course, enter invoice details but there's no invoicing in Money Manager itself (*see Case Study, page 183*) so it's use your word processor or look elsewhere .

Connect Software offers two add-on programs you might find useful. At £49.95 (ex VAT), Final Accounts for Windows adds end-of-period reporting: producing your trial balance, profit-and-loss report and balance sheet as well as looking after things like fixed asset depreciation, capital allowances and tax. When installed, it integrates with Money Manager (apart from having to switch menus) to provide a reasonably featured accounting system at a reasonable price. The other add-on is Office Manager, offering invoicing, a stock database, letter templates, contacts lists and more. But it runs under DOS only, which is a bit of a drawback for a Windows companion.



Money Manager gives you plenty of options for analysing your accounts

PCW Details

Price £94 (£80 ex VAT)

Contact Connect Software 0181 743 9792

Good Points High data-entries capacity. Multi-company.

Bad Points Potentially confusing screen layout.

Conclusion Flexible and versatile with excellent analytical features.

★★★

MAP Pastel Accounting

Now established in the UK under the MAP imprint, Pastel Accounting (as the former Pastel Partner would like to be called) has reached version 4.1a: version 4 is Windows-only and DOS users must continue to use version 3, which is both DOS and Windows.

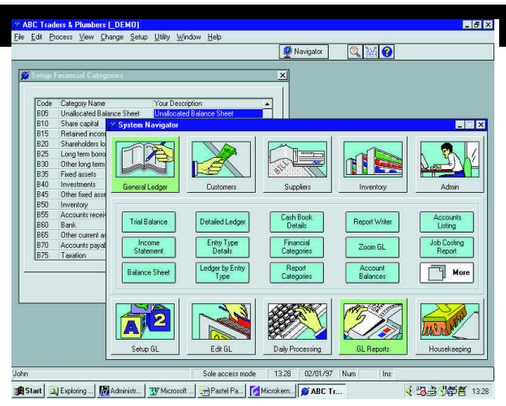
Among the changes in version 4 are improvements to the interface: customisable layouts including column positions in data tables, drill-down enquiries, better reporting and a remote monitoring program. Pastel is now multi-currency as standard, handling up to 16 currencies in addition to the pound.

Pastel owes much to traditional accounting practices like double-checking, batch updating and period closing. In addition to a general ledger, cash book, sales and purchasing ledgers, invoicing, job costing, budgets and a report writer, you also get up to ten cash books, up to 30 separate tax types and up to 32 types of entry. You can create purchase orders and supplier invoices, and prepare and process quotations and sales orders.

In the UK you also get Pastel's "manufacturing" module (an extra elsewhere) with bills of materials and parts build-up. A linked codes function brings up all the inventory codes associated with an invoice item — useful where given items are sold separately and in standard packs or assemblies. As well as inventory item codes, Pastel also handles bar codes and bin numbers for inventory items. Bills of materials can include labour and overheads as well as components by description and quantity, with Pastel calculating the finished cost, mark-up and selling price of the manufactured item. You can also break down a manufactured item, recreating the original component items.

You can't say Pastel isn't feature-rich. For instance, it has a special date-limited price list for seasonal items or special offers, individual prices for each inventory item (coded to individual customers) and multiple delivery addresses for each customer. You even get a card game, a puzzle and a doodle pad.

The manual, to quote Boswell quoting the 18th century Duke of Gloucester, is a "damned thick, square book" and all the better for it. And in addition to the normal help file, there's a Knowledge Base of tips and techniques.



Personal Computer World Highly Commended

Choose to navigate by Pastel's comprehensive System Navigator or the standard Windows menus

PCW Details

Price £469 (£399.14 ex VAT)

Contact MAP Computer Products 0161 624 5662

Good Points Arm-long features list. Multi-everything.

Bad Points Assumes some accountancy knowledge.

Conclusion A fully-featured system for almost any business as long as it has some accounting expertise.

★★★★

Sterling Financial Controller

Acknowledged as the largest British software company, Sage offers accounting software covering all sizes of business and most platforms. The Sterling range is no exception, boasting a progressive functionality, from Accountant at £350 through Accountant Plus at £500, to Financial Controller (£650) reviewed here.

For your money you get the usual three ledgers (sales, purchase and nominal) plus invoicing, sales and purchase-order processing, stock control, credit control, fixed asset management and a wide range of customisable management reports. There's a separate payroll program available for £300 (plus VAT).

You can link Financial Controller to Sage's own dedicated contact manager, TeleMagic, as well as to other business software like word processors, spreadsheets and databases. You can produce invoices (and credit notes) for goods or services, the first including quantities and rates. Raising invoices for stock items automatically updates stock control.

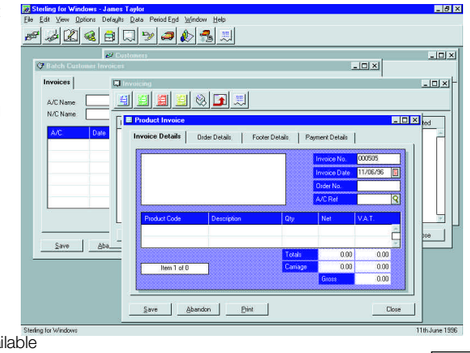
You get multi-company and multi-user flexibility and the package claims readiness for the year 2000 (but not for the euro). Batch invoicing, better drill-down, free text invoicing, and bank reconciliation are new features. You can analyse your invoice entries by user-defined tax, nominal and department codes either item-by-item or for the entire invoice. There are separate product categories, too.

To get the best out of Sterling you can (for a fee) take advantage of Sage's support and training services via a network of over 2,000 UK dealers providing specialist support for small- and medium-sized business customers.

Sage claims it will produce year 2000-compliant versions of all its Windows software packages during 1997, so make sure you get a current copy. This will include the Sterling range of accounting and payroll products, Sovereign for Windows, TeleMagic contact management software, and the Timeslips time and fee billing package.

All Sage business-accounting software products are accredited by the Institute of Chartered Accountants in England and Wales (ICAEW).

Sage set the standard for small-business accounting software and is a yardstick by which others measure themselves. Pricewise, particularly if you include support and budget for some training to make the most of its features, it starts to look a bit expensive.



Sterling's invoices can be entered from the keyboard or generated by the sales-order processing function

PCW Details

Price £763 (£649.36 ex VAT)

Contact Sage Group 0191 255 3000

Good Points Comprehensive and flexible. Excellent report and form layout formatting.

Bad Points May be overkill for many small companies. Benefits from some accountancy knowledge.

Conclusion If you need comprehensive financial controls, Sterling Financial Controller is one to look at first.

★★★★

TAS Books 2

There are two TAS Books programs. TAS 1 is the starter program with its three ledgers, cash book and invoicing. TAS 2 is the upgrade. Functionally it is identical, but adds sales- and purchase-order processing and stock control. Accredited by the ICAEW, it offers a drill-down facility to the ledgers and daybooks and there's a semi-automatic double-entry function plus more flexibility in handling recurring transactions.

The stock-control function can handle standard products, non-stock items, assemblies and consumables. Each item can be assigned a category, and there is support for serial- and batch-number tracking (essential if you operate quality control). You can monitor item movement history, stock valuation, stock levels and stock taking. Purchase-order processing handles over-deliveries and short-deliveries, including price and quantity mismatches, for contract and consumable materials. Stock records are automatically updated by the sales-order processing operation, which will also look after back-orders and negative stock.

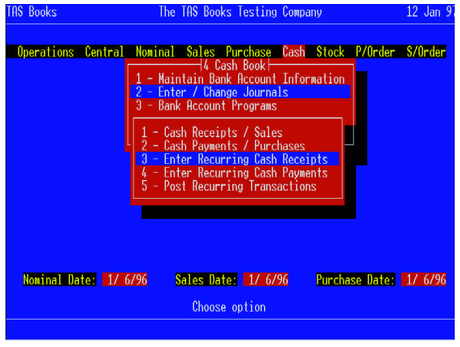
The order-processing function also generates quotations, pro-formas, order acknowledgements, invoices and credit notes. It gives detailed sales analyses by customer, product or salesperson. Sales-order (and purchase-order) processing automatically updates Intrastrat details if you deal with the EEC.

You can use up to eight rates of VAT and accrual and cash-accounting facilities. You can switch between them at any time or you can ignore VAT if you are not registered.

Although incorporating period-end procedures to advance your accounting year, TAS Books doesn't actually close off any transactions so you can bring up any item in detail from however long ago, thereby giving you the best of both worlds.

TAS Books runs under DOS, which partly accounts for obscure error messages: "Please run program 0.3.1" doesn't help if there's no clue to which one that is.

It cannot be denied that the swing is away from DOS, making TAS less likely to be acceptable to a first-time user with a new computer full of Windows software. Megatech's forthcoming version for Windows 95/NT may rectify that, promising a median between the functionality of TAS Books 1 and 2.



A wide-ranging feature set is available to users of TAS Books 2

PCW Details

Price £410 (£348.93 ex VAT)

Contact Megatech Software 0181 874 6511

Good Points Good range of facilities, coupled with traditional accounting procedures for those that need them.

Bad Points You really need to be an accountant to get the best out of it.

Conclusion Nicely suited to traditional accounting procedures, TAS Books 2 gives you a lot for your money.

★★★

p178 ➢

The desktop bank

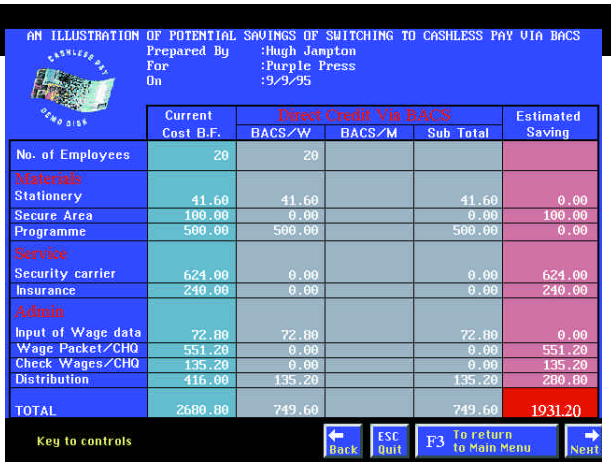
Online business banking has finally arrived: the ability to interrogate your bank account by computer and modem, pay cheques, change standing arrangements and order new services.

Over 68 percent of the UK's working population already benefits indirectly from BACS, a form of online banking. The Bankers Automated Clearing Services (also known as Cashless Pay, or Direct Pay, or Direct Credit) is the reverse of direct debit. Instead of giving someone your bank account number and authorising them to subtract unspecified amounts of cash from it, you give them your bank account number and let them put in unspecified amounts. BACS can be used to pay suppliers of goods and services, even occasional ones, but its main application tends to be in the administration of payroll, pensions and expenses. Its main benefits are reduced risk of robbery, prompt and regular wages payments (because they're automatic) and lower insurance premiums.

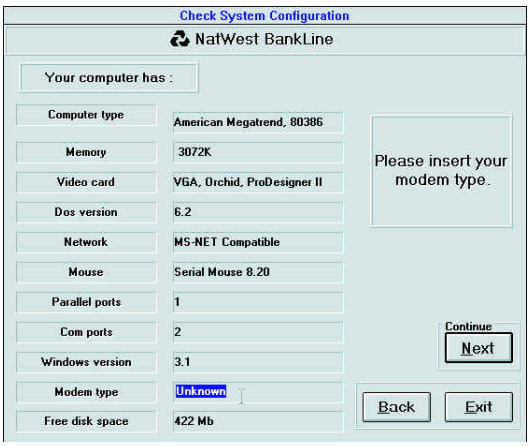
You need accounting software with a BACS capability and this tends to be the higher-priced modular systems (Global, MAP, Pegasus and Sage). Or, you can use a payroll bureau instead. BACS can supply leaflets and a demo disk, comprising a presentation and a benefits calculator.

For other services you should talk to your own bank. Lloyds Bank offers LloydsLink, which also lets you interrogate your bank accounts from your own computer. NatWest's BankLine Cash Manager service gives you access to your accounts from your own computer, plus a one-way email link to your "Relationship Manager". You can move sterling and foreign currency between your accounts, as well as making payments. You can also calculate projected cleared balances.

Right The Cashless Pay disk will prepare a savings estimate based on your own figures



Below NatWest's BankLine Checkout disk will verify your computer's compatibility



The Royal Bank of Scotland operates its Royline service, linking your computer to your bank. Royline lets you administer your own accounts as well as being able to transmit your payroll details to the bank on pay day. Other services include multi-account reconciliation reports and credit-card processing.

As well as standard BACS and its Mid-Tel phone transfers, Midland Bank has its Hexagon service for cash management between your own accounts, trade services (documentary credits) and market information. Like many others, Hexagon will start up your computer, unattended, and communicate with your bank at cheap off-peak times if required. Many of these services run independently of your accounting system, using software supplied by the bank.

■ *BACS 0800 191191*

Keeping up to date

As you will have noticed, there is much excitement about the implications for computer software come the turn of the century. The year 2000 date change has been described as a ticking time bomb which could completely wipe out your business unless you take steps to do something about it now. Yes, *you*.

Not only do you need to know that the integrity of your software is secure, but that your suppliers' software can be trusted, too. So start pestering.

The simplified explanation is this. Dating from the time when memory was not so readily available, programmers saved a couple of bytes on every instance of a date by assuming the century. Thus, 1996 is represented by 96 and 1999 by 99.

There is plenty of general information about the year 2000 on the internet, although the content is almost entirely American

When the millennium arrives, you might expect 2011 to be represented by 11, except that your software will think you mean 1911 and process accordingly.

Users of packages like those reviewed here will need to get a replacement from the publisher (but don't expect it to be free). That will take care of future entries but what about historical data, already sitting on your hard disk in two-figure format? If you sell date-stamped goods or services, you'll need to get it all converted to four figures. Start now. Your accounts data should be less of a problem because you'll simply close at the end of the year and treat it as historical. You'll have to carry over any time-sensitive entries when you start your new year, of course.

The table shows which packages are currently ready for the year 2000, although all publishers say, of course, that by the time 2000 comes, they'll be ready for it.

The other significant date you need to consider is earlier: 1st January, 1999. This is when, if all goes as planned, the euro will come into circulation. If the UK joins that dubious club, your accounts will have to be able to handle a dual base rate (the euro and the pound) and be able to trade in either. This is *not* the same as having a multi-currency capability. Read our Table of Features *(page 186)* to see which packages are ready.

Case Study: TAS Books 2 at Avery Dennison

Avery Dennison (Ireland) is part of the Avery Dennison Corporation, a leading labelling and stationery company. During the past two years, Avery's adoption of a just-in-time system for its warehouse operation coincided with the introduction of new accounting systems throughout the organisation, which together have provided some dramatic decreases in stock holdings. The accounting system chosen was TAS Books 2 by Megatech, and replaced a system based on an IBM System 36 minicomputer.

At its Dublin distribution centre, Avery has implemented all the system's modules including stock control, purchase-order processing and sales-order processing. At its manufacturing plant in Cork, a similar system manages an operation producing ranges of document folders and other products for the export market. At both sites, four-user Novell networked systems are used by sales, purchasing and warehouse staff as well as by financial management.

According to Frank Morrison, Avery Dennison's financial manager, who is responsible for both sites, the performance gain was considerable. "The report generator is powerful enough to produce all the information we want very quickly," he said. "In some areas of the business, resources tied up in stock have been cut by more than 70 percent. It is impossible to attribute savings to individual systems, but rapid access to sales and stock purchasing information, via TAS Books 2, plays an important part."

At the Dublin warehouse, managed by warehouse controller, Ray O'Brien, orders for replacement stock are automatically generated at pre-set stockholding levels. These "suggested orders" are then cross-checked with reports produced by TAS Books before issuing actual purchase orders to suppliers.

"We use Low Stock and Product Movement Reports generated three or four times a week as the basis for actual orders," explained Ray O'Brien. "But, by generating suggested orders, the system saves a considerable workload."

TAS Books 2 is unusual in that it has real-time stock control with sales-order information communicated to the stock control module at the end of each line of an order. Many other systems update the stock system in periodic batches or at the end of a completed order that may include dozens of items. Real-time operation is of particular value when telephone sales staff are competing for limited stock of the same item. Equally important is the facility to re-credit items to stock the instant an order is cancelled or altered, the salesperson simply hitting the cancel button to make that stock immediately available for other orders.

From the financial management point of view, Frank Morrison can quickly and easily edit existing transactions like mis-allocated figures, on the days he visits the Dublin site. "The Account Processor avoids the need for contra-entries, so it is quick, and accounts remain clear and uncluttered," he said. "This all helps to ensure that we can always get a clear picture of the situation." Once a change has been made, all other aspects of the accounts affected are immediately updated.

Avery Dennison discovered that learning to use TAS Books 2 proved relatively quick and easy for all levels of staff. To simplify its operation, the system is tailored so that operations staff only see that part of the system they actually use. ■

Case Study: The ABC of photojournalism

One Christmas, Tony Sleep was given a Box Brownie camera. Within weeks he'd taken a photograph which unaccountably turned out well and he has had the shutter-bug ever since. Not that he turned professional right away (he was eight years old at the time); he tried his hand at a variety of jobs before deciding to embark on a career as a freelance professional photographer.

Today, after the best part of two decades, he is a dedicated press photographer with an established clientele of magazine and newspaper publishers; mainly the specialist consumer and trade press. You'll find his work in motorcycle magazines, for example (he's a biker himself), medical journals, RNIB publications and the AA magazine. Based in London, he does editorial work for some charities and housing organisations. Most of his business comes from referrals and recommendations.

As a sole trader, with no employees and no statutory audit requirements, Tony doesn't need fully-featured accounting software. Nevertheless, he chose ABC. Tony's been using ABC for ten years now and likes it principally for its flexibility, simplicity and speed. He doesn't use the Calcsheet or Typing modules any more, but does find the flat-file database useful in keeping track of over 140,000+ negatives by subject, date, location and client. He can get at that information from the Accounting module. The database facilities also enable him to design any report, labels, or CSV export he might want, using the accounts data, freeing him from the confines of standard reports.

Ideally, Tony would prefer the Windows environment but considers that "Nothing I have looked at comes close to ABC4's clunky old DOS accounts for speed and simplicity".

Most of Tony's work is commissioned, which means he gets the chance to discuss rates and fees before proceeding. He requires flexibility in handling his invoice charges because his fees can vary (he does not charge charities at his commercial rate). Sometimes, though, he has to accept the rate offered. ABC lets him set up several "stock" items, the codes for which he uses as service descriptions, complete with rate or flat-fee charges. This considerably simplifies the invoicing procedure to his regular customers. One-off expenses can also be added to his final invoice.

Tony Sleep, photographer

Tony uses the annual services of an accountant to prepare his end-of-year figures. He closes his books at the end of each month and calculates his VAT quarterly. As a non-accountant, he believes it is important and economical to use software which is simple to operate, while at the same time presenting his figures in a form familiar to his accountant.

■ *Tony Sleep 0181 840 3463; email* halftone@cix.co.uk

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Case Study: A friend to Saint Francis

Formerly in practice providing a service to small businesses, now a consultant with Maynard Heady, Don Heady is a chartered accountant, a member of the Council of the Institute of Chartered Accountants in England and Wales and a member of that body's IT faculty committee. He's the invited founder and, it has to be said, sole member of SPUD (Society for the Preservation of Users of DOS). He is honorary treasurer of the Saint Francis Hospice Development Trust and one of its trustees.

Saint Francis Hospice, which is in Havering-atte-Bower, Romford, is a registered charity offering care to patients with cancer or other terminal illnesses. It offers in-patient and day care, a home-care service and has a telephone advice line. It's also an education and resource centre, teaching others about the needs of patients who are seriously or terminally ill.

The Trust derives its income entirely from donations, with its expenditure, apart from its own overheads, being by grants to the hospice, thus putting both sides of its day-to-day finances on a cash basis. On taking up the office of treasurer, one of Don's first improvements was to computerise its financial records which, until then, had been manually maintained. Being a Money Manager user himself, and thoroughly familiar with its potential, he installed that software — the DOS version 4. This provided the necessary cashbook and investment recording facilities.

The Trust needs to keep records of expenditure, all its sources of income and whether donations are private or corporate. Money Manager's Class Codes take care of this. In addition, the Trust would like to know who its individual donors are, so Money Manager's "Marks" (additional and optional codes which can provide an extra level of analysis without affecting or sub-dividing existing analysis categories) provide the solution.

Don Heady, consultant and founder of SPUD

The Windows version 5 has now been installed to take advantage of the greater analysis provided.

The hospice uses both versions of Money Manager to monitor its £2m income and a similar amount of expenditure, which requires a considerable degree of analysis. The hospice perseveres with Money Manager for DOS because of its speed of data entry. It uses the Windows version for its drill-down facility which helps when examining monthly reports or year-end figures. With both the hospice and its fund-raising trust using Money Manager, accountants at both organisations can be familiar with each other's systems, irrespective of whether they prefer DOS or Windows.

■ *Saint Francis Hospice 01708 753319*
■ *Don Heady 01277 362905;*
email heady@cix.compulink.co.uk

Case Study: Capital takes the load

Based in Felixstowe, but drawing much of its business from North Sea ports and terminals, PJ Trailer Services offers a repair, maintenance and MOT-preparation service to RoRo (Roll-on-Roll-off) freight companies in East Anglia. We're talking about 38-ton, eight-wheeler, articulated flatbeds that take bulk goods and containers around the country. Before setting off, each must undergo a service and roadworthiness inspection, which is where PJ Trailer Services comes in.

A family firm, now run by the founder's son-in-law, Derek Crisp, PJ Trailer Services has eight fitting staff: three of them, including Derek, are directors. Derek himself was one of the East Anglian Daily Times' 1994 Business Personalities of the Month for rescuing the company from near-bankruptcy during the recession, ten years ago.

The books and other office duties are undertaken by Derek's wife, Ann. The business is a mixture of established customers, most with long-term contracts, plus a sprinkling of one-off repairs. Altogether, the company reckons to MOT over 800 trailers a year, turning over about £360,000 a year which makes it one of the biggest independent trailer service companies in the region. It operates a 24-hour emergency breakdown service, with its own tractor (cab) units to fetch and return trailers.

To computerise the accounting system, Derek and Ann chose Capital on the advice of their accountant and were one of the software's first customers. So far they have implemented the sales and purchase ledgers, tracking their labour and contract materials. And Capital produces their invoices, which are a mixture of goods, bought-in services and labour charges. Although they keep stock (consumables and essential trailer parts) they haven't yet implemented stock control, but this is planned. They're presently using Capital as a final accounting record only for payroll.

Derek Crisp, director of PJ Trailer Services

The Crisps appreciate that with Capital they can use as much or as little of it as they need, and work up to the full system in their own time. For instance, Derek still keeps his worksheet and timesheet records manually, although there is no doubt that Capital can help. Overall, Derek feels Capital has increased his company's trading potential by giving him day-to-day financial control in a way not possible with a manual system.

■ *Derek Crisp 01394 277111*

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Editor's Choice

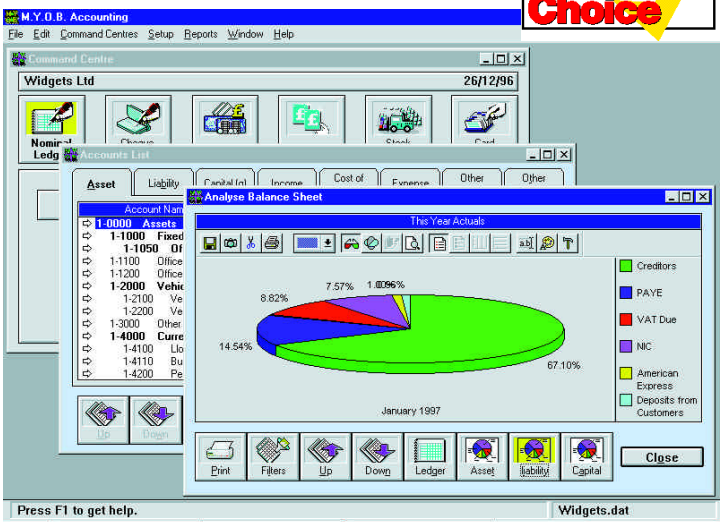
The criteria applied in assembling this selection of accounting software were suitability for small-to-medium businesses (a wide range) and ease of use (subjective). However, when selecting our recommendations, and keeping in mind those either new to computers or new to accounting, we also took into consideration the additional criterion of suitability for use by those *without professional accounting skills*. This instantly narrows the field, although not necessarily only to those programs usually thought of as being "entry level".

The best-selling small-business accounting software is QuickBooks and it's undoubtedly easy to use with a good range of facilities. For small businesses without manufacturing or manufactured stock complications, and especially for small service businesses, it remains a good choice. It has been a while, however, since it was upgraded and some of its later competitors are looking more versatile.

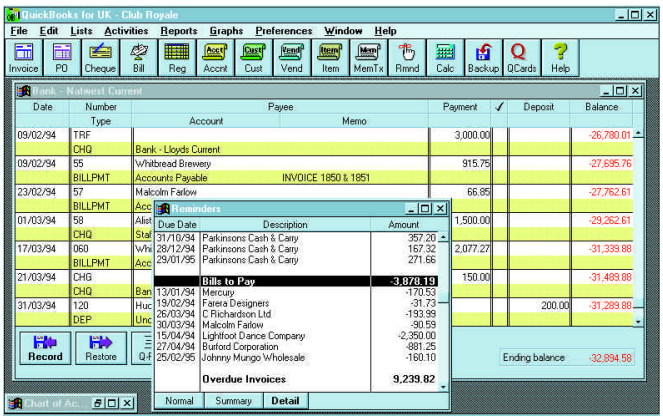
Two packages knocking at the door of Sage's Sterling, the most comprehensively featured software considered, are Capital by Pegasus and MAP's Pastel Accounting. Both include sales- and purchase-order processing, enabling users to computerise more aspects of their business than just the book-keeping. Partly because of this versatility, they are not, perhaps, suited to the absolute beginner without access to some hand-holding.

QuickBooks v3 and MAP Pastel Accounting are both Highly Commended, but our Editor's Choice is a program that is not only easy to get to grips with but also capable of considerable use before there's any likelihood of it being outgrown. For a sensible selection of accounting features coupled with its useful, though basic, contact management facilities, and certainly for the money, we recommend M.Y.O.B. It does without sales-order processing but its pending invoices and its job management facility do almost as good a job. It will also prepare your estimates and manage your stock. You get a good range of analysis codes and user-definable credit control. It gives help with awkward transactions like reversing postings which can otherwise leave you in a horrendous tangle, and has reasonably priced telephone support. You can format its output, helping to make a good impression on your customers (and bank manager), and for input you can choose flowchart or menu navigation. The inclusion of basic contact management and its daily reminder list means that the only other software many small companies might need is a word processor.

Right M.Y.O.B, our Editor's Choice, offers unrivalled versatility



Below Beginners could do worse than check out QuickBooks



Modular systems

If none of the integrated packages discussed here satisfy your requirements, you may need to consider a modular package. As the name implies, modular packages comprise several modules, each of which can be bought separately. This allows you to build up a software specification to suit your exact requirements with no redundant elements, and usually offers functions not available in the integrated software.

For many companies, changing up from a less sophisticated or manual system, modular packages offer a gradual way of easing into computerised accounts.

Another attraction is that modular software is usually better-specified in terms of features. There will be a more powerful analytical capacity, coupled with more flexible reporting options, so your accounts data yields more information not only as historical records but also as valuable management information.

Additionally, modular accounting packages are usually bought from VARs — Value Added Resellers, who have been trained by the publisher in all aspects of its software. This does mean, though, that the VAR probably only offers software from one publisher. It will probably also have access to the software's source programming, and will have experts on hand who are able to tailor it more closely to the peculiarities of your business. In some cases, you can have extra functions added just for you or for interfacing to your other systems. Many modular packages are capable of linking to industry-standard databases.

None of this comes cheap, of course, and the cost of individual modules may well exceed the total cost of an integrated package, pushing the price of modular software into the thousands of pounds rather than the hundreds. A typical modular system, with a central core of the three standard ledgers — sales, purchase and general or nominal — together with Invoicing and a Cashbook, could set you back more than £2,500 for a single-user licence, rising to over £15,000 for multi-user capability.

Extra modules would start at about £500 each and might include stock control, bill of materials, sales- and purchase-order processing, costing, BACS, job costing and estimating, as well as an asset register. To that must be added the cost of training your staff and of maintaining your bespoke system, which is as unlikely to be bug-free as any other software.

You will probably discover that most upper-end software is DOS-based, for the reason that it is often in full-time use entering data where GUIs (graphical user interfaces) get in the way of professional and expert keyboard users. But there is an increasing number of packages being published as 32-bit Windows NT applications. ■

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Table of Features

Name	ABC4	Access Intro	Pegasus Capital	Sage Instant Accounting	Money Manager
Price	£293 (£249.36 ex VAT)	£347 (£295.31 ex VAT)	£646 (£549.78 ex VAT)	£99 (£84.25 ex VAT)	£94 (£80 ex VAT)
Nominal ledger	●	●	●	●	●
Sales ledger	●	●	●	●	●
Purchase ledger	●	●	●	●	●
Invoicing	●	£100	●	●	£50
Stock control	●	£100	●	❍	with above
Sales order processing	£249	❍	●	❍	❍
Purchase order processing	❍	❍	●	❍	❍
Job costing	❍	£100	❍	❍	❍
Payroll	£99	£200	❍	❍	❍
Multi-company	●	❍	●	❍	●
Multi-user	£351	£200	❍	❍	❍
Multi-currency	❍	●	❍	❍	●
Euro-ready	❍	●	❍	❍	●
Year 2000-ready	❍	●	●	❍	●
Accreditation	❍	BASDA/ICACW	ICAW	ICAEW	❍
Initial support	Free	£120/12mths	Free/90days	Free/90days	Free
Extended support	Free	£120/12mths	£180/12mths	£75/12mths	Free
User club	●	❍	❍	❍	❍
Evaluation disk	❍	❍	❍	❍	❍
Operating system	DOS	Win 3.1	Win 3.1	Win 3.1	DOS/Win 3.1
Min. memory	1Mb	6Mb	4Mb	4Mb	4Mb
Disk space	1Mb	10Mb	6Mb	10Mb	3Mb
Supplier	ABC Direct Sales	Access Accounting	Pegasus Software	Sage Group	Connect Software
Sales Tel:	01257 480502	01206 322575	01536 495200	0191 255 3000	0181 743 9792
Web address www	❍	access-accounts.com	pegasus.co.uk	sagesoft.co.uk	❍

Table of Features

Name	MYOB v6	MAP Pastel Accounting	QuickBooks v3	Sterling Financial Controller	TAS Books 2
Price	£229 (£194.89 ex VAT)	£469 (£399.14 ex VAT)	£146 (£124.25 ex VAT)	£763 (£649.36 ex VAT)	£410 (£349 ex VAT)
Nominal ledger	●	●	●	●	●
Sales ledger	●	●	●	●	●
Purchase ledger	●	●	●	●	●
Invoicing	●	●	●	●	●
Stock control	●	●	●	●	●
Sales order processing	❍	●	❍	●	●
Purchase order processing	❍	●	❍	●	●
Job costing	●	❍	❍	❍	❍
Payroll	❍	❍	❍	£300	£99
Multi-company	❍	●	●	£149	£100
Multi-user	❍	£299	❍	£350	£150
Multi-currency	❍	●	❍	❍	❍
Euro-ready	❍	❍	❍	❍	❍
Year 2000-ready	●	●	●	❍	❍
Accreditation	❍	BASDA/ICAEW	❍	ICAECW	ICAEW
Initial support	Free/30days	Free/30days	Free/60days	Free/90days	Free/90days
Extended support	£75/12mths	£150/12mths	£76/12mths	£240/12mths	£180/12mths
User club	❍	❍	❍	❍	❍
Evaluation disk	❍	£30	£4	❍	❍
Operating system	Win 3.1	Win 3.1	Win 3.1	DOS/Win 3.1	DOS
Min. memory	4Mb	8Mb	4Mb	4Mb	640Kb
Disk space	10Mb	18Mb	10Mb	10Mb	10Mb
Supplier	Best!Ware	MAP Computer Products	Intuit UK	Sage Group	Megatech Software
Sales Tel:	01752 201901	0161 624 5662	01932 578501	0191 255 3000	0181 874 6511
Web address www	❍	pastel.co.za	iii.co.uk/intuit	sagesoft.co.uk	megatech.co.uk

Key: ● Yes ❍ No

Group Test: Notebook PCs

Making notes

You only get what you pay for, so they say. Well, if you're looking for a notebook PC, just what *can* you get for £2,500? Adele Dyer tested eight and was pleasantly surprised.

Mobile computing is facing a real dilemma. Are notebooks here to stay, or are they likely to be swept away with the advent of Windows CE on the latest crop of PDAs?

Are PDAs with their small size and light weight the way ahead, even though they offer limited computing power and are hell to type on? Or will PDAs, in turn, simply become internet machines and glorified mobile phones? Or, at the other end of the scale, are fully-featured, full-power MMX notebooks the way of the future?

The answer is probably that there is scope for all these machines in the market as they all serve very different needs. The large notebook is still useful for a few things: presentations, running power-hungry applications, or as a portable alternative to a desktop machine.

Whether you opt for a lightweight notebook or a fully-featured desktop replacement, price is undoubtedly the limiting factor in the decision process. If you have £5,000 to spare you can get some amazing machines, but we decided to see what we could get for a more reasonable £2,500. We specified that this figure should be a street price and exclude VAT. We insisted on 16Mb of RAM but left it to the manufacturers themselves to come up with the best deal they could put together. We were impressed with the machines we saw and think you, too, will be.

Notebooks Contents

Ratings

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

NOTEBOOK Photography by David Whyte

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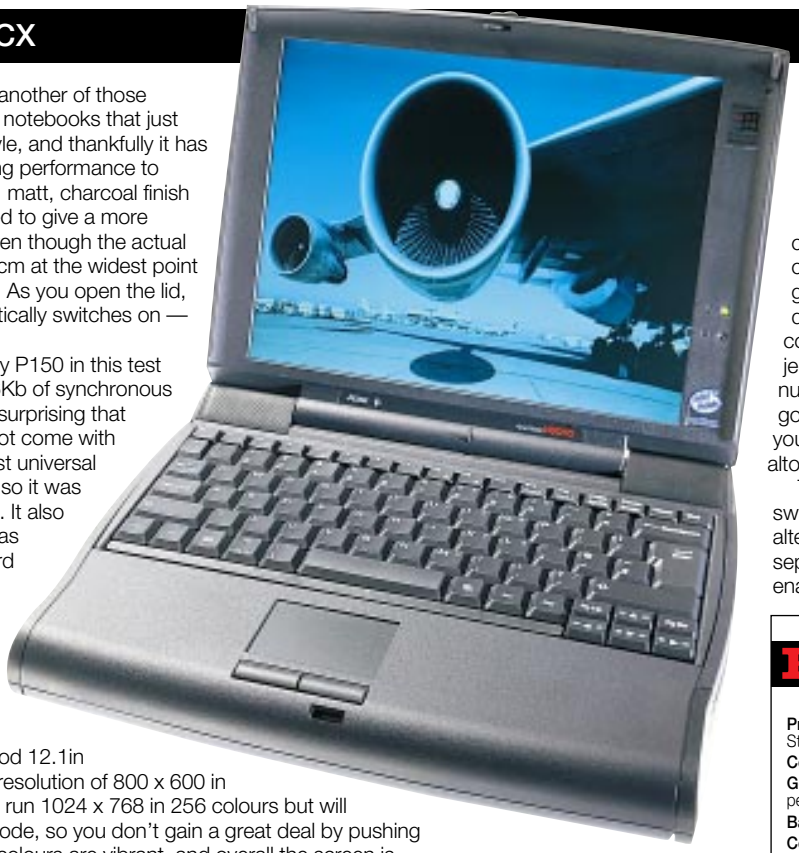
AcerNote 970CX

Personal Computer World Editors Choice



The Acer is another of those "show-off" notebooks that just scream style, and thankfully it has a screaming performance to match. It has a grainy, matt, charcoal finish and the front is tapered to give a more svelte appearance, even though the actual measurement of 30.7cm at the widest point belies this impression. As you open the lid, the notebook automatically switches on — quite a novelty.

The Acer is the only P150 in this test and benefits from 256Kb of synchronous SRAM L2 cache. It is surprising that more notebooks do not come with cache since it is almost universal in desktop machines, so it was pleasing to see it here. It also has 16Mb EDO RAM as standard, a 1.3Gb hard disk and the exceptionally fast NeoMagic 128-bit graphics chip, all of which boost the machine's performance results.

The screen is a good 12.1in TFT with a maximum resolution of 800 x 600 in 65,000 colours. It can run 1024 x 768 in 256 colours but will only do so in virtual mode, so you don't gain a great deal by pushing up to this mode. The colours are vibrant, and overall the screen is steady and even.

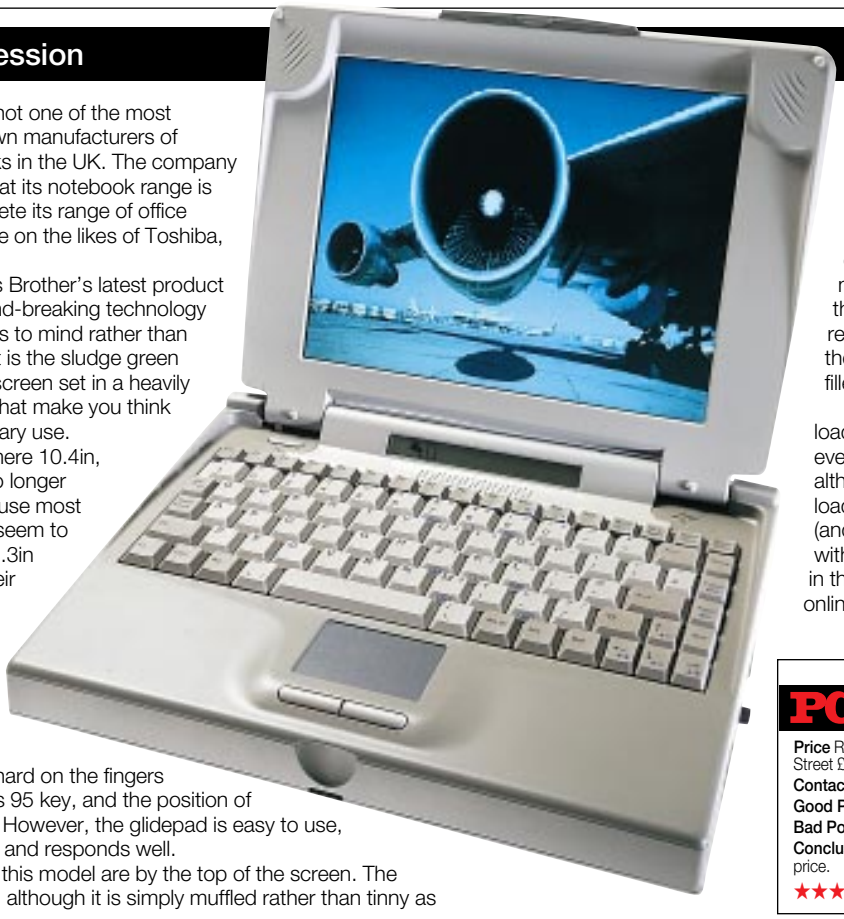
The keyboard is pleasant to use, with exactly the right amount of spring-back, and it can be tilted to a more comfortable typing position. The glidepad was not such a delight, however it was configured. It was sticky and jerky at best and a downright nuisance at worst. There is, thank goodness, a Windows 95 key so you can circumvent the glidepad altogether.

The CD-ROM drive can be swapped with the floppy drive or alternatively they can be run off a separate extension cable, enabling you to use both at once.

PCW Details

Price RRP £3,149 (£2,680 ex VAT). Street £2,812 (£2,393.19 ex VAT)
Contact Acer UK 01628 533422
Good Points Great design. Excellent performance.
Bad Points Jerky glidepad.
Conclusion An excellent little mover.
★★★★★

Brother Expression



Brother is not one of the most well-known manufacturers of notebooks in the UK. The company admits that its notebook range is there more to complete its range of office products than to take on the likes of Toshiba, Compaq and IBM.

The Expression is Brother's latest product but there is no ground-breaking technology here: "sturdy" springs to mind rather than "exciting". Perhaps it is the sludge green colour, or the small screen set in a heavily moulded surround, that make you think it is intended for military use.

The screen is a mere 10.4in, something we are no longer used to seeing because most manufacturers now seem to opt for at least an 11.3in screen except on their lowest-priced models. The screen quality was disappointingly average, being a little dull and lacking pizazz.

The keyboard is hard on the fingers and has no Windows 95 key, and the position of the keys is not ideal. However, the glidepad is easy to use, smooth to the touch and responds well.

The speakers on this model are by the top of the screen. The sound is not superb, although it is simply muffled rather than tinny as on many other notebooks on the market.

The CD and floppy drive are interchangeable and slide in and out easily enough, although you will need both hands to undo the catch. The hard disk is removable, but both slots on the bottom of the case are filled.

There are no useful utilities loaded on the Expression, not even for power management, although you do get a pre-loaded copy of SmartSuite (and on disk, too). Again, as with almost all the notebooks in this test, there is a bundle of online services ready to set up.

PCW Details

Price RRP £2,274 (£1,935.31 ex VAT). Street £1,985 (£1,689.36 ex VAT)
Contact Kyodai 01279 416888
Good Points Solid and robust.
Bad Points No utilities. Screen a little dull.
Conclusion A solid notebook at a decent price.
★★★

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Table of Features

Manufacturer	Acer UK	Brother	Evesham Micros	IBM
Model name	AcerNote 970CX	Expression (133 10.4)	Vale Quest	ThinkPad 365XD
Tel no.	01628 533422	01279 416888	01386 765500	0990 727272
Price - RRP	£3,149 (£2,680 ex VAT)	£2,274 (£1,935.31 ex VAT)	£2,277(£1,937.87 ex VAT)	£ 2,412 (£2,052.76 ex VAT)
Price - Street	£ 2,812 (£2,393.19 ex VAT)	£ 1,985 (£1,689.36 ex VAT)	Direct only	£ 2,190 (£1,863.82 ex VAT)
Processor	Intel Pentium 150	Intel Pentium 133	Intel Pentium 133	Intel Pentium 120
RAM supplied as standard	16Mb EDO	8Mb EDO	8Mb EDO	8Mb EDO
Maximum RAM	64Mb EDO	40Mb EDO	40Mb EDO	40Mb EDO
L2 cache	256Kb Sync SRAM	256Kb pipeline burst	256Kb pipeline burst	N/A
Hard disk size	1.35Gb	1.3Gb	1Gb	810Mb
Swappable components	CDD, FDD	CDD, FDD	N/A	n/a
CD-ROM speed	6X	10X	6X	4X
CardBus supported?	❍	●	❍	●
Zoomed Video supported?	❍	❍	❍	❍
Video memory size and type	1.1Mb EDO DRAM	1Mb VRAM	1Mb EDO	1Mb VRAM
Pointer type	Touchpad	Glidepad	Touchpad	Trackpoint
Sound enhancement technology	❍	❍	❍	FM Synthesis
IrDA	● (v1.0)	● (v1.0)	● (v1.0)	● (v1.0)
Screen size & technolgy	12.1in TFT	10.4in TFT	11.3in TFT	10.4in TFT
Maximum resolution	800 x 600	800 x 600	800 x 600	800 x 600
On-screen colours (800 x 600)	65K	65K	65K	256
Battery type supplied/claimed life	Li -Ion/10 hrs	NiMH/1.5 hrs	NiMH/2 hrs	NiMH/2 hrs
Dimensions (WxDxH) in mm	313 x 240 x 53	292 x 230 x 55	297 x 236 x 35 (nb only)	297 x 211 x 49
Weight with battery	4.2kg	3kg	2.5kg (nb only)	2.92kg
Software bundle	Win95, MPEG player	Win95, SmartSuite 96	❍	Lotus SmartSuite
Basic warranty	1 yr swap-out	1 yr RTB	1 yr	1 yr
Warranty options	Max 2 yr extension	1, 2, 3 yrs on-site	1, 2, or 4 yrs	1, 3, 5 yr extensions
Technical support	National rate (0990 134348)	National rate (01279 410330)	National rate	24 hrs Helpware membership

Table of Features

Manufacturer	Opti International	Samsung	Sharp	Toshiba
Model name	Calibre Plus	Sens Pro 500	PC-9040	Satellite Pro 430CDT
Tel no.	0181 507 1818	0181 391 0168	0800 262958	01932 828828
Price - RRP	£1,927 (£1,640 ex VAT)	£2,932 (£2,495.31 ex VAT)	£2,701 (£2,298.72 ex VAT)	£3,167 (£2,695.31 ex VAT)
Price - Street)	Direct only	£2,697 (£2,295.31 ex VAT)	£2,348 (£1,998.29 ex VAT)	£2,691 (£2,290.21 ex VAT)
Processor	Intel Pentium 133	Intel Pentium P120	Intel Pentium 133	Intel Pentium 120
RAM supplied as standard	8Mb EDO	16Mb EDO	8Mb EDO	16Mb EDO
Maximum RAM	32Mb EDO	72Mb EDO	48Mb EDO	48Mb EDO
L2 cache	256Kb pipeline burst	256Kb pipeline burst	N/A	N/A
Hard disk size	1Gb	1.3Gb	1.1Gb	1.35Gb
Swappable components	CDD, FDD	CDD, FDD	Battery, CDD, FDD	CDD, FDD
CD-ROM speed	8X	6X	6X	10X
CardBus supported?	❍	❍	●	❍
Zoomed Video supported?	❍	●	❍	●
Video memory size and type	1Mb VRAM	1Mb VRAM	1Mb VRAM	2Mb VRAM
Pointer type	Touchpad	Touch sensitive pad	Glidepad	Mousepoint
Sound enhancement technology	Wavetable	Wavetable	Synthesised	FM Synthesis
IrDA	● (v1.0)	● (v1.0)	● (v1.1)	● (v1.0)
Screen size & technolgy	11.4in STN	12.1in TFT	11.3in TFT	11.3in TFT
Maximum resolution	800 x 600	800 x 600	800 x 600	800 x 600
On-screen colours (800 x 600)	256	65K	65K	16.7 million
Battery type supplied/claimed life	NiMH/3 hrs	NiMH/2 hrs	Li- Ion/2 hrs	Li -Ion/up to 4 hrs
Dimensions (WxDxH) in mm	292 x 224 x 48	300 x 290 x 47	297 x 245 x 58	299 x 235 x 57
Weight with battery	2.8kg	2.95kg	3.4kg	3.4kg with CD-ROM
Software bundle	Win95, CompuServe	Win95, Win 3.11	Win95, Win 3.11	Win95 or Win 3.11
Basic warranty	3 yr BTB	3 yrs	3 yrs RTB	3yr International
Warranty options	To be announced	3 yrs RTB	n/a	Back to dealer
Technical support	National rate	0345 573098	Phone/email/fax support	Back to dealer

● Yes ❍No

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Evesham Micros Vale Quest

When Compaq introduced its Armada 4100 model last year, it was obvious that sooner or later the Taiwanese would start cloning it. So it was no surprise to see Evesham's latest notebook use the same idea of a slimline unit coupled with a media docking station, with a CD-ROM drive and extra speakers.

However, despite its slimline appearance, the weight advantage of the Compaq 4100 has not been replicated in the Quest. The basic notebook has a floppy drive and speakers, plus the usual connections and ports. Putting it on top of the media docking station does make it exceptionally large, though. The extra speakers do not make that much difference to the Quest's mediocre sound quality.

The notebook itself makes the most dreadful noise; it sounds like an old vacuum cleaner buzzing away down the corridor. This was obviously the product of an irritated fan, and extremely annoying.

The screen is an 11.3in TFT. Overall it was crisp and clear although the colours were a little faded. Brightness is controlled from the keyboard via the function keys, which is never very satisfactory. There is no bar or other measure on-screen so you cannot tell to what extent you have increased the brightness.

The keyboard is firm and feels entirely robust, my only gripe being the small size of the function keys, especially the delete key, which is the size of the nail on your little finger.

The performance was less than inspiring for a P133, which may be attributed to the lack of L2 cache. However, it should be noted that slimline notebooks usually perform less well than larger models because power is sacrificed to jamming everything into a smaller space.

PCW Details

Price £2,277 (£1,937.87 ex VAT). Only available direct.
Contact Evesham Micros 01386 765500
Good Points Slimline.
Bad Points Slow performance. Noisy.
Conclusion Only for those who cannot afford the Compaq 4100.
★★

IBM ThinkPad 365XD

Personal Computer World Highly Commended

The 365 ThinkPads are at the bottom of IBM's range, below the 760s and the slimline 560s. Yet you'd never know that it's low-end. The 365XD we saw outperforms and out-swanks many other notebooks.

The screen was only a 10.4in TFT, although larger screens are available on other models. Nevertheless, it is still an excellent screen, capable of running in 65,000 colours at 800 x 600, and is vibrant and even. There is a brightness knob next to the screen so you don't have to faff about with function keys.

The 365XD is slim and elegant and, like the 760, it has a certain amount of modularity in its internal build. The keyboard can be lifted to reveal the battery and the CD-ROM drive, but only the battery can be removed. The separate floppy drive is attached via a dedicated port.

As with all IBMs, the 365 is loaded with a mass of utilities: TranXit, IBM AntiVirus, CompuServe, ccMail Mobile, NetFinity, PC Card Director, Emergency Recovery Utility (ERU), IBM Online, Diskette Factory, and ThinkPad bits and pieces including a power management utility, personalisation utility, online manual, features settings utility and a tutorial. All this makes it easier to handle the notebook's functionality and performance and ensures a smooth passage to getting online. Strangely, as in the Toshiba Satellite Pro, power management is set via IBM's own Windows utility and not in the oddly limited BIOS settings.

The keyboard is firm but clatters a little, and the trackpoint is easy to manipulate. The feet on the bottom tilt the notebook forward at a rakish angle. The sound isn't good though, being tinny and muffled.

PCW Details

Price RRP £2,412 (£2,052.76 ex VAT). Street £2,190 (£1,863.82 ex VAT)
Contact IBM 0990 727272
Good Points Lots of utilities. Good screen.
Bad Points No internal floppy.
Conclusion Another winning ThinkPad.
★★★★

p198 ➢

Notebook screens

Notebook displays vary widely in quality; from stunning to dire. The reason lies in the make-up of the screens. The two main choices are thin film transistor (TFT) or passive matrix screens, also known as dual-scan supertwisted nematic (DSTN). Both are liquid crystal displays (LCDs), so called because they have a layer of liquid crystals sandwiched between layers of filters. TFT screens are much higher quality but are difficult to produce in high yields, and this is reflected in the price.

All LCDs are backlit, the light source usually coming from an array of cold fluorescent tubes at the back of the screen. In front of this is the first of two polarising filters. Infinitesimally small lines constructed in the filters themselves only let through light travelling in the right direction, so filtering the ambient light into polarised or coherent light. The lines in the first filter are arranged vertically, and in the second, horizontally. If the light were allowed to pass directly from one filter to the other, it would all be blocked and the screen would remain dark. However, the layer of liquid crystals sandwiched between them twists the light, allowing it to pass through the second filter to the front of the screen.

In notebooks, the liquid crystals are rod-shaped or nematic molecules which are aligned by grooves in plastic, so bending the light that passes through them. How much they bend can be controlled by the amount of current passed through to them. The twist in the crystals determines the bend in the light. In their resting state, crystals typically twist through 90 degrees, so with no current applied all the light can pass through the filters. When the current is on, the crystals twist and block the light, darkening the pixels.

There are numerous ways of arranging the crystals. Supertwist Nematic (STN) screens have supertwist liquid crystals which bend light by 180° to 270°. Double Supertwist Nematic (DS or DSN) has two layers of supertwist liquid crystals back to back, so one bends light in the opposite direction to the other. Triple Supertwist Nematic (TSN) layers both sides of liquid crystal with thin polymer films. Films absorb less light than double supertwist, so less light and therefore less power is needed.

Above each crystal there are red, green and blue filters and, in TFT displays, elements which add the colours. In a TFT screen, each pixel is made up of three cells, or sub-pixels, in red, green and blue. The amount of light that passes through the filters and elements alters the hue of each colour, and so, as on your TV, millions of colours can be created using just three base colours.

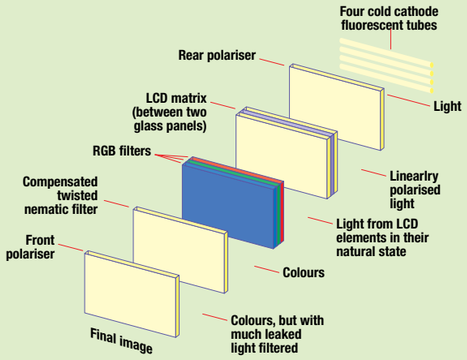
The main difference between passive matrix and TFT screens is how the current is applied to the crystal. In the former, the current is delivered via a grid system. The pixels are placed at the intersections of the horizontal and vertical lines. When the current rises above a certain point, the pixel is activated. The main disadvantage of this technology is that it is impossible to turn on one pixel without affecting those around it. This creates "crosstalk", which appears on the screen as bleeding and distortion. Contrast is reduced, the viewing angle is restricted, and colours are muted and less discernible. The grid system also slows the refresh rate of the screen, so flicker is common.

Some screens improve on the basic passive matrix design. DualScan splits a screen in half and gives each its own driver, enabling a faster refresh rate, improved contrast ratio, and reduced shadowing and bleeding.

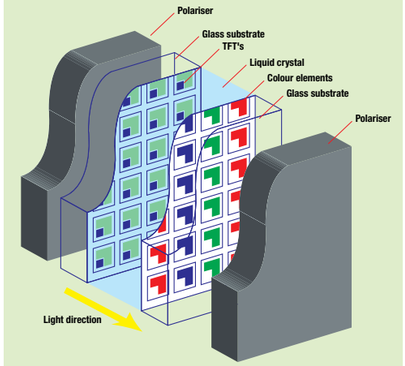
TFT or active matrix screens have the same grid of conductors to control the current, but at each pixel there is a transistor which switches on or off depending on the current. Transistors are connected horizontally to form the scanning lines and vertically to form the signal lines. Horizontal lines are switched on in turn, from top to bottom of the display, while the voltage to vertical lines is varied. Each pixel is thus independent of its neighbour, leading to greater clarity and sharpness. TFTs run at much higher refresh rates than passive matrix screens and in some instances outperform CRT monitors. A separate transistor is needed for the red, green and blue cells in each pixel, so for a 1,024 x 768 screen you need a massive 2,359,296 transistors: if 12 of these fail when the screen is tested after manufacture, the screen is discarded. This is partly why the cost of TFT screens remains high. Typically, TFT screens run at a resolution of 800 x 600 in 65,000 colours, while DSTN screens are often only capable of 256 colours at the same resolution.

Although 12.1in TFT screens are commonplace, 13.3in screens are expected to be available in the near future. ■

NEC passive colour display: How it works



Structure of NEC TFT colour LCD



Spot the difference: the carefully aligned TFTs and colour elements in the active matrix screen give a sharper picture than the passive matrix screen

p203 ➢

Opti Calibre Plus

Opti was the only manufacturer to send us a DSTN (dual scan twisted nematic) screen; the others opted for TFT. Although TFT screens are becoming more common, many notebook manufacturers still offer DSTN screens as a cheaper option.

This particular 11.3in DSTN screen demonstrated the reasons why TFT is now the technology of choice: it suffered from bleeding and shadowing, caused by crosstalk *(see page 198)*. It runs at a resolution of 800 x 600, but only in 256 colours, unlike its TFT equivalents which were capable of 65,000.

The build quality of the Calibre is reasonable, although it does look a little pedestrian. The CD-ROM drive and the floppy drive swap in and out but there is no external bay to run both at once. There is a catch at the bottom of the notebook which releases and pushes out the drives a small way, thus minimising wear and tear as you battle to get them in and out.

The RAM can be upgraded by unscrewing a plate at the back, revealing one free slot. But don't be tempted to go poking around in there; a huge notice warns you that your warranty will be void if you remove the plate.

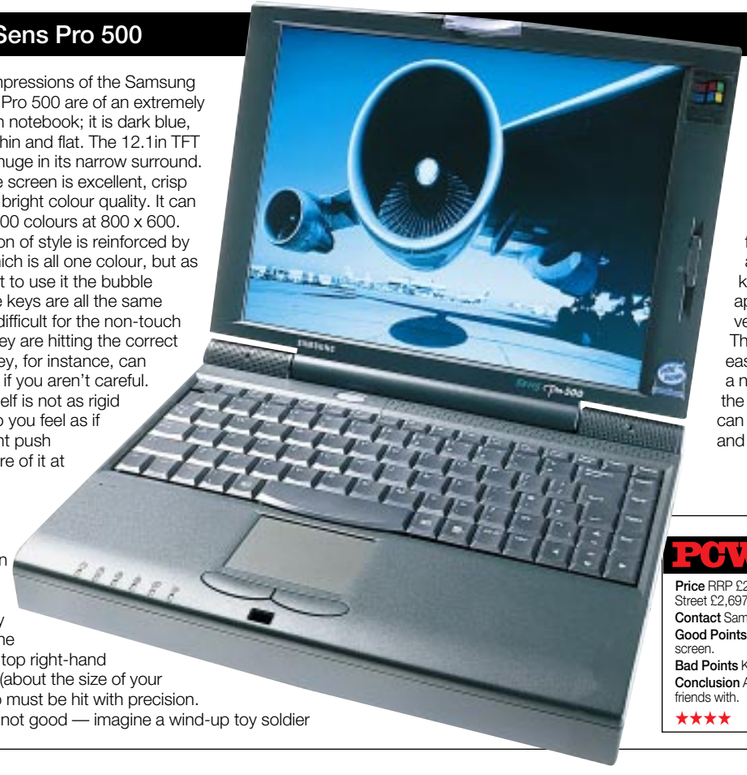
The keyboard is quite firm to the touch but is also noisy, and although the trackpad feels stiff at first, you soon get used to it. But like all too many trackpads, it is inaccurate and there is no Windows 95 key to make up for this. Some of the symbols on the function keys are a little obscure, which is unfortunate since many controls (including the brightness and volume) are operated from the keyboard.

The sound is tinny but there is no hiss, and you can get a decent volume out of the speakers.

PCW Details

Price £1,927 (£1,640 ex VAT). Only available direct.
Contact Opti International 0181 507 1818
Good Points Reasonable build quality.
Bad Points DSTN screen. Poor performance.
Conclusion The bargain basement option.
★★★

Samsung Sens Pro 500



First impressions of the Samsung Sens Pro 500 are of an extremely stylish notebook; it is dark blue, very thin and flat. The 12.1in TFT screen appears huge in its narrow surround. The quality of the screen is excellent, crisp and clean with a bright colour quality. It can be driven in 65,000 colours at 800 x 600.

The impression of style is reinforced by the keyboard which is all one colour, but as soon as you start to use it the bubble bursts. Since the keys are all the same shade it can be difficult for the non-touch typist to see if they are hitting the correct keys. The shift key, for instance, can easily be missed if you aren't careful. The keyboard itself is not as rigid as it could be, so you feel as if your fingers might push through the centre of it at any moment.

The function keys are well marked, with words rather than symbols to denote their use, even though they are very small. The delete key in the top right-hand corner is minute (about the size of your little fingernail) so must be hit with precision.

The sound is not good — imagine a wind-up toy soldier banging on a tin drum at the bottom of a well. It is tinny in the extreme, it echoes, and it's not even that loud.

Having read this, you could be forgiven for giving the Samsung a wide berth. But keyboard and sound apart, this is otherwise a very good notebook. The CD and floppy are easily swapped thanks to a nifty little flip-switch on the back, and the battery can be exchanged quickly and easily.

PCW Details

Price RRP £2,932 (£2,495.31 ex VAT). Street £2,697 (£2,295.31 ex VAT)
Contact Samsung 0181 391 0168
Good Points Excellent styling. Good screen.
Bad Points Keyboard. Sound.
Conclusion A notebook to impress your friends with.
★★★★

p205 ➢

VNU Labs Report: Usability

Notebook users fall into two main categories: those who want all the functionality of a desktop system in a notebook, and those who are looking for portability over functionality. With the second group in mind, our VNU Usability Labs recently tested four different notebooks to see how they performed on the move. Although these particular notebooks were not those reviewed in this group test, the results did highlight some of the general problems you might encounter when working on the move.

Usability, or HCI (human computer interaction), is an assessment of six key areas: efficiency, intuitiveness, error rates, ergonomics, how quickly you can learn, and how quickly you can remember how to perform certain tasks. All these factors are essential if you want to work effectively.

The evaluators were business professionals, travelling from London to Brighton by train. They all had to complete a series of tasks on each of the four notebooks using Microsoft Office and any pre-installed notebook utilities under Windows 95. They were asked to assess seven areas: ergonomics (screen, keyboard, pointing device, build quality), power management (was it easy to understand, set up and change?), help (on-line and manuals), installation, weight, ease of use and modularity (by installing peripherals such as CD-ROMs).

The quality of pointing devices and keyboards is a highly important issue in mobile computing. In a moving environment, the evaluators had more problems using touchpads than using

trackpoints on their notebooks. Judders, whether they are caused by turbulence in an aircraft or bumping along an uneven railway track, will make your hand jiggle on the surface of a touchpad and in extreme cases can render the device unworkable as the pointer movement becomes too erratic.

Many notebook users do not generally understand power management, and most leave the notebook's power management configured as supplied. They do not want to bother with switching power-saving modes and require maximum battery life with a minimum of fuss. As a result, systems with clear power facilities such as easily-identified function keys and intuitive software, fared better than those that relied on BIOS settings.

The optimum weight for a notebook is purely a matter of individual preference. In our study, some of the evaluators considered that even the heaviest of the notebooks were quite portable, while others found the lightest ones difficult to carry around. So really, the only way to find the ideal weight of notebook for you, personally, is to actually lift it.

Jonathan Ricks

Ten top tips for choosing a notebook

1. Decide what you want from the machine: do you need a desk-top replacement, or something light and portable?
2. What components do you need? If you are only going to use it for catching up with your email and typing the odd letter, a CD-ROM drive and speakers are luxuries. Swap-out components, like CD-ROM and floppy drives, can be a pain for regular use but save on weight if you only need to carry one or other with you.
3. The weight of your notebook is a major consideration. If you travel on public transport and carry a heavy 3.5lb machine, your arms will end up stretched to the floor. It could be worth paying a little more and sacrificing some speed for a lightweight model.
4. Battery life should match your needs. If you are away from a power point for long periods, you may need to carry more than one battery. Some notebooks can house multiple batteries, but as they are just about the heaviest part of a notebook, you must pay for the convenience. Nickel-Metal Hydride batteries are cheaper than Li-Ion batteries but they run down quickly and have to be completely spent before recharging, to avoid degradation.
5. Most notebooks now have TFT screens but passive screens cannot not be ruled out; okay, they bleed and aren't as crisp as TFT screens, but they're cheap.
6. Generally, notebook sound quality is not good. For presentations, it's worth investing in a pair of external speakers.
7. Many modem manufacturers offer deals on PC Card modems. These don't always offer the best value so you might be best advised to shop around in the back pages of *PCW*. However, PC Card modems are difficult to configure, so choosing a modem you know to be compatible with your notebook might save you hours of frustration during installation.
8. So you have decided on a spec: before you start looking through the ads, decide how much you want to spend, then subtract a few hundred pounds. It may sound like a strange suggestion but advertised prices will probably be for minimum configurations; many notebooks will have only 8Mb of RAM. By the time you've allowed for an upgrade from a passive matrix to an active-matrix screen, put in a larger hard disk or a better battery and upped the RAM to 16Mb, you will have added significantly to the basic price, so the notebook that at first seemed a bargain is now worthy of a second mortgage.
9. Where should you buy? If you buy retail, you will get a limited choice and will pay the "high street premium". Buying direct cuts out the middle man and cuts the cost. Resellers can usually offer good deals on large quantities, and can provide their own extended warranties and technical support.
10. Warranties are not something to take lightly, as notebooks take quite a pounding. Many manufacturers offer a three-year warranty as standard. It's a good idea. Extended warranties are worth considering too, but it's wise to shop around. ■

p208 ➢

Sharp PC-9040

Sharp has a wide range of portable products, from the handhelds like the ZR-8000 and the ZR-5800, through the WideNote, to the 9040 and the top-of-the-range 9300. The 9040 does not have the same power as the 9300, although many other features are the same, and it does not have the compact size and impressive screen of the WideNote *(reviewed in PCW, Feb)*. But despite all that, it is a contender in its own right.

Sharp is renowned for its screens. It is a major manufacturer of flat screens and has produced its own, patented, Super High Aperture technology. But this active matrix screen was not of the usual quality. It suffered slightly from bleeding and it seemed that there was some crosstalk going on (the fault may have been a one-off on this particular model). Nevertheless it was bright, with good colour.

Overall, the components are good quality. The keyboard is excellent, almost the best in this group; quiet and firm, but not spongy. The function keys are a good size and the layout is sensible.

The sound on this notebook is also among the best in this test. It was a little thin but did not overly suffer from tinniness and hiss as did most of the others, and it handled bass and reverb well.

The floppy and CD-ROM drives are both included in the main body of the notebook, although the CD-ROM drive can be swapped out and a second battery fitted in its place.

There were two other nice touches. First was the power cord which can be plugged straight into the mains without the need for an adaptor. And second, as Sharp is part of the IrDA standards committee, IrDA 1.1 is supported at speeds of 4Mbits/sec.

PCW Details

Price RRP £2,701 (£2,298.72 ex VAT). Street £2,348 (£1,998.29 ex VAT)
Contact Sharp 0800 262958
Good Points Excellent sound. Second battery capacity.
Bad Points Screen below par for a TFT.
Conclusion Good notebook, marred by a bad screen.
★★★

Toshiba Satellite Pro 430 CDT

Personal Computer World Highly Commended

The Toshiba range is divided into categories according to how much new technology will be included on the notebook. The Tecra range is top of the pile, followed by the Protégé series. Just below this come the Satellite Pros.

This notebook is a solid beast, with functionality leading over portability. But this is not too much of an issue because you get extremely high quality for your money. The screen is an 11.3in, 800 x 600 TFT running at a refresh rate of 60Hz in a maximum of 16 million colours. As you might expect, it is clean, crisp and bright.

The CD and the floppy can be swapped from the notebook into a separate hard case, connected to the notebook via a dedicated port. In practice, this means you probably change the drives less often, reducing wear and tear as well as the annoyance factor.

One of the best things about Toshiba notebooks are the utilities provided. MaxTime Manager enables you to play around with the power and performance settings, providing a good deal of scope to achieve your exact requirements. You cannot get into the BIOS to change settings, but as many users feel more comfortable making changes via Windows, and the utilities are so good, this is no great loss.

The Satellite Pro does not have an internal modem but the pre-installed CardWorks utility should make it easy for you to install a PC Card modem. There are two Type II slots or one Type III slot.

The sound is reproduced through one small speaker at the front of the notebook, which carries a volume knob. Turning the volume right up in the software as well as on the speaker produces a reasonable sound, albeit a little metallic.

PCW Details

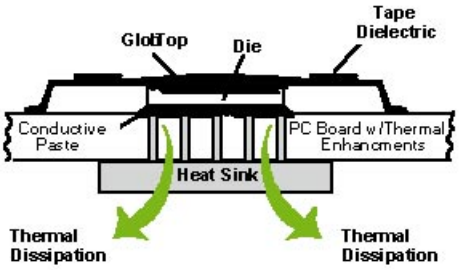
Price RRP £3,167 (£2,695.31 ex VAT). Street £2,691 (£2,290.21 ex VAT)
Contact Toshiba Information Systems 01932 828828
Good Points Outstanding build quality.
Bad Points A little chunky.
Conclusion An excellent notebook.
★★★★

Mobile computing

It has taken a while to get the functionality of a desktop machine into a notebook. Although notebook components must be squashed into a smaller space, the real issue is one of power. Modern batteries are not all they are cracked up to be, and if your battery only lasts a short time you must squeeze as much life from it as possible. If the desktop chips run at 3.3v, it's going to eat up a lot of the available power. Not only does a chip need to consume less power, but it also needs to be able to control the power in other parts of the system.

Another problem is heat. Pentium processors run very hot, so in a desktop machine they will have a fan or a heat sink above them. In a notebook you don't want a fan consuming power, yet heat sinks use up too much space. Other components in the notebook are cooled by devices like heat pipes and thermal sensors, and by using the system chassis to vent heat externally. Intel's answer was to develop mobile Pentiums and house them in a Tape Carrier Package (TCP). Voltage Reduction Technology dissipates the heat by allowing the external pins of the processor to be powered at 3.3v while the chip itself runs at 2.9v, with the core running as low as 2.45v. In this way, the chip can still communicate with components operating at 3.3v. This combination provides power savings of up to 40 percent over standard processors. The chips are 65 percent smaller and weigh 95 percent less than desktop processors.

The TCP is a thin piece of film with copper foil laminated onto one side. The copper is photo-imaged and etched to make traces and leads which form the connection from the processor's silicon to the circuit board. The traces are gold-plated to bond to the silicon and prevent corrosion. The silicon is then coated with resin.



The latest notebook processors are MMX-enhanced with the larger instruction set, 32Kb of Level 1 cache and eight 64-bit registers. But Intel has ensured that they remain a small step behind the desktop models as the chips will only run at 150MHz and 166MHz as opposed to 166MHz and 200MHz in the desktop models. Yet the advantages of MMX in notebooks are more exciting than in the desktop. The extra power allows more processing to be handled by the processor, avoiding the need for extra hardware. Software modems are one example: once the signal has been received and converted to digital data, the MMX chip can process it. Modems can then be added to the system board without fear of them lagging behind current communication speeds, as only the firmware would have to be upgraded.

• *Unfortunately we were unable to edit out the typographical errors in the diagram above.*

Connectivity

The days of standalone working have gone, so having a notebook that cannot communicate with another PC is about as useful as ice-skates in the Caribbean. But help is at hand, and there are now countless ways to wire up your notebook to the office network or the internet. The four main ways are by PC Cards, IrDA, built-in modems and mobile phone.

PC Cards are commonplace and there is now a wide range of modems (some with ethernet adaptors) costing from as little as £120, or £250 with a LAN adaptor. ISDN adaptors in PC Card form are beginning to appear: expect to see more in the coming months. Another development in PC Card technology is CardBus, a 32-bit extension to the 16-bit PC Card peripheral interface. It enables data throughput rates of up to 132Mbits/sec, but as yet there are few cards on the market which support this standard.

PC Cards have some disadvantages. Firstly, they are difficult to configure and can have you pulling your hair out in frustration. All the workings of a PC Card have to be in software, so if you have a conflict there are no jumpers you can change to force it into submission. You may be unlucky and find that your PC Card will not work with your notebook no matter what tricks you try.

You should make sure your modem is certified for use by whatever country you are in. Almost every country in the world has a different telephone system and modems that are not configured to work correctly with a particular phone system are likely, at best, to play up, worst, to damage the phone line.

An increasing number of notebooks are coming with the modem already built in, so all you have to do is connect the wire and plug it into the telephone socket.

All the notebooks in this group test came fitted with IrDA (Infra-red Data Association), mostly complying to the older IrDA 1 specification. But there are a few notebooks on the market which follow the IrDA 1.1 specification, notably from Hewlett-Packard, NEC and Sharp which are active participants in the IrDA standards committee. IrDA 1.1 is also known as FastIR and has a data throughput rate of either 1.5Mbits/sec or 4Mbits/sec, while standard IrDA can only manage 115bps.

For mobile communications it is possible to connect a mobile phone to a notebook via a suitable PC Card and use it as a modem on the move. Whether you're sitting in a train, a car or at a remote location, you can email, fax or browse the web, wherever your phone has a signal. You'll need a suitable digital mobile phone connected to Orange, one2one, Cellnet GSM or Vodafone GSM. Mobile data is reliable but operates at 9,600bps (maximum) and can drop lower under demanding conditions.

Remember that all PC Cards will drain your notebook's battery, so remove them or activate sleep modes when not in use.

p210 ➢

Editor's Choice

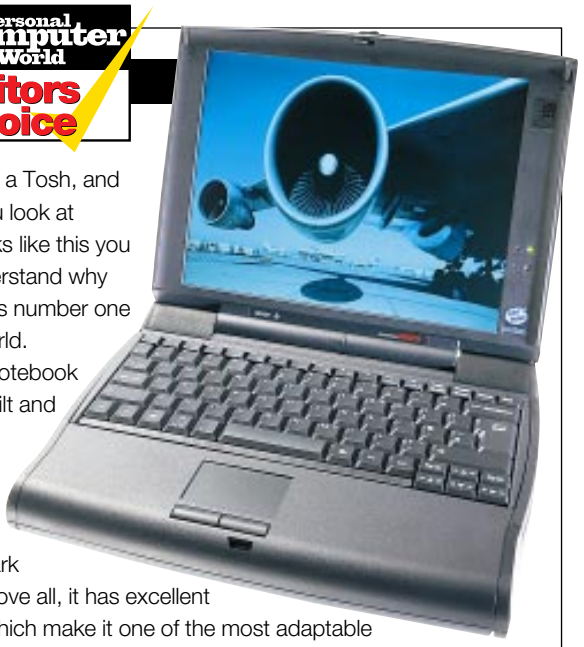
Choosing a notebook that is right for you is a complicated business: not only must you hit the right price and the right components, but the machine must also suit your intended purpose.

There is no such thing as "the perfect notebook" so the choices we have made are based on three criteria: speed, build quality and ease of use. Let's face it, if you are going to spend £2,500 on anything, you want to make sure it is going to perform well and will last the course.

Most owners have notebooks so that they can make presentations and use a word processor, a spreadsheet and email. For presentations you need to make an impact, and if your battered old notebook is not equal to the task, it can take the edge off your image. Notebooks can take a good bashing as they are humped around, so it makes sense to buy a sturdy, well-built product that will last the distance.

The clear winner of our Editor's Choice, in terms of speed, has to be the AcerNote 970CX. This was the only machine to have a P150 processor, which obviously made an impact in the tests, but it was also one of the few to include 256Kb of secondary-level cache. Also, the NeoMagic 128-bit graphics chip takes the strain off the processor, and this again shows in the Windows applications results. Add to this nice styling and extremely long battery life, and you've got a winner.

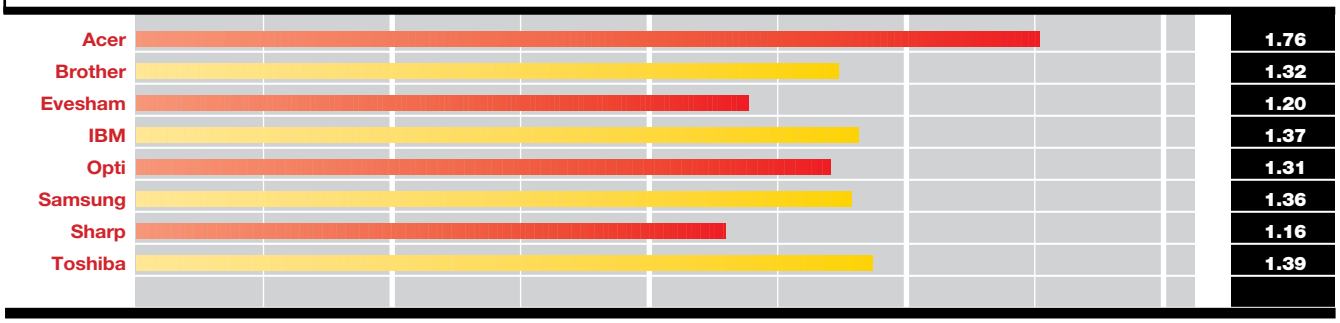
The Toshiba Satellite Pro 430CDT is Highly Commended. It is after all a Tosh, and when you look at notebooks like this you fully understand why Toshiba is number one in the world.



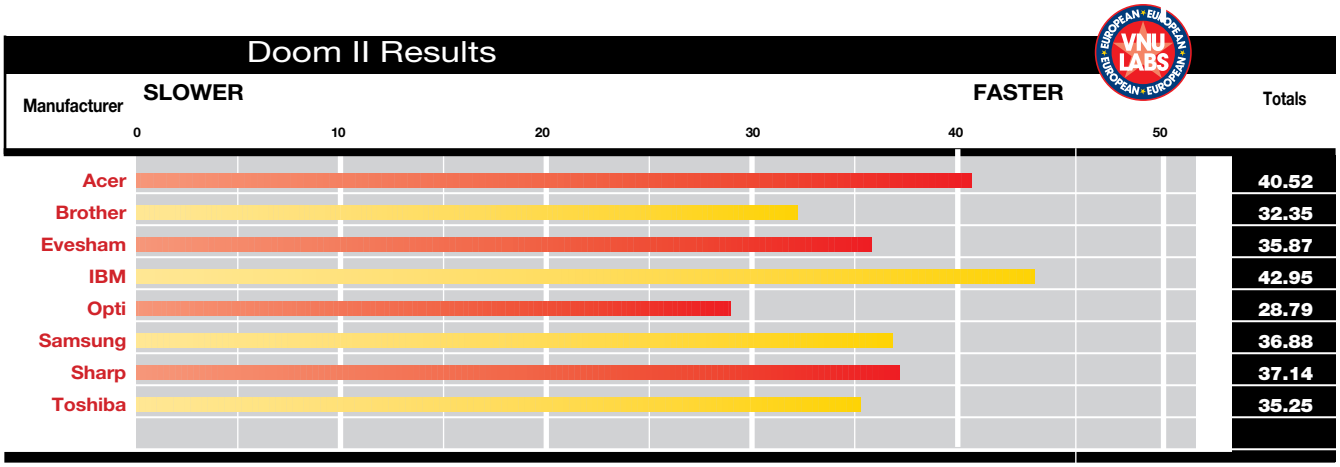
This notebook is well built and achieved good scores on our benchmark tests. Above all, it has excellent utilities which make it one of the most adaptable and easy-to-use notebooks on the market.

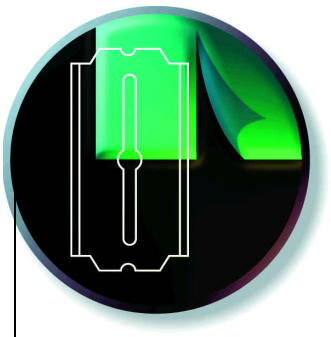
The IBM 365XD also receives our nomination as a Highly Commended product. Like the Satellite Pro, the 365 is not a top-of-the-range product, but because it comes from the ThinkPad stable some of the innovation and design excellence applied to the higher-level models has filtered down into this one. The screen and its build quality are equal to that of more expensive notebooks and you get the usual armoury of utilities that come with an IBM as a matter of course. ■

Windows Applications Results



Doom II Results





Freedom of speech

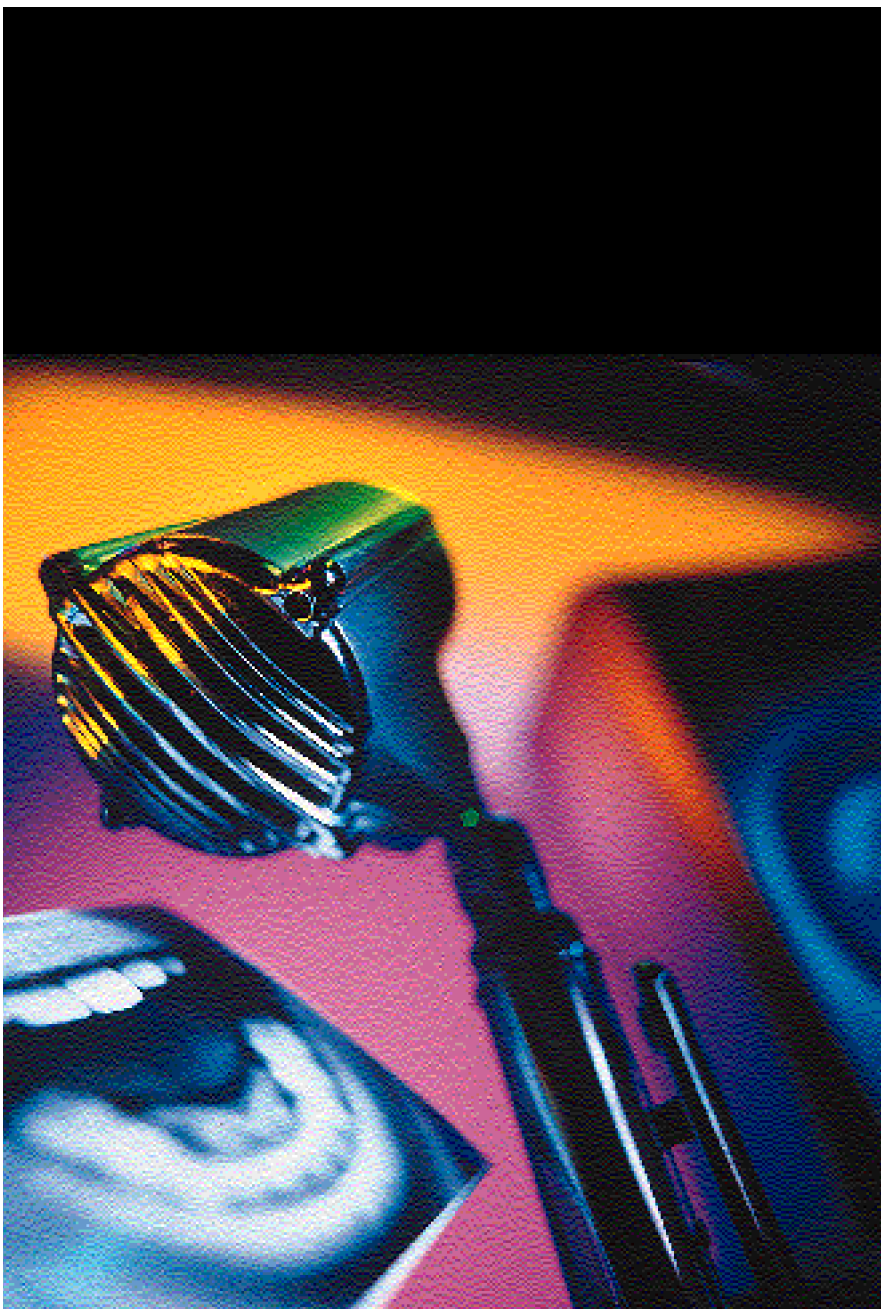
As the web is a place to canvass in the run-up to the general election, so extreme political groups are taking advantage of the web to propagate their policies. Tim Phillips reports.

Taking over an embassy and holding 74 people hostage isn't the sort of politics we're accustomed to in the UK, so when the Tupac Amaru Revolutionary Movement (MRTA) did just that at the Japanese Embassy in Peru on 17th December 1996, the event predictably made headlines.

But if the kidnappers thought their actions were a way to put across their political message to the world's media, they were mistaken. Not surprisingly, the news coverage centred on the human story of the hostages in the embassy. More time was given to the presence of Mariachi bands at the embassy gate (hired by relatives of the hostages to boost morale) than to the details of the guerrilla's demands.

But the MRTA had a secret weapon, enabling it to take its political message to the public and bypass the traditional media. The day after the siege began at the embassy, it posted its Solidarity Page, Voz Rebelde (Rebel Voice), on the web. The page has since been used to issue demands, conduct interviews and even relay pictures from the inside of the compound: dramatic do-it-yourself images of the kidnappers, broadcast to the world. The guerrillas are the highest-profile example of a recent trend among rebel political groups to use the *laisser-faire* ethics of the web to communicate their views.

Before the MRTA, Zapatista rebels in Mexico and the MRTA's enemy, the Shining Path, had used the web for similar ends. In September 1996, the Revolutionary Armed Forces of Columbia backed its offensive against a military base with net reports, until the government pulled the plug. The MRTA's communiqués, which anyone is free



Left The MRTA home page — guerrillas with a message for the world. Well, quite a few messages, actually

Below More Nationalism, but of a more savoury kind. The Scottish Nationalists have a well-ordered site with mulitmedia and an endorsement by Sean Connery

to read on the web site, make fascinating reading. "The repression against the men and women of the free press has left only pro-government journalism that puts a gag on itself as a means of survival," says international representative, Isaac Velasco, asking sympathisers to email the government of Peru. Because the page is hosted outside Peru, the government is powerless to stop it.

It's not just revolutionary guerrillas that have taken to the web to explain their politics. Everyone from the Natural Law Party to the Klu Klux Klan has a site dedicated to their political views. Of course, if politicking on the web really worked, then no-one would have to take hostages to get the world's attention. With less than a million people with internet access in the UK, the web has a limited effect on public opinion. But it is influential enough — especially with those political prize voters, the kids — that few political parties ignore it. Also, the web has proved a method for political organisations to issue rapid rebuttals, denials or policy statements. New Labour has an area specifically dedicated to rebutting unfavourable coverage. The Scottish Nationalists issue snapshot opinions on everything from a political assembly to the new Royal Yacht.

Politicians no longer have to wait for parliament to open or the press to call on them before they give an opinion. At some time before 22nd May, we're going to have a general election — the first election of the internet age. Not surprisingly, all the major parties want to capitalise on the immediacy of the web to score a propaganda victory. All three mainstream political parties now have largescale web sites which are gearing up for the election *(see page 218)*.

Among the smaller parliamentary parties, perhaps the best site — as professional as anything you'll find from the "big three" — is the Scottish Nationalist Party's home page. Scroll down from the shot of leader Alex Salmond MP, and there's a familiar face — it's Sean Connery, right eyebrow quizzically raised. "What we seek for Scotland," Connery says, "is the normal status of a small ancient nation." This small ancient party has the nous to use the web

p218 ➢

ambitiously, with information for outlying Scottish regions and even QuickTime movies. Down and to the left, Plaid Cymru uses its web page to provide bilingual information: the home page is in Welsh, but you can link to a mirror site in English.

It's on the fringes of political activity, right, left and left-this-planet, that some of the most impassioned and surprising political information and invective can be found. If you have an opinion, someone out there shares it. And at least six others violently disagree with it. The largest growth area for politics on the web has been on the extreme right, especially among nationalist movements. Whether or not you consider this politics or just old-fashioned racism, many people are using the web to propagate beliefs that have been excluded from the mainstream media. From the odious race-hate of the Voice of White America ("The White Man must retake his country. There is no time for fear. We all must stick together and rise") through the more guarded assertions of "nationalist" organisations like Crosstar, the far right luxuriates in the freedoms granted by the lack of political censorship on the web.

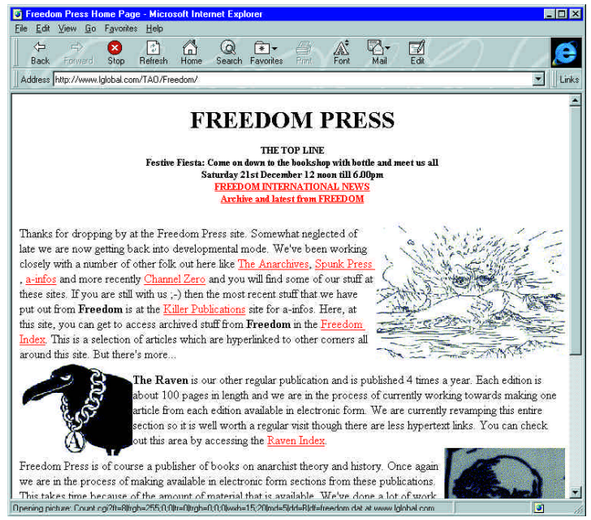
Richard Barrett, General Counsel for the American-based "Nationalist Movement" (www.nationalist.org) thinks that the traditional media is becoming more hostile to his views, and the web allows him to expound those views in a way that otherwise he couldn't. Surprisingly, for an organisation that in the UK could be accused of incitement to racial hatred, he isn't anti-censorship; rather, he believes that people who disagree with him should be silenced on the web. "The web has a contribution to make to politics, provided that the discussion is not subversive or obscene," he says, "We back laws which will ban subversive and pornographic materials on the internet entirely. We support the Fist Against Filth Campaign, as well as the Communications Decency Act." He supports censorship of "subversive, communist, threatening, harassing, perverted" material, which in view of some of the comments of visitors to the site, might safely be described as ironic.

The far right is represented by only one UK-based home page which claims no party allegiance, instead calling itself the "British Nationalists Home Page". It is certainly diligent at combing the print media and the net for supportive comments, and the page editors (who prefer anonymity) aren't apologising. "We would not accept that we are outside the mainstream," they told *PCW*. "The media is largely a monolith which blocks all views outside a narrow approved range." The argument is, then, that other opinions are not heard because they are illegitimate or have no support. Noam Chomsky calls it "manufacturing consent", with self-censorship by journalists rather than overt control. "What we say generally is thought by millions, even if they are silenced by fear at the moment."

While they grant that their views on the holocaust (they don't believe it happened) would fall outside this silent majority, this is, they believe, only because people know too little to judge, which, of course, they are trying to use the web to correct. Despite their opinions, which most internet users would find unpalatable at best, the British Nationalists epitomise a belief of many net users that runs counter to prevailing political thought: that no matter what you think, on the internet you have a right to think it, and to tell people about it.

This has tricky ramifications for the censorship debate, currently centred around pornography *(see page 220)*. The British Nationalists are happy (even if they don't sound overjoyed) with this state of affairs. "The coming big issue for society is totalitarian censorship and control, overt or indirect." They add: "The web will play an increasing role as the equivalent of the 'Underground Press' during the sixties, if the media refuses to admit a wider spectrum of viewpoints. We are happy to see the left or anyone else put across their arguments on the web. It is they who want to censor everyone else. They are out of tune with the times, and particularly the web, which people join specifically to speak freely."

Leading the battle against the far right, we find the anarchists. The internet is often touted as a state of anarchy, as people willingly provide resources without an overall "governing body", but compared to the mushrooming of far-right activity on the web, there aren't many anarchist resources. Freedom Press, hosted by a political organisation called the Media Collective, is probably the largest anarchist resource. "An alternative world of creativity and freedom," promises the blurb. "Education accompanies the transformation as the living language flows among free people." Despite the happy talk (a welcome breath of fresh air after the fetid atmosphere of the p220 ➢



The revolution starts today, says the Freedom Press. More details here

Seconds out, it's the general election

A cynic (this is politics, after all) might observe that the most remarkable feature of the three web sites hosted by the three leading political parties is how similar they are to each other. This doesn't just apply to content, because after all, that's understandable: they're all dealing with the same subject. What's more surprising — or significant — is that they all use the same basic design and format: even the colour schemes are similar.

The Conservative Party site opens with a welcome from John Major, who wins the Technology Chutzpah Award, claiming the internet for the Tories. "Every breakthrough in communications technology this century has started under Conservative governments," he writes. "It's not surprising the UK has more people connected to the internet than any other country in Europe."

You can't argue with logic like that. The site has a collection of information about policy, people and the party organisation, but adds an online magazine called The Messenger (at the time of writing this was several months out of date) and, hidden away in a frame at the bottom of the page, a multimedia area. If you want to watch a video of the Prime Minister answering questions at conference, or watch Phillip Oppenheim MP in action, you're in the right place.

Labour's web site could be branded the "Not The Conservative" web page. Larger than the "New Labour" logo on a restrained front page are warnings about what the Conservatives could do to us. A little deeper into the site, and you think you've accidentally switched back to the Tory pages: there's the Union Flag fluttering against the same beige background of the Conservative site. New Labour has less to offer if you're looking for multimedia, but it has more depth, more policy information, and more contacts to reach by email. There's a shop too, and an area dedicated to giving Labour's "spin" on current news stories.

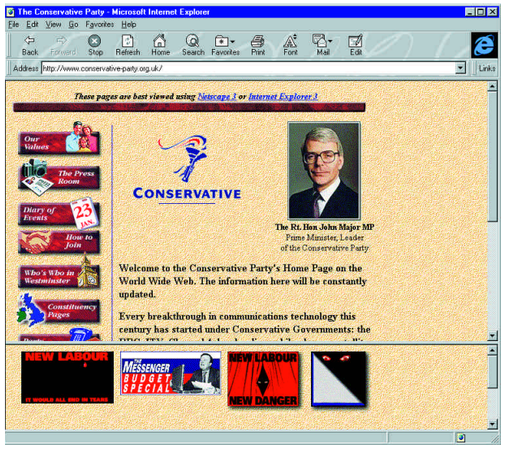
Labour knows the risks of running a web site: in December 1996, hackers called the Digital Anarchists broke into the site and changed Tony Blair's image to that of his Spitting Image puppet. Labour's response to the budget was replaced by a live sex show, and the headline to "New Labour -— same politicians, same lies". It may not have been the most subtle hack, but the Digital Anarchists are threatening to hit other main political parties, which should liven up some of the more tedious pages on all three sites.

The least slick of the three, the Liberal Democrats (again with a yellow background, although it *is* their party colour) have a site that's probably the easiest to navigate. "We are on the web because it represents the future of communication and information," says a rugged-looking Paddy Ashdown. According to his spokesman for science and technology, Nigel Jones MP, Ashdown knows his stuff. "It helps having a leader who is computer literate and a visionary," he said. "Liberal Democrat thinking is much more advanced than that of either of the other parties."

If this is true, there's little evidence of it, apart from the fact that Liberal Democrats are by far the easiest to reach via email. The major political parties are using their web sites to disseminate information rather than pursue more ambitious social or political projects using the net. But as the Digital Anarchists taught Labour, the net can be a more demanding audience, with its own way of voting.

.....looking suspiciously like New Labour

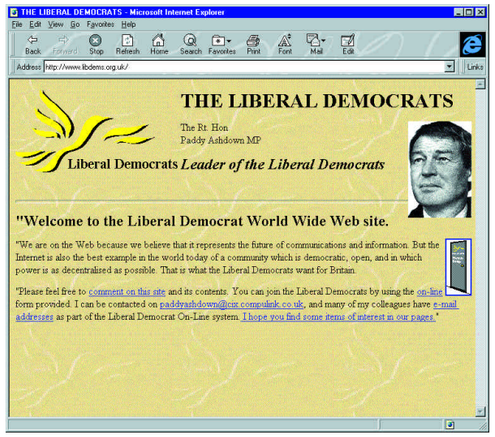
The Conservatives at home.....



British Nationalists), Freedom Press's representative doesn't think the web will change the world. "We are simply publishing things on the web that have already been published in other media, but I feel we are reaching more people we might not otherwise reach, like you for example. We are perhaps more active in email, which we prefer." Freedom Press doesn't run a flashy page full of soundbites. "To be reported on by the media is simply to be part of the spectacle. We are not interested in passive participation — we hope people will seek to act as a result of what they read and learn."

Why not use the internet to make converts, like the right? Won't the web have a long-term effect on politics? The answer is: "Who cares? The revolution is today".

In case you wake up tomorrow and the revolution hasn't happened, you might fancy an excursion into the world of lost-cause ballot-box politics. Although hardly what you'd call "ready for government", political parties like the Natural Law Party, the Referendum Party and the Third Way are using the web as a cheap way to disseminate information, leaving more money to pay for lost deposits when it's time to vote. Less threatening than the extremist pages, spanning views from the earnest to the charmingly eccentric, they all have one thing in common: they regard the net as a way to right the distortions and jibes of mainstream media.



The Liberal Democrat site is probably the easiest to navigate, even if it is less slick than the other two major party sites

Who typifies this more than the Natural Law Party, butt of countless Yogic Flying jokes in the 1992 election? Stuart Withers, chairman for the North of England, who helps maintain the party's web site, is enthusiastic against the odds. "We can maintain a regularly updated statement about our policies and campaigns. The international presence is brilliant, as we exist now in 50 countries," he says. "It is sad that the media do not appear to like democracy, in the sense that they do very little to present our case and are very inaccurate when they do. As a result, very few people are aware of our platform."

Withers sees the internet as a minority interest but one that attracts a high calibre of response, and potential activists. He's not in favour of censoring the internet, preferring to try and solve the root problem. "I can understand that some people are afraid of chaotic situations — they see dangers there. They are right, but they don't understand the mechanisms. The cause of the chaos is incoherent national consciousness. That's why some countries are affected more than others." But what's the solution? "The solution is therefore to create coherence in national consciousness, by establishing groups of yogic flyers." And if you want to know how to do that, you'll have to visit the web page.

So is the web a potential world parliament where we'll thrash out all our problems, agree a solution, do away with governments and still have time for a quick game of deathmatch Quake, or is it a conduit for minority nutters who like to shout loudly?

While it's a way to cut through the posturing and soundbite culture to explore the background of world politics, the web doesn't do much to further political debate: when you visit each site, you're effectively listening to one opinion at any time. Because of this, many sites appeal to those who already believe in what they propose — visit the chat area of the Voice of White America for confirmation of this, which isn't a chat, it's a yobbish, racist rant.

On the internet, the medium isn't the message. You can't kiss babies, evade questions or hog the limelight. In some ways, it's a return to the rough, issues-based politics our parents knew. Initiatives like the online election for schools and Steve Coogan's lesson in how to register to vote, mix politics and education. When conventional soundbite campaigning threatens to send you to sleep in this election, the political areas of the web make compelling, amusing, inspiring and appalling browsing. They remind you of what the creators of the net wanted: free and frank discussion. If they're not the most technologically innovative parts of the web, that's because for most sites, content is still more important than packaging. ■

The thought police: do we need them?

The internet isn't governed by the laws of any one country: its unique advantage is that it crosses all boundaries of geography, culture, age, race and sex, allowing anyone to express their opinions. Political freedom of expression is long regarded as a good thing. But should that freedom on the internet give a platform to racists, terrorists and revolutionaries, right and left wing? Currently, it does.

This cherished freedom relies on the "common carrier" status of internet service providers. That means an ISP is treated in law like a phone company, which cannot be prosecuted for the content of conversations you have on the phone because it has no control over what you choose to say. A UK-based ISP would not be liable for the contents of a neo-Nazi site, for example, but if the same statements were published in *PCW*, the magazine could be accused in British law of the crime of "Inciting Racial Hatred".

Kicking political extremists off the web is impractical too. Who administers it? Which country's laws would be used? And most importantly, where do you stop? The MRTA have broken Peruvian law by taking hostages: should they be given a platform to explain themselves? Do you censor their guerrilla opponents, the Shining Path, too?

Many bodies, such as the Internet Frontier Foundation (www.eff.org) take an anti-censorship position. The UK's ISPs, generally speaking, are trying to be more pragmatic. Both the Internet Service Providers' Association (ISPA) and London Internet Exchange (LINX) support the efforts of the police to encourage limited censorship. So far, this has concentrated on child pornography, but as LINX chairman, Keith Mitchell, admits, politics will be next.

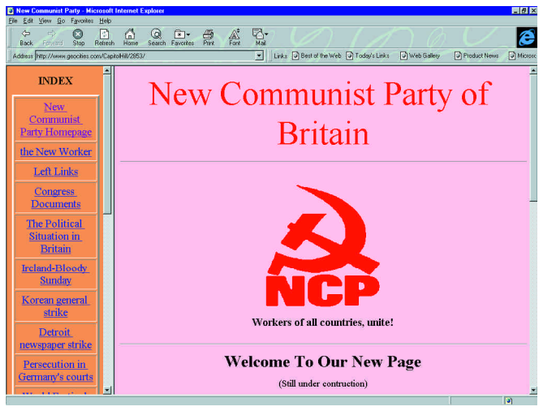
"LINX policy is that its members should remain within the law, and that the laws for cyberspace should be as consistent as possible with laws for all other aspects of everyday life," he says, "It was decided to tackle child pornography first because the media and presumably the general public regarded this as the most serious problem, and also because the legal definition of child pornography was most clear cut. It is the intention to extend reporting activities to other types of criminally illegal content, which could certainly include incitement to racial hatred."

The mechanism used in the UK is the Internet Watch Foundation (IWF), set up by former Pipex MD, Peter Dawe, in December 1996. Internet users report offensive material to the IWF, who then ask participating ISPs not to store the material on their servers and may pass the complaint to the police if the perpetrators are UK based. It doesn't take the material off the net, it just makes accessing it harder. Already, IWF has passed on five reports of illegal postings on Usenet to the police.

"If material published on a web site or in a news group breaks, for example, the Race Relations Act," Mitchell explains, "a member of the public could complain to IWF, who, if they felt there was a case, would notify LINX members and the authorities that there was potentially illegal material being published. LINX members would then be in a position to decide whether they wanted to take action to remove this material to protect their customers."

While Mitchell claims that this will boost the ISP's claim to be a "common carrier", others see this process as fatally undermining it and freedom of speech. Currently the best example of how the internet can tie a country's political censorship laws in knots comes from Germany, where it is illegal to sanction, or teach others, how to commit a crime. The result? Police have decided to charge a left-wing politician called Anna Marquardt for putting a hyperlink on her home page to the site of "Radikal" magazine. Radikal published information explaining how to sabotage railway lines.

This follows an earlier incident where the German police tried to prosecute CompuServe. The crime? As an ISP, it offered access to a Canadian Holocaust revisionist site; denying the Holocaust is also a crime. The case was dropped. Ironically, Radikal magazine itself is safe: its site is hosted just down the road in the Netherlands.



The New Communist Party home page

URLs

MRTA Solidarity Page
burn.ucsd.edu/~ats/-mrta.htm
Shining Path www.csrp.org/csrp.htm

Mainstream UK politics

Conservative Party
www.conservative-party.org.uk/
Labour Party www.poptel.org.uk/labour-party/
Liberal Democrats www.libdems.org.uk/

Fringe Parties

Scottish Nationalists www.snp.org.uk
Plaid Cymru www.plaid-cymru.wales.com/
Referendum Party www.referendum.org.uk/

Lists of UK political links

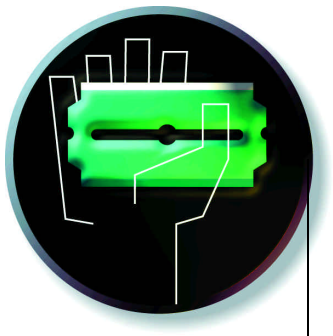
UK Directory, government section — local and party links for the UK
www.ukdirectory-.com/gov/index.htm
UK Political Links — ordered by subject with a site of the week
sun1.bham.ac.uk/turnersj-/pollinks.html
Julian White's British Politics Index — the biggest and best, with more than 1,000 links including temporary sites www.keele.ac.uk-/depts/po/table/brit/brit.html

Extremists

British Nationalists Home Page
ngwwmall.com/frontier/bnp/
Crosstar www.nationalist.org
Freedom Press
www.lglobal.com/TAO/-Freedom/
Voice of White America
members.aol.com/tsaukki/whiteamr.html
New Communist Party of Britain
www.geocities.com/CapitolHill/2853/homepage.html
Natural Law Party www.u-net.com/~natlaw/

Educational links

Register to vote in Manchester: Steve Coogan and Caroline Aherne (Mrs Merton) show you how.
www.manchester.gov.uk/-register_to_vote/
Online election for schools www.campus.bt.com/CampusWorld/election97/



Data collection

Ian Wrigley, on good form in part II of his teach-in on CGI, delves deeper into common gateway interfaces, explaining how to accept and process information off a web page.

Last month we looked at creating some basic CGIs for counting hits to a particular link on your web page and redirecting users to another location. This time, we'll take CGIs further and explore how to accept and process input from a form — a common requirement, whether you're implementing an on-line guest book (but please don't, they are almost always filled with inane and pointless rubbish!), requesting comments, or creating a complete on-line shopping mall. As with our examples last month, the CGIs presented here will be written in C, simply because it is probably the most common language used for creating CGIs. However, do remember that you're not restricted to C — Perl is another common language, along with many others that are used. Another reason for using C is that there happens to be a rather excellent C library, available free on the internet, that will make your CGI-writing life much easier.

In the library

The library, called **cgihtml** and written by Eugene Eric Kim, provides a ton of function calls to accept input from a form, parse it, and process the results. The library also includes plenty of functions that will aid writing out the HTML that you will produce after you have processed the form; all in all, it's an invaluable tool in the C programmer's repertoire. You can find on-line documentation for the library at http://hcs.harvard.edu/~eekim/web/cgihtml/. The documentation tells you where you can download the actual code; it's available in PKZipped, gzipped and Unix Compressed formats, so you should have no problems obtaining and extracting it.

Once you have compiled the code for your system, you are ready to go. A good first trial of the system would be to compile and try out the program in Fig 1 *(p224)*. This is a very simple CGI which just prints out the environment variables passed to the CGI. Although fairly trivial, you can see already that **cgilib** provides some useful features. All the standard CGI environment variables are stored as constants, so you can access them easily from within your program. Just use the **getenv()** system call in C, or whatever is the equivalent in your language. For a simple example, Fig 2 *(p224)* simply prints out the name of the server, which is stored in SERVER_NAME.

Notice that in both programs we have included **cgi-lib.h**, the header file for the routines. In order to actually run the programs, you need to store the compiled code in your **cgi-bin** directory and call it by accessing the URL www.yourserver.co.uk/cgi-bin/yourprogname. If you're having no luck, talk to your system administrator to make sure that you are actually able to access CGIs, because some systems only allow access to a particular subset of programs. Additionally, it's worth noting (at least on a Unix system) that you may well have problems if you try to run either of the programs directly from the command line. This is because until they are called via a web server, the environment variables are not set; so, at least on a Sun SPARCStation, trying to run the programs directly results in a core dump.

Why on earth would you want to use environment variables such as SERVER_NAME? Well, consider a situation where you are dynamically creating URLs to be written into an HTML page created by your CGI; perhaps because the program is a search utility that has catalogued all the pages on your site. The URL needs to be of the form http://yourserver.co.uk/filename.html. But if you hard-code the yourserver.co.uk bit, your program is not at all portable; move it to a different system and you'll have to edit the source code. But if you use the environment variable instead, suddenly you can move the program to any web site you're maintaining and it will still work. It's all about portability.

On forms

Accessing the environment variables can be useful, but it's in the handling and

p224 ➢

Fig 1 Printing environment variables

```
/*
 * printenvironment.c version 1.0
 * By Ian Wrigley
 *
 * Prints out the server environment variables
 *
 */
#include <stdio.h>
#include "cgi-lib.h"
int main(void)
{
  printf("Content-type: text/html\n\n"); /* To start the HTML */
  printf("<HTML><HEAD><TITLE>Environment variables</TITLE>
</HEAD>");
  printf("<BODY><H1>The environment variables...</H1>");
  print_cgi_env();
  printf("</BODY></HTML>");
  return 0;
}
```

processing of forms that **cgihtml** really comes into its own. Before we start, it's worth taking a quick look at the creation of the forms themselves. Fig 3 *(p226)* contains a typical HTML form; this one asks for your suggestions on the quality of the web site.

There are a couple of things to notice. The first is that two different types of form element are used: a text box for a single-line input, and a text area for multi-line input. The second thing is the line near the beginning of the file which defines which CGI will be called when the "submit" button is pressed, and how the data should be passed to the CGI (the METHOD section).

METHOD matters

It is worth taking a slightly more detailed look at that METHOD tag. You have two basic methods for passing data to your CGI: GET and POST. The former is the easiest to understand but it is rather basic and seldom used for anything but the simplest CGI. If you pass your data to a CGI using GET, it is placed in an environment variable called QUERY_STRING. But things aren't quite that easy; before the data is sent, things like spaces are encoded. Also, since all the form elements need to be passed in the same string, they are concatenated with an ampersand (&) between each "name=value" pair. For example, a form which had two simple text boxes, one called "yourname" and another called "companyname", would, when submitted via GET appear like this:

```
firstname=Ian&companyname=Wide%20Area%20Communications
```

Although languages like Perl can split such entries into a list fairly easily (using the **split**() function, if you're interested), C and others will have a harder time. And we've still got to deal with the decoding of bizarre entities like "%20" which needs to be turned into a space.

The other limitation with GET, perhaps the most major one, is that it can only reliably pass 255 characters to your CGI. For that reason alone, it's far better to use the POST method. This allows unlimited amounts of data to be passed, and although it can be slightly more difficult to access the results, the **cgihtml** library provides us with some very easy-to-use function calls that make the whole thing very easy. In other words, the recommendation here is to use the POST method for all except the simplest CGIs you write.

Fantastic functions

So let's take a look at the procedures we use to read the data from the form in Fig 3. The CGI to process this data is in Fig 4 *(p226)* and since it's more complex than any of the ones we used last month, we'll go through it step by step.

First of all, we include **cgi-lib.h**, since that's the **cgilib** header file we need. Of course, since we're printing things out, we also need **stdio.h**.

- Step 1 in the listing is the first new idea: we define the variable **information** as being of type **list**. This is a data type defined in **cgi-lib.h** and is basically a list that can store the data read-in by the CGI. Don't worry; we never normally need to access this variable directly, since we are given a set of handy functions that operate on the variable.
- After printing some basic stuff (don't forget to output the **content-type** line, otherwise your browser will complain) we get to Step 2, where we call the **read_cgi_input** function. This function takes the input supplied to the CGI (whether it's

Fig 2 Printing out the name of the server

```
/*
 * printservername.c version 1.0
 * By Ian Wrigley
 *
 * Prints out the name of the server
 *
 */
#include <stdio.h>
#include "cgi-lib.h"
int main(void)
{
  printf("Content-type: text/html\n\n"); /* To start the HTML */
  printf("<HTML><HEAD><TITLE>Server name</TITLE></HEAD>");
  printf("<BODY><H1>The server name</H1>");

  printf("The server name is %s", getenv("SERVER_NAME"));
  printf("</BODY></HTML>");
  return 0;
}
```

p226 ➢

supplied via the GET or the POST method), and places it in the variable **information**. We need to pass the function the address of the variable (hence **&information**) since a function can't directly alter its parameter variable. (If this doesn't make sense to you, now is probably the time to take a quick refresher in C.)

When **read_cgi_input** returns, it passes back the number of entries it returned or a zero if it didn't read any. That is why we can put it in the **if** statement and directly check to make sure that at least one value was returned.

■ Assuming this was the case, Step 3 calls a function **print_entries**, which simply prints out the name and value of each item in the **information** list. (A good example of a simple function that actually does some fairly hard work.)

■ If no entries were read, the **else** clause comes into effect and in Step 4 we print out an error message. Then we just write the end of the HTML document.

A little more control

This is all very well, but normally we'll want to do slightly more than just echo the results of the form to another HTML page; for instance, we might want to take the value of individual form items and do something, depending on their contents. Fig 5 *(p228)* does just that: it reads in the form entries from Fig 3 and uses one of them (**name**) to determine what to output.

Much of the program is very similar to Fig 4, but we introduce a new function call in Step 1. This function is **cgi_val**() and it simply returns a pointer to the value of the item named as its second parameter. In this case, the whole line states: "Take the list of data called 'information', find out where the string returned as the data for the form element 'name' is being stored, and make variable 'whoisit' point to that location". In other words, when the line is complete, "whoisit" will be pointing to the name entered in the form. It's worth noting that we are not doing any error checking here, but in order to make your CGIs bullet-proof, you need to make sure that some data was actually returned; if none was, the function returns the null string, so that's what you should check for.

The rest of the program is quite prosaic. The **strcmp**() function is a standard C function call, which returns a zero if the two strings match: if they do, then the HTML page will welcome you, otherwise it will tell you that it doesn't recognise your name.

The **cgi_val**() function is extremely handy, and is used all the time when you're writing CGIs. The real point to watch out for, though, is to make sure that it has returned something useful, rather than the null string: if someone doesn't type any data into the form, that's what you'll get; and if

Fig 3 A typical HTML form

```
<HTML>
<HEAD>
<TITLE>Comments please</TITLE>
</HEAD>
<BODY>
<FORM ACTION="/cgi-bin/processform" METHOD=POST>
<H1>What do you think of our site?</H1>
Your name: <INPUT TYPE="text" NAME="name">
<P>
Your e-mail address: <INPUT TYPE="text" NAME="email">
<P>
Your comments on our site:
<TEXTAREA NAME="comments" ROWS=8 COLS=80>
</TEXTAREA>
<P>
</FORM>
</BODY>
</HTML>
```

Fig 4 CGI to process data from a form

```
/*
 * processform.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates
a new HTML page containing the results
 *
 */
#include <stdio.h> /* Of course... */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
 llist information; /* STEP 1 */
 printf("Content-type: text/html\n\n"); /* To start the HTML */
 printf("<HTML><HEAD><TITLE>Results!</TITLE></HEAD>");
 printf("<BODY><H1>Your results</H1>");
 if (read_cgi_input(&information) != 0) /* STEP 2 */
 {
 print_entries(information); /* STEP 3 */
 }
 else
 {
 printf("No input!"); /* STEP 4 */
 }
 printf("</BODY></HTML>"); /* End the HTML */
 return 0;
}
```

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Fig 5 Reading form entries to determine output

```
/*
 * whoareyou.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates a new HTML page.
 * The contents are determined by the value of the variable 'name'
 *
 */
#include <stdio.h> /* Of course... */
#include <string.h> /* for the strcmp() function later */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
  llist information;
  char *whoisit; /* Pointer to be used later */
  printf("Content-type: text/html\n\n"); /* To start the HTML */
  printf("<HTML><HEAD><TITLE>Hello!</TITLE></HEAD>");
  printf("<BODY><H1>Hello</H1>");
  if (read_cgi_input(&information) != 0)
  {
        whoisit = cgi_val(information, "name"); /* STEP 1 */
        if (!strcmp(whoisit, "Ian")) /* STEP 2 */
        printf("Hello Ian!<P>");
        else
                printf("I don't know you!");
  }
  else
  {
        printf("No input!");
  }
  printf("</BODY></HTML>"); /* End the HTML */
  return 0;
}
```

you don't check, your program will probably crash somewhere later on.

There are plenty of other function calls that **cgihtml** provides to deal with input from your forms; the on-line documentation lists them all and there are some example programs included in the package to help you understand what's going on. One worth noting is the **die()** function. This allows your program to exit elegantly if a problem occurs, rather than crashing or running forever in the background, taking up processor time and slowing you down.

Signal handling is not pretty in C, but it's very easy to use in simple cases. Just put

```
#include <signal.h>
#include<unistd.h>
```

at the top of your program, and the following lines in the body:

```
signal(SIGALRM, die);
alarm(30); /* die if processing isn't done in 30 seconds */
```

Assuming your operating system handles signals, supports the **alarm()** function call and recognises the SIGALRM signal, these two lines of code basically call the **die()** function 30 seconds after the program starts. Thirty seconds is far longer than any but the most complex CGI will take, so if it's still running at that time, chances are you have a problem in your code so you should exit as quickly as possible.

Writing out HTML

The **cgihtml** library doesn't just provide functions for accepting input, though; cgi-lib's companion library, **html-lib**, has several functions which make writing your output page easier, too. Fig 6 *(p230)* demonstrates a number of them, and although none are particularly earth-shattering, they do speed life up for you.

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Fig 6 Functions for easier writing of an output page

```
/*
 * whoareyou.c version 1.0
 * By Ian Wrigley
 *
 * Accepts data from the form in Listing 3 and creates a new HTML page.
 * The contents are determined by the value of the variable 'name'
 *
 */
#include <stdio.h> /* Of course... */
#include <string.h> /* for the strcmp() function later */
#include "cgi-lib.h" /* Needed for the function calls we're
demonstrating */
int main(void)
{
  llist information;
  char *whoisit; /* Pointer to be used later */
  printf("Content-type: text/html\n\n"); /* To start the HTML */
  printf("<HTML><HEAD><TITLE>Hello!</TITLE></HEAD>");
  printf("<BODY><H1>Hello</H1>");
  if (read_cgi_input(&information) != 0)
  {
        whoisit = cgi_val(information, "name"); /* STEP 1 */
        if (!strcmp(whoisit, "Ian")) /* STEP 2 */
                printf("Hello Ian!<P>");
        else
                printf("I don't know you!");
  }
  else
  {
        printf("No input!");
  }
  printf("</BODY></HTML>"); /* End the HTML */
  return 0;
}
/*
 *
 * printpage.c version 1.0
 * By Ian Wrigley
 *
 * Prints out a page using html-lib
 *
 */
#include <stdio.h>
#include <html-lib.h>
int main(void)
{
  html_header();
  html_begin("A sample page"
);
  h1("Hello, world!");
  h4("Text in header 4 style"
);
  html_end();
  return 0;
}
```

The first function call is to **html_header**. This simply prints out the **Content-type** line for you, so all your programs should include this as the first thing they print. Next, **html_begin** prints out the standard HTML tags **<HTML><HEAD><TITLE>**, then the string you supply to the function, then **</TITLE></HEAD><BODY>**.

Graphical buttons in forms

Rather than using the standard buttons, it's possible to use a picture instead. You do this by using the **<INPUT>** HTML tag, *viz*

```
<INPUT TYPE="image" NAME="
sendbutton" SRC="sendbutton.gif"
 ALT="Send" VALUE="Send">
```

Here, we are saying that the image (**sendbutton.gif**) should act like a button; when clicked, it will send the data to the CGI. Just by using a technique like this you can radically improve the look of your forms, replacing the boring old buttons with cool icons. Even better, you can put two or more graphical buttons on the page and give each a different name. Then you can set your CGI to see whether a given button has been hit.

But wait; how do we do that test? Well, it's our old friend **cgi_entries**. But there's a catch. When you click on a graphical button called, for instance, **sendbutton**, what is actually passed to the CGI is information about where on that button the user clicked, in terms of the x and y co-ordinates. So you can't just check to see if **cgi_val(information, "sendbutton")** is not null — it always will be, since no entry called **sendbutton** is returned. Instead, two others (**sendbutton.x** and **sendbutton.y**) are passed back, giving the x and y co-ordinates of the place the user clicked. So to see if the sendbutton was pressed, you need to use something like this:

```
if (cgi_val(entries, "sendbutton.x
"))
{
      /* sendbutton was pressed, so
do something */
}
```

Since sendbutton.x will only have a value if the user clicked on this button, the **if( )** condition will be true and you can carry on.

PCW Contact

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net.news

Around the web world with PJ Fisher.

‘Catcher’ creator cornered

■ Fans of JD Salinger were alerted to his first new book for over 30 years by a buried listing for *Hapworth 16, 1924* on the pages of Amazon.com, the web-based book store.

The publicity-shy author has banned any form of promotion for the new book, which is being published by an independent press. The listing for the new title was among Salinger’s other books, including his most famous, *The Catcher In The Rye*.

Hapworth 16, 1924 is not yet available but can be pre-ordered from the Amazon site.

www.amazon.com

ISPs bid to link China

ISPs are bidding to give China its first internet gateway links to the rest of the world, but the country will have its first nationwide intranet by the end of 1997 due to a deal between Bay Networks and Beijing’s state news agency.

The deal will cover 20 Chinese cities by the end of the year, expanding to 50 next year. The intranet system will be known as the China Wide Web, with services targeted at businesses rather than individuals.

The intranet will carry business information, email and some web pages, but the construction of a Chinese internet gateway will be awarded to an international ISP once the bids have been assessed. Sources could not confirm which companies were in the running.

For the China Wide Web deal, Bay Networks will provide the network design, hardware, software and engineers’ training, but the company refused to reveal how much the contract is worth.

Up to two million businesses would be interested in the service, according to Michael McLeod, sales and marketing director at China Internet, a company controlled by the Beijing state news agency. Implementation of the scheme should now be under way in Hong Kong, Shanghai, Beijing and Guangzhou.

James Harding, VNU Newswire

Little Brother is watching you

■ Remember how your little brother would snitch to your mother when you did something wrong? There is now an electronic version waiting to inform your boss exactly where you have been on the internet.

Little Brother, produced by the Kansmen Corporation, is claimed to be the most advanced web-monitoring software currently available. It allows network managers to see which web addresses employees visit and the size and identity of any files downloaded from the internet. Plus, if necessary, access to individual sites can be blocked.

The company claims that by empowering individual control of web access it will prevent government action to ban certain web content — porn, for instance. It also sounds like the kind of tool that megalomaniac network managers have been dreaming of, with its ability to identify who has been where and doing what on the web.

Kansmen Corporation

www.kansmen.com

net.surf

Peek at the geek

■ Geek Girl is a funky little site, set up by a self-confessed girl geek. As well as being funny, the site also hosts a wealth of techie information including a complete guide to the mysteries of UNIX and beyond.

Geek girls and boys should rush over and thank Geek Girl profusely for such a show of unashamed pride in being a geek. Oh, and by the way, geek boys… she’s attached.

www.geek-girl.com/

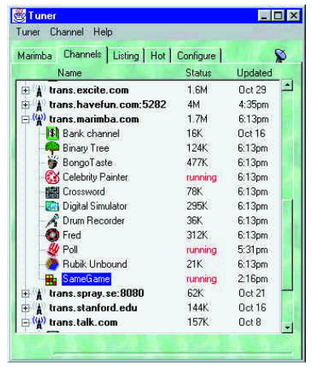
Castanet clicks with Dimension X

The next step for “pushed” information across the web will include Java-based applications as well as the familiar stock-tickers and news headlines accessible through PointCast and similar services. Two companies, Marimba and Dimension X, have joined forces to make the creation and delivery of Java applications easier for software developers who are keen to take advantage of web delivery.

Marimba has developed Castanet, a system for broadcasting data and applications across the internet, direct to users’ personal computers. It also markets Bongo, a Java-based visual development environment for creating GUIs that needs significant Java experience in order to build complete applications.

Dimension X has developed its Liquid Motion Pro software which offers point-and-click Java programming to work with Bongo. Both companies hope that the combination will make it easier for designers to create exclusive applications for delivery on Castanet.

This is more evidence of a gradual shift to Java-based computing using the internet or TCP/IP-based intranets. Desktop users can “tune in” to Castanet and then select the applications (or “channels”) they need from a menu.



Marimba claims that the Castanet protocol makes it possible to distribute large, media-rich applications even over a slow connection. Once applications have been downloaded, they can be stored on local drives.

Corel is to deliver forthcoming beta copies of Corel Office for Java via Castanet channel technology, making it easier for testers to obtain the latest version.

A beta version of Bongo and the Castanet tuner are available from the Marimba web site.

www.marimba.com/

www.corel.com

www.dimensionx.com

Global offers free web space

■ Global Internet has announced that it is to give its customers 3Mb of web space, free. To access the pages, customers add their user-ID to a predetermined web address. They are then guided through a tutorial for online creation of web pages.

“We’ve made it easy and cost effective for them to create their own web site,” said Laurence Blackall of Global Internet.

www.globalnet.co.uk

Trouble brews down at the net café

■ The managing director of an internet café in Cheltenham, called “Netscafe”, has run into trouble with the Swiss food giant Nestlé over its name. He has received a fax from the Nestlé company which alleges infringement of copyright.

Managing director, Paul Alexander said: “I contend that this is not the case. Refreshments make up less than five percent of the business. I supply tea, coffee, soft drinks and refreshments; I do not serve Nescafé.”

He also contends that none of his customers have made the mistake of thinking that the café was in any way connected with Nestlé, despite the company’s claim that the café’s name could confuse its customers. Mr Alexander is now seeking further advice.

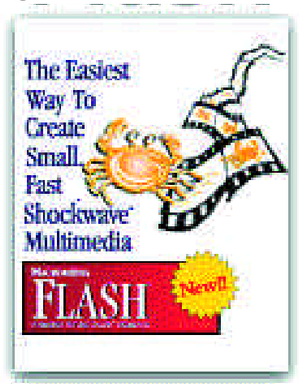
www.netscafe.co.uk

MacroMedia plugs in to FutureWave and gets Flash

■ Following the trend of large software companies swallowing innovative web software houses, MacroMedia has acquired FutureWave and has re-launched Flash, its class-leading web-animation tool. It now joins MacroMedia’s growing stable of web design products.

Flash allows creation of small animations that download faster than those created conventionally. It is designed to create and animate high-resolution vector graphics or import them from other graphic design tools like Adobe Illustrator or MacroMedia FreeHand.

For web users the Flash plug-in means that animations come down the web much faster, and should make animated sites worth viewing for those with limited modem access to the internet.



One of the keenest users of Flash has been Microsoft: its MSN site makes considerable use of it, as does CNET and the official “The Simpsons” site.

The Shockwave Flash player is 100Kb and freely available to web users from the MacroMedia web site. For developers, Flash is available now at a cost of £229 (plus VAT).

www.macromedia.com/software/flash/

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IBM files patents site

Hoping to demonstrate the practical applications of its own internet products, IBM has opened a free public web site holding two million US patent filings dating back a quarter of a century.

The database was developed by IBM for internal use by its own lawyers, to speed up the process of patenting its own innovations. But it decided to open up the Patent Server to outsiders as a demonstration of its technology and, it claims, as a public service.

The US Patent and Trademark Office offers abstracts of patents free of charge on the internet, but charges a fee to make the full text available. "[The Patent Server] saved us time and money," said Marshall Phelps, IBM vice-president for intellectual property and licensing, "so we thought it would be a valuable resource for the public as well."

At present, users accessing the server at www.ibm.com/patents can view a million patent documents dating back to 1987. Documents dating back to 1974 will be added during the next few months, with the eventual intention of offering patents from 1971 onwards. Full text search facilities, international patent filings and links to other patent data providers will be added over time.

IBM hopes that, if successful, the Patent Server will act as a practical demonstration that large databases can be hosted on the internet to be shared by large numbers of users. The company has provisional plans in place to post a second database, holding filings from the Federal Election Commission: in UK political terms, the equivalent of the register of Members' interests.

Meanwhile, at the Internet World 97 trade show in Canada, Mark Greene, IBM vice-president of electronic payments and certification, predicted that the company's internet-related product lines would break even this year with e-commerce proving to be the main driver.

Stuart Lauchlan, VNU Newswire

Intranet gets HiP with SoftQuad

SoftQuad has released the final version of its intranet package, HiP (HoTMetal Intranet Publisher). It moves the Canadian HTML specialists into the competitive groupware market. Building on its experience developing industrial strength HTML and SGML tools, SoftQuad is pitching HiP as a fully HTML-compliant intranet product for document distribution.

To turn standard HTML files into HiP documents, JavaScript is added to each page (which can be done using a batch file for large sites) and this activates the HiP plug-in reader. It splits the browser window into two panes: on the left is a Table of Contents (TOC) of the document, while the right-hand pane continues to display the normal web page.

HiP allows context-sensitive searches of the document instead of a normal sequential search on the web. Intranet users can get automatic updates for the web site using different parameters. For instance, a topic update defined by the user would alert them to new changes anywhere on the site. Users can also annotate documents after viewing them, and redistribute them on the intranet. Documents can also be given an "effective from" date or expiry date so that they only remain active on the site for a certain time.

For site managers HiP provides tools which are accessible remotely via FTP, and a colour-coded graphical representation of the site can be used to check broken links and identify documents. The package includes a copy of HotMetal Pro for web-page creation. SoftQuad is now developing version 4.0 of HoTMetal with a target release date for the end of 1997. Pricing for HiP starts at £349, with a ten-viewer pack (the plug-in) at £125.

www.softquad.com

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Web developer proposes bandwidth islands concept

A solution to the bandwidth limitations currently restricting development of net telephony and online shopping could be the "bandwidth islands" idea, proposed by new media publisher and web developer, Steinkrug.

The company sees potential for conventional content providers, like local newspapers and supermarkets, which are eager to tap into new markets selling services and advertising. While for the community, low-cost video-conferencing across the network could, for example, link GPs with their patients at home.

Such "islands" would, in effect, be private networks or community intranets with normal net protocols but, because they are isolated, not subject to the bottlenecks and bandwidth squeeze that afflicts the global internet.

Steinkrug's Peter Kruger said: "A local business magazine is one of the first clients to whom we are talking, and we have talked to several other newspapers."

The idea for bandwidth islands arose from research into community networks, funded by the EU.

www.gold.net/flames/

Apple offers MacOS JVM compatibility

■ Apple has released an implementation of Sun Microsystems' Java Virtual Machine (JVM), the software set needed to run Java applications under MacOS. Called MacOS Runtime for Java 1.0, it includes a player for running Java applications and an API for developers. This makes Apple and IBM the only manufacturers to offer JVM compatibility as part of their operating systems.

A QuickTime Plug-in for both Netscape Navigator and Internet Explorer is now available from the Apple web site. The plug-in supports the QuickTime VR "URL Hot Spot" feature as well as offering web developers control over QuickTime playback. They can define exact volume levels, movie scaling and local cacheing of files.

www.quicktime.apple.com

top ten websites

1 Spice Girls
2 FHM
3 No Sex, No Money, Just Football FC
4 The Computer Superstore
5 Cheap Flights
6 Damon Hill's Formula 1 Home Page
7 UK Laughter Links
8 British Airways Global Check-In
9 EasyJet Airline
10 Exchange and Mart

Chart as at 23/1/97. For the latest chart go to www.yell.co.uk. Yell's chart is based on the most popular web sites that Yell's visitors jump to.

Motorola trials faster cable modem

■ Motorola claims success having tested 200 CyberSURFER cable modems across the Manchester Nynex franchise area. Up to 10Mbps was available to subscribers on this network, making downloads faster than standard modems.

Now Motorola is aiming to extend this service by making cable modem access to the internet the norm. A new trial is taking place among 100 homes and small businesses in Basildon, Essex. The cable operator is Telewest.

Motorola says the UK cable industry is so advanced it could take a world lead in offering super-bandwidth to ordinary homes. The UK has state-of-the-art hybrid fibre coax pipe that supports bi-directional communication. In comparison, only 18 percent of US networks are so equipped.

Bi-directional communication is important for developing interactive web applications like web TV, video-conferencing and home shopping.

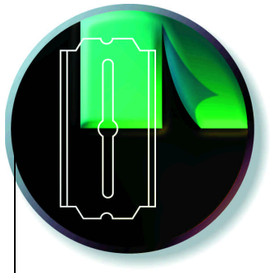
Notes.net

■ Lotus is the latest company to offer an offline browser with its release of Weblicator, available for download from the Lotus web site. But because of Lotus' work in developing Notes, and its Domino web server for intranet applications, Weblicator is designed to do more than just grab web sites for browsing offline. Lotus sees it as a way of boosting productivity by allowing employees to participate in web-based business applications, offline. For example, group workers can pull applications like spreadsheets or HTML documents off servers, modify them, then put them back on the server. The changes can be assimilated by a manager and passed on to the next person in the intranet chain.

Weblicator also offers standard off-line tools, full-text searches of web documents and an HTML-based user interface, allowing users to personalise web documents.

Weblicator is $29 and runs on Win95 and NT and any browser that supports frames.

beta.notes.net



Target practice

Nigel Whitfield explains the ins and outs of target attributes and how they tell the browser where to open a link. Plus erratic email speeds, where to chat and other net notes

Q *"I am working on a web site and am encountering difficulties with frames. If I click on a link in a frame, the site it links to turns up within the frame or in a separate window, never covering the same window whole."*

A. It sounds like you're not using the TARGET attribute in your web pages, which tells the browser where to open a link. There are some special options that can be used with this attribute to tell the browser whether to open the document in the current frame, a new window, or to collapse the current frame set to a single window.

Use the TARGET attribute like this, when you're specifying a link:

```
<a href="http://some.place/page"
target="targname">
```

Replace "targname" with the name of the frame that you want to load the page into, or "_self" to load it into the same frame, "_top" to load it into the full browser window, "_blank" to open a new browser window, and "_parent" to use the parent frame set of the current frame.

Home

Q "I am a new user of the internet from home, although I previously had the luxury of a speedy connection through my university service provider. Now that I am with CompuServe, accessing web pages from home can be painfully slow. My telephone line is shared with ordinary phones and an answerphone/fax machine. Is it possible that the latter, which is actively listening on the line during computer modem operations, could be slowing down transmission rates?"

A. No. It's quite unlikely that anything else on your phone line would be interfering with a modem in that way. However, you should check the REN — Ringer Equivalence Number — of everything plugged in and check that it doesn't exceed four, which is the recommended maximum. Even so, the only usual effect of exceeding a REN of four is that the phone won't ring properly. It's more likely that you're simply experiencing problems with CompuServe, especially since you had fast access through the university. It may be worth downloading the latest version of the CompuServe software, which you can access via GO CIMSOFT.

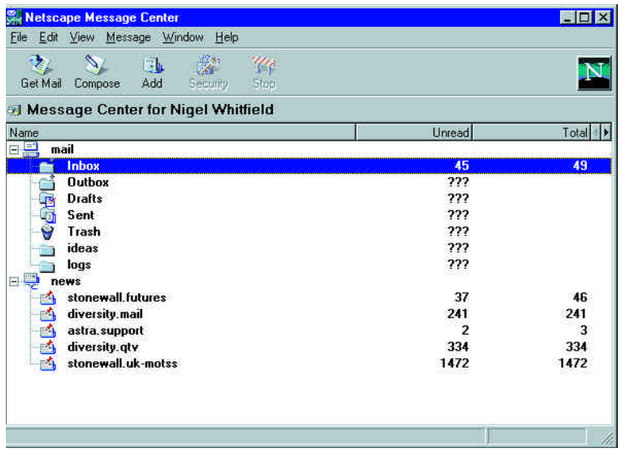
Own-blend software

Q. "I am having trouble finding an ISP who has access in both the UK and Canada, and who will allow me to use my own blend of software. CompuServe said that it would be against my contract to use my own software. I am sure a lot of people have the same problem. Can you help?"

A. You seem to have been rather misled by the people you spoke to at CompuServe. The service can be used with any standard TCP/IP software — in fact, there's even a script on the Windows 95 CD that allows you to use Windows Dial Up Networking to connect to the internet via the service.

If you're after international access, you should consider the Microsoft Network and the IBM Global Network, both of which are available in the UK and Canada; although if you wish to use your own software, IBM may be a better option. You may also wish to check with some smaller ISPs and see whether or not you'll be able to arrange the sort of access that you need by using a different company in each country.

If you collect your email via POP3, there's no need to use the same provider, since you can pick up your messages from anywhere, via any ISP. By shopping around for an ISP in each country, you may find a low-cost option that suits your needs better.



NetScape Communicator's email can tell you what's in your mailbox without having to download all the messages

Light out

Q. *"I currently use Eudora Light 1.5.2. which was supplied by my internet provider. As a newbie I only use it for simple messages, yet two irritating "faults" and one "lack" have given rise to the following wish list :*
1. I wish I could Check Mail and Send during the same connection.
2. I wish I could stop the prog determinedly redialling until a connection is achieved (Stop button offered is ineffective).
3. I wish the system could flag that I have mail waiting to be collected, before I attempt to connect.

Obviously, my frustration is in direct relation to the number of people also trying to connect at the same time. Is there a mail system that would satisfy my wishes?"

A. To address your points in turn; you won't be able to find a program that actually collects mail and sends your new messages at the same time, since the way that a mail program like Eudora works means there have to be two distinct connections made. However, having said that, there are some programs that give the impression of doing both at the same time, including the Internet Mail service for Microsoft Windows Messaging. If you're running Windows 95 you can install this service from the Windows 95 CD, if you bought it with a new machine, or download it from the Free Software section of the Microsoft web site — choose "Product" then "Free download" and "Windows 95 Updates" from the main page. When it's installed, choosing the "Deliver now using Internet Mail" option will send your outgoing messages and retrieve any that are waiting on the internet provider's computer.

The redialling problem isn't strictly related to Eudora. When the program tries to collect your messages, it opens a connection to the mail server. With a dialup connection, your WINSOCK.DLL file will automatically try to dial the internet provider, before returning to Eudora and saying that the connection has been made (or couldn't be made). Until this happens, the Stop button won't do anything, since control has passed from Eudora to the network software that's opening the connection.

The real solution lies in configuring your TCP/IP software so that it doesn't redial as many times to establish a connection, which will enable it to return control to Eudora more swiftly so that the Cancel button is recognised.

Finally, checking how much email you have before connecting isn't something that's possible, although some programs will allow you to retrieve the headers of messages first and then decide which ones you want to transfer to your computer. One is NetScape Communicator, which you can download from home.netscape.com.

Trying to get through

Q. *"I have only one phone line. Is there any software that could inform me of a caller trying to ring me when I'm using the line for my internet connection?"*

A. No, there's not. The only way to know when someone is trying to call you is to use call waiting, but the tones that it produces

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disrupt modem calls and you'll almost certainly lose the connection.

An alternative is the CallMinder service from BT, which can take a message from callers when your line is busy and will tell you when you finish your internet connection that there are messages waiting, but the real solution to your problem is to have two phone lines. It may be worth checking with your local cable TV company to see if they are able to offer a cheap installation deal on an extra phone line.

Message received, but slowly

Q. *"When I send email to my friends over the internet, sometimes it's really fast, but at others it's very slow. We've looked at the Received: headers in the messages, and the messages don't even travel by the same route all the time. Why is this?"*

A. When you send email over the internet, messages aren't necessarily passed directly to the computer that the address is on. It might not be a real computer, or it could be on a network other than the net, or it might not be connected at the time you send your message, like a dial-up net connection.

To cover these eventualities, the internet's Domain Naming System (DNS) has a section called MX (Mail Exchanger) records. These say which computer on the internet receives mail on behalf of another computer, or a whole domain.

When you send email, the mail system looks up the MX record for the address that you're trying to reach and passes your message to the nominated computer. Most addresses on the Internet actually have more than one MX record, and each one has a preference. If the computer trying to send email can't reach the one with the highest preference, it will try the others instead. Computers are often set up so that when they have more than a certain amount of work to do already, they'll refuse connections for any more email messages.

It's a combination of these factors that results in your messages taking different routes each time they're sent. Often, an internet provider will arrange to have at least one MX record for his customers on systems that are elsewhere, so that if his network is cut off, mail can be held without being rejected until the problems are fixed.

Taking all this together, it means that your messages are most likely being delayed because of heavy traffic on one of the main MX systems for the recipient, resulting in them being routed to different computers, introducing extra hops and consequently slowing them down.

There's not really anything to worry about, unless they routinely take a long time. The way in which different systems are tried is part of what makes the internet resilient, ensuring that the failure of a single computer isn't going to stop messages getting through, although they may take a little longer sometimes.

Chat lines

Q. *"I've heard about the chat systems on the net. How do I access them, and how do I find out where there are people chatting about the topics that I'm interested in?"*

A. The main chat system on the internet is call Internet Relay Chat, or IRC. It's divided into channels, each of which usually has a descriptive name. You need an IRC client for your computer, such as mIRC for Windows and Ircle for the Macintosh, and then you have to tell the program which IRC server to connect to.

IRC servers receive the messages that you type and pass them on to other servers, where they're sent on to people who are using the same channel. Not all the IRC servers talk to each other, and there are a number of different IRC networks. The two largest are EFnet and IRCnet, of which the latter tends to have more people in Europe and the UK, while EFnet is predominantly American. Although there are some channels for UK discussions on both networks, #gb for instance, they're completely separate: someone needs to be on both the same network and the same channel to see what you're typing.

When your IRC program asks for the name of a server, the one you choose will determine which network you're connected to. In the UK, Demon Internet runs two public IRC servers: efnet.demon.co.uk is connected to EFnet and ircnet.demon.co.uk is connected to IRCnet.

The first thing to do when you're connected is probably to use the help command. All IRC commands begin with a / and most programs access some of the same ones. For instance, "/join #gb" will take you onto the #gb channel. "/quit" finishes your session, and "/msg name hello, how are you" would send the message "hello, how are you" to the IRC user called "name", rather than displaying it to all the other people on the same channel.

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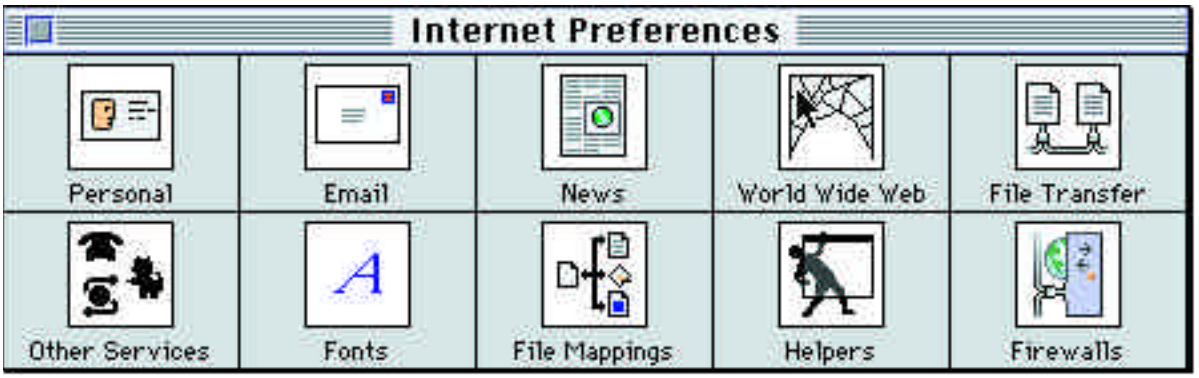


Internet Config is a simple way of setting common options for many Macintosh internet programs and utilities

POP goes the Demon

Q. *"I'm trying to choose an internet provider and I want to use the software that I already have, which collects email via POP. Friends have told me that I can't use that sort of software with Demon Internet, but I want to take advantage of their free web space.?"*

A. Don't worry too much about the web space. Although there are a couple of features unique to Demon's offering, if it's just size that's important to you, then there are a number of other providers that also give away five megabytes of space.

Your friends were correct in their comments about Demon's email service, which uses SMTP to deliver email instead of POP. That used to mean that if you wanted to use a POP email program to collect email from Demon, you'd need an extra piece of software to collect the SMTP mail first. That's no longer true, as Demon now gives everyone the choice of collecting their email via SMTP or POP3. If you want to use your existing mail software, just tell it to collect messages from pop3.demon.co.uk and send them via post.demon.co.uk. For your user name, you should use the name of your Demon node, and your usual password. Doing that will retrieve all the messages for all the users of your Demon account. If you just want to collect messages for a single person, you can tell your software to use their name, followed by a plus, and then your nodename when it connects to the POP server. For instance, to collect just the mail for net.answers@stonewall.demon.co.uk, I'd use the user name net.answers+stonewall. Full details of the new mail system are on Demon's web site.

Figuring out Internet Config

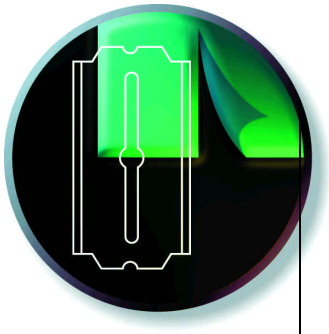
Q. *"I've downloaded Internet Explorer 3 for the Macintosh, and it offers me the option of installing "Internet Config." Should I install this, and what does it do?"*

A. Internet Config is an application that saves preferences for most internet tasks like email, news, ftp and web browsing. It's not strictly necessary, but if you use it then lots of different programs can pick up the information that they need from there. For instance, with Internet Config, if you change your email address, you only need to do it once and all the programs that are aware of it will automatically use the new one.

It can make things much easier to set up, but remember, you'll still have many options that can only be chosen in the appropriate applications, so it's not a universal cure-all.

PCW Contacts

Nigel Whitfield is a freelance journalist and maintainer of several internet mailing lists. You can send questions to **net.answers@pcw.vnu.co.uk**, but a personal reply to every query cannot be guaranteed.



Books

Read Press Send, the book, before it races on to the big screen. Plus, are crashes and bugs technology's way of telling us to resist becoming dependent on computers?

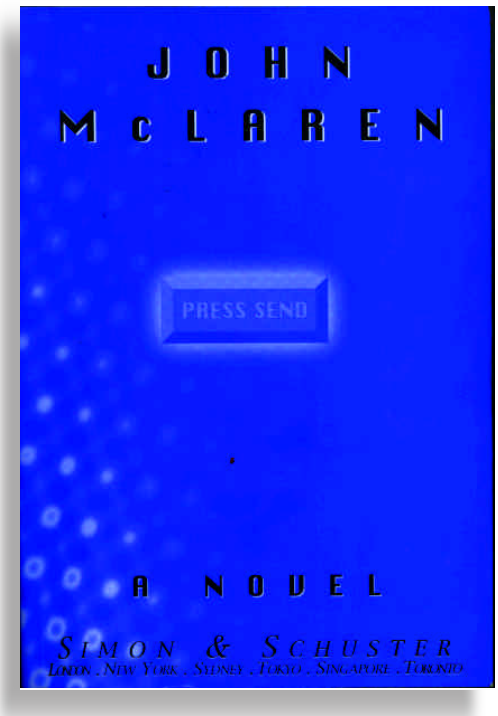
Press Send

Very few novelists manage to sell the film rights for their first novel. But John McClaren has sold his for $750,000 to Mike Nichols, director of, among others, *The Graduate* and *Postcards from the Edge*.

What makes McClaren more unusual is his background. He puts his mediocre degree down to bad advice from Tony Blair's father, Leo, his law professor at Durham University in the early seventies. After university McClaren worked as a diplomat for eight years before being recruited by Barings, which was looking for someone to run its Japanese office. After a spell in Tokyo he moved to Silicon Valley in the mid-eighties. For the last nine years he has been a successful merchant banker and director at Deutsche Morgan Grenfell in London.

Press Send is set in Silicon Valley in the world of hi-tech start-ups and venture capital. McClaren has used his knowledge of the industry to make the technical details of the story as convincing as possible. The hero, Hilton Kask, is turned down at the last minute by a venture capital company for the money needed to develop a revolutionary genetic computer. (The description of the genetic computer — the breakthrough in artificial intelligence that everyone is still waiting for — was based on a visit to the AI centre at Edinburgh University.)

Days later, Hilton discovers he has terminal cancer, but manages to plan his revenge from beyond the grave. He leaves a mobile phone for his brother Conrad with the instruction scrawled on a scrap of paper to "Press Send".



The book has a plot that Michael Crichton would be proud of. It manages to stay just the right side of believable and it zips along. But the characterisation is weak. A review in *The Bookseller* describes *Press Send* as Douglas Coupland meets Nick Hornby; but McClaren's writing lacks the wit or knack for cultural references of Coupland or Hornby. Most of the book is written in dialogue but it's thin stuff, and the main characters are a little too stereotyped to be convincing. Nevertheless, it's an easy read and in the right hands may eventually become a great movie.

Ben Tisdall

Why Things Bite Back: New Technology and the Revenge Effect

The Revenge Effects of author Edward Tenner are the unforeseen and unintended consequences of developing new technology. As computer users we are among the most vulnerable to such effects. We all hold our breath when we boot our machines. Will the hard drive crash today? How much more paper will our supposed paperless offices spew out? Worse, will we get RSI or suffer the effects of exposure to electromagnetism emanating from the monitor? These are just some of the alleged effects of computer technology that we all know about, and in this book Tenner makes a compelling case as to why advanced technology tends to create such problems.

It's not just computers: from sport to pest control, the more complex the technology, the more pronounced the effect, according to the Princeton University professor. It's not a new problem: Thomas Edison is quoted in 1878 venting his frustration at the little faults and difficulties he encountered as he developed his technology. It just seems to be getting worse. But as Tenner states: "Bugs, glitches, and crashes have a positive side. They are the machine's way of telling us to diversify our attention, not to put all our virtual eggs in one electronic basket."

The complex systems we now build seem to have the propensity for failure, in some cases with fatal consequences: jets

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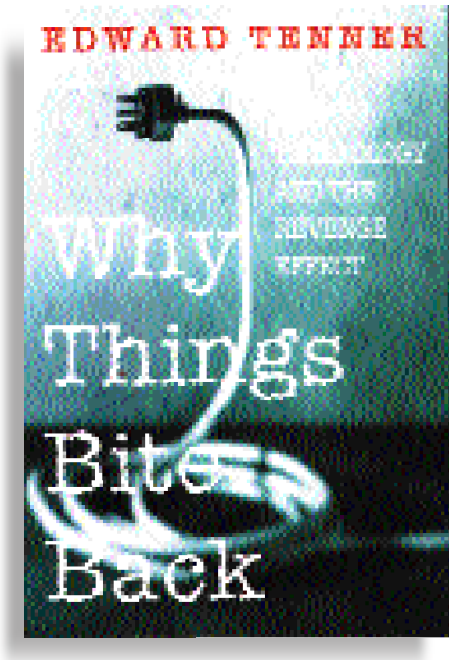
that fall out of the sky thanks to "failsafe" onboard computers being a stark example.

Tenner sees latent breakdown in all complex systems. Why has the universally applauded keyhole surgery resulted in increased re-admittance, due to related problems directly attributable to the initial procedure? Why did the M25 exceed its projected traffic loads for the year 2001, by the late eighties?

Tenner's advice is to become more vigilant. As new technology demands more concentration, it is almost inevitable that things will go wrong. Users of whatever the technology, be it a tennis racket (be careful of tennis elbow) or vacuum cleaner (watch



your asthma) must pay particular attention if they are to minimise their vulnerability. Ultimately, you may find that Tenner is too pessimistic by far, reading far too much into the paradoxes he sees. The paranoid and the neurotic are advised to give this book a wide berth.

Dave Howell

Top Ten Books/CD-ROMs

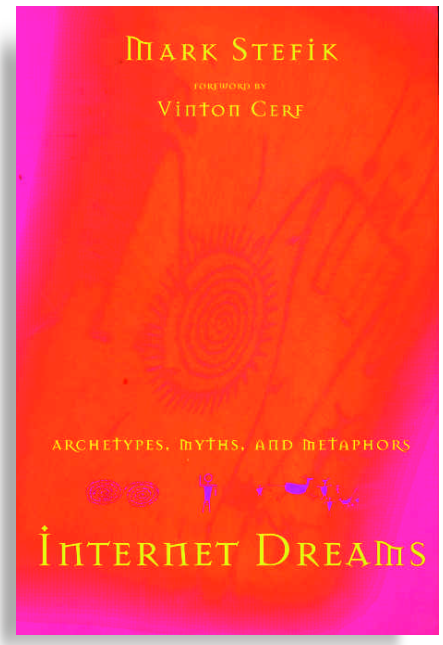
1	The Internet and World Wide Web: Rough Guide 2.0	Penguin	£5.00
2	Creating Killer Web Sites	Hayden	£41.50
3	Inside COM: Microsoft's Component Object Model	Microsoft Press	£32.99
4	MCSE Study Guide: Windows NT Server & Workstation 4	New Riders	£70.49
5	Microsoft Windows NT 4 Server Resource Kit	Microsoft Press	£140.99
6	Microsoft Windows 95 Resource Kit	Microsoft Press	£46.99
7	Programming Perl, 2nd Edition	O'Reilly	£29.50
8	Inside The Windows 95 Registry	O'Reilly	£24.95
9	Rapid Development: Taming Wild Software Schedules	Microsoft Press	£32.49
10	Java in a Nutshell: Desktop Quick Reference	O'Reilly	£14.95

List supplied by The PC BookShop, 11 & 21 Sicilian Avenue, London WC1A 2QH. Tel: 0171 831 0022. Fax: 0171 831 0443

Internet Dreams: Archetypes, Myths and Metaphors

Human society relies on myths and metaphors to make sense of the world around it. Any paradigm shift in the way society is organised, or communicates, will be understood by applying these archetypes to the new order. In *Internet Dreams*, Mark Stefik looks at how we are attempting to understand the information revolution, but notes that the metaphors we are using may be inappropriate and misleading. Using the highway metaphor, for instance, may be a misnomer, and completely inappropriate to the internet. As he points out: "Relying on a single metaphorical analogy would deprive us of a richer range of meaning and possibilities." The internet defies the use of one single metaphor to describe it.

Stefik concentrates on four metaphors that shape our current thinking: the digital library, electronic mail, the electronic marketplace, and digital worlds; these are all covered in depth, and he cites papers dating back 50 years in some cases to support them. He explodes what he calls the Gutenberg Myth, and applies this to the internet: as the invention of movable type didn't usher in a new age of literacy, so the internet alone will not bring about a renaissance in communication.



An interesting comparison does emerge, though. As paper for early books was expensive, not everyone could afford to own the books that would deliver literacy. Today, access to the internet is limited to those who can afford the hardware and operating costs.

For much of the book Stefik offers his views and comments on key academic papers he has identified. Each offers its own unique perspective on how we can understand and come to terms with the change we face. The last third of the book looks closely at how we can understand the net. Stefik concludes: "Our search for understanding of the I-way is ultimately a search for ourselves, and the future we choose to inhabit."

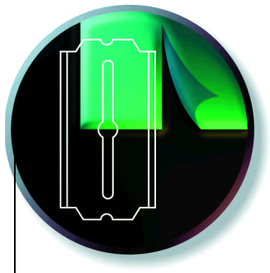
Dave Howell

PCW Contacts

Press Send
Author John McLaren
Publisher Simon & Schuster
ISBN 0-684-819198
Price £10.99
★★★

Why Things Bite Back: New Technology and the Revenge Effect
Author Edward Tenner
Publisher 4th Estate
ISBN 1-85702-560-1
Price £18.99
★★★

Internet Dreams: Archetypes, Myths, and Metaphors
Author Mark Stefik
Publisher The MIT Press
ISBN 0-262-19373-6
Price £19.50
★★★★



Cryptic clues

Quantum cryptography promises total security and privacy of data on the net, even guarding against would-be eavesdroppers. Toby Howard has had his ear to the ground.

With the explosion of commerce on the net, guaranteeing the privacy of data has become a crucial issue. Today, none of the encryption methods currently in use on the internet have been proved to be watertight. They are good, and certainly extremely hard to break (so don't worry, your credit card is quite safe) but they are not unbreakable.

A new technology promises security by offering codes which are impossible to crack no matter how much computing power and ingenuity is used against them. These are codes whose unbreakability stems not from clever mathematical techniques, but from the unbending laws of physics.

When it comes to security, the internet has more holes in it than a Swiss cheese. In a study conducted at the end of 1996, computer security researcher, Dan Farmer, found that of 2,200 web sites he surveyed, almost a third had security weaknesses, rendering them vulnerable to attack.

Farmer is the author of the controversial SATAN program, which probes Unix machines on the internet and checks them for known security lapses. Not everyone likes the idea of SATAN: although originally designed for systems administrators to find unwanted open doors on their machines, and rapidly close them, SATAN is also freely available for use by malicious hackers.

Not only web sites are at risk. Email is easy to intercept by "sniffer" programs which monitor the net data passing through a system, or by unauthorised access to unencrypted email in in-box files.

The codebreaker's nightmare? Quantum cryptography technology could be available by 2000, for secure data transmission on the net

Rumour has it that GCHQ (Government Communications Headquarters) regularly monitors email traffic in the UK, and that in the USA the giant supercomputers of the National Security Agency scan email for hints of terrorist or anti-government activity. Those in a position to say whether this is really going on are not telling.

Phil Zimmermann's Pretty Good Privacy (PGP) program is perhaps the best-known of the more secure coding systems available on the internet. PGP uses the RSA public-key system, which is also the basis for the secure transactions offered by Netscape Navigator and Microsoft Internet Explorer. Although public-key systems are extremely hard to break, they have not been mathematically proven to be unbreakable.

For some applications, this is not good enough. There is only one kind of code which is 100 percent secure, the so-called "one-time" system. The message is encrypted mathematically, using a numerical key (a long random non-repeating sequence of digits). Using the same key, the recipient of the message can decipher it. Because a different, randomly-selected key is used for every message, the encrypted message cannot contain any inadvertent clues to help a codebreaker crack it. It is the perfect code, used by spies for decades. But there is a catch: before the message can be transmitted, the sender and the recipient need to know the key. How can the key be transmitted? By using a secure code, which needs a key… Catch 22.

Spies have traditionally solved the key distribution problem using paper pads. Each numbered page lists a series of random digits, used as the key for a message. To send the secret message, Spy A chooses a page from his pad, encodes his message with the key, appends the page number, then sends his message to Spy B who looks up the key page in his copy of the pad and decodes the message. This is secure, providing the enemy does not get its hands on a copy of the pad.

For computer networks, the first demonstrable solution to the key distribution problem uses a technique called quantum cryptography. It provides a method not only to send data securely, but also to monitor whether anyone has been eavesdropping on the communications channel. With apologies to any physicists who may be reading this, it works something like this: Light comes in packets of energy called photons, each of which has a wobble called its polarisation. There are two kinds of polarisation: up/down and left/right.

You can build a machine to read a photon's polarisation but it must be configured to read either up/down or left/right polarisations. It cannot read both kinds at once. A machine set to read up/down photons will only give a meaningful result (up or down) if the photon it is reading is the up/down kind. If it is a left/right photon, the machine will give a random, and therefore meaningless, result.

Suppose Alice wishes to send a key, secretly, to Bob. First, Alice and Bob have to agree how to use the polarisations of photons to represent bits. Let us suppose they agree on "up" = 0, "down" = 1, "left" = 0, and "right" = 1. Alice creates a stream of photons, each with a polarisation chosen at random. She records the polarisation of each. The table above (Fig 1) shows the situation where Alice has prepared eight photons, labelled (a) to (h). She then sends the photons, in order, to Bob. When he receives each photon, he randomly configures his detector to read up/down or left/right photons. He notes the configuration, makes the reading and records the result.

In Fig 1, Bob happened to choose a left/right configuration for his detector to read photon (a), so he got a random result: in this case, a 1. For photon (b), he happened to choose left-right, which matched the type of photon and so correctly read the polarisation of the photon: a 1. For photon (c), the detector did not match the photon and so the reading was random: a zero.

When Bob has read all the photons, he tells Alice the configuration he used to read each of the photons. He can tell her this publicly, but he must keep the readings themselves secret. Alice then tells Bob which of those configurations matched the polarisations of the photons she sent him. In our example, these are (b), (d), (f) and (g). The values Bob obtained from each of the matching configurations, taken in order, spell out the secret key: 1001. All the other readings are discarded.

If, during the exchange of photons, Eve (an eavesdropper) listens in on Alice and Bob's communications, the laws of quantum mechanics dictate that her attempts to read the photons in transit will actually change their polarisations. So Bob will receive photons in a different state from those sent by Alice. Alice and Bob will notice this and will know they have been eavesdropped. They can try again. Once the key has been securely exchanged, Alice and Bob can send their message, encrypted using a one-time method.

This example shows the principle, but in practice it is more complex, for two reasons. First, Alice and Bob will need to establish a key, thousands of bits long; and second, according to the one-time principles, their key is only good for encoding one message. They must repeat the entire procedure for every message they wish to send.

This sounds like science fiction, but it has been demonstrated in experiments by Paul Townsend, a researcher at BT's laboratories in Ipswich. Richard Hughes, of the Los Alamos National Laboratory in California, has securely exchanged keys over a 14Km optical-fibre link. There are problems to do with noise, but the method works. Hughes predicts the technology will be commercially available by 2000. We reported in Cutting Edge (Sept 1996) that computers which work on quantum mechanical principles, if built, may cause the downfall of public-key cryptography. Perhaps quantum cryptography will take its place. The codebreakers will not like it. ■

Fig 1 Code configurations

	Alice's photons	Bob's detector configuration	Bob's measurement	Bits which make up key marked *
(a)	↑	←→	random	1
(b)	→	←→	→	1*
(c)	↓	←→	random	0
(d)	↑	↑↓	↑	0*
(e)	←	↑↓	random	1
(f)	↑	↑↓	↑	0*
(g)	→	←→	→	1*
(h)	→	↑↓	random	0

A toon in time...

Tim Frost on the growth and benefits of real-time animation techniques which will see off Saturday morning puppet TV presenters in favour of fully-animated, interactive characters.

If you have had all you can take of kids' TV programmes being co-presented by a bit of fur with a hand stuck up its rear-end uttering strangulated nasal noises, the future looks bleak. These fur monsters are going to give way to a mix of computer animation, motion capture and electronic puppetry to put fully-animated characters on-screen, that can react and talk with presenters.

The development comes from a mix of technologies used in various parts of the

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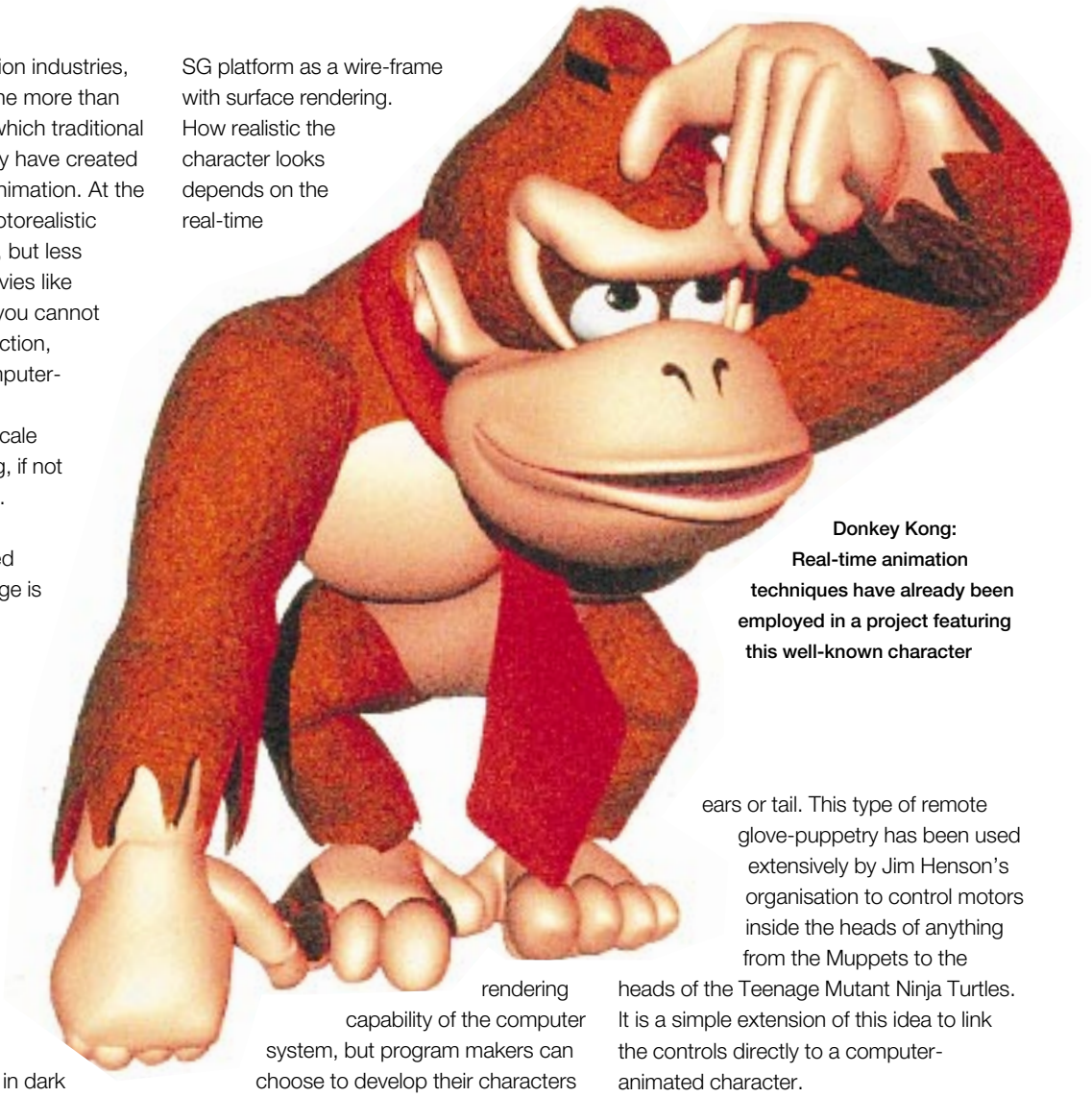
TV, film and games animation industries, where computers have done more than simply change the way in which traditional animation is produced: they have created completely new forms of animation. At the top of the scale are the photorealistic creations for *Jurassic Park*, but less obvious are big-effects movies like *Independence Day* where you cannot see the join between real action, filmed models and the computer-created elements.

At the other end of the scale there are realistically moving, if not realistic-looking, characters. Where animated cartoon characters move in a stylised way, the animator's challenge is to impart a sense of life by characterisation, but in the games and photo-realistic animation worlds, the challenge is to get the figures to move as realistically as possible. To do this, studios have turned to motion-capture techniques, using real people's movements to define the animation's movement and add that real action feel.

Originally, for motion capture, actors dressed up in dark body suits with reflective spots and lines which outlined the legs, arms, head and body. As they went through the moves, a video camera captured the movement of the reflective skeleton which was then fed into the computer as vector movements. The simplified skeletal motion was used as an action template for the character, resulting in realistic-looking action.

There have, of course, been changes to this technique over time. Instead of computer animators taking the moving frame as a template to manually create movement, the data can be fed into the computer to directly control the virtual character. And video has given way to the use of virtual reality body-suits to directly input movement into the computer. Put this together with Silicon Graphics boxes running commercial 3D animation software and we are looking at a version of VR control to create on-screen characters that can work live, with real actors.

The slowest part of the job is first designing and creating the character on the SG platform as a wire-frame with surface rendering. How realistic the character looks depends on the real-time rendering capability of the computer system, but program makers can choose to develop their characters as cartoony or as realistically as the computer's rendering power can deliver.



Donkey Kong: Real-time animation techniques have already been employed in a project featuring this well-known character

From there on, making animation is a real-time exercise with no frame-by-frame construction needed. Instead, the wire frame is directly controlled by the VR body-suit detectors that monitor the actor's individual key movements of arms, legs, head, hands and feet as well as their general body position. While the real presenters work on-screen looking to a blank space, the suitably-suited actor is working off-stage reacting to what is going on by watching their VR alter-egos on a monitor, electronically overlaid onto the studio picture.

So far so good. But a cartoon needs more than simple body movement to come to life; it needs facial expression and reactions that are not easily controlled by VR sensors. So in addition to the body actor there is at least one puppeteer with hand controllers that are set up to direct the movement of the mouth, eyes, eyebrows and any other distinguishing features like ears or tail. This type of remote glove-puppetry has been used extensively by Jim Henson's organisation to control motors inside the heads of anything from the Muppets to the heads of the Teenage Mutant Ninja Turtles. It is a simple extension of this idea to link the controls directly to a computer-animated character.

The most immediate application for the real-time animation is as a lower-cost route to creating a new animation series. The production speed is faster than any other form of animation. All the animation for a half-hour slot could be recorded in a good day's work with live-action animators. And the actions are editable: should a facial expression not quite work, the puppeteer can simply overwrite that particular set of face actions with new ones without altering, or having to re-perform, the body actions.

Developed originally in France, real-time animation has already been used on projects featuring both Bugs Bunny and Donkey Kong. Traditionally, the developers did all the work for the TV producers, but it has now developed to the point where a TV company can buy the hardware and software and a pre-made character or two, and then get on with it themselves in their own studio with their own actors. From there on it is a matter of adding artificial intelligence. That has got to be better than none at all. ■

Hands On Contents

■ *Hands On* is the place where readers can contribute to *PCW* and, as always, we'll pay for anything we use. Macros, sections of code, and hints and tips will be rewarded with a £20 book or record token (please say which you would prefer) and we will pay hard cash for longer, more involved pieces. Please include relevant screenshots in .GIF format.
All submissions should be emailed to the author of the appropriate section or snailmailed to Hands On, Personal Computer World Editorial, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on 0171 316 9313.
We are constantly working to improve the contents of Hands On. If you have any suggestions, send them to the Editor at the address above, or email them to pcw@vnu.co.uk

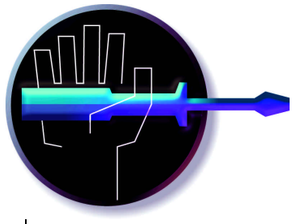
Workshop

Operating Systems

Applications

Programming

and the rest...



First class letters

With VB you can use Word to create letters that virtually write themselves. Tim Anderson shows you how. Plus, how to delegate in Visual Basic to achieve the benefits of inheritance.

The "*PCW* Sports Club" is continually sending letters, reminders of coming events, subscription invoices, sympathy for broken bones and the like. The secretary has been running the Visual Basic application to look up the address and then using **Alt-Tab** to switch back and forth from Word while she copies it across. It is time to make her life a bit easier.

The first thought was to use VB's **Clipboard** object to copy addresses. This is easy: just add a **CopyAddress** method to the **CPerson** class, as in Listing 1.

But Windows can do better than that. It is possible to automate far more of the process of getting addresses into Word. Word has a mail-merge wizard that works fine for bulk mailings, but for *ad hoc* letters a custom solution is needed.

Here, I will show you how to create a Word letter wizard for the sports club (see screenshots, Figs1-4). The wizard is for Word 97, since earlier versions do not support Visual Basic. (As an aside, it is possible to do something similar in earlier versions, using the WODBC.WLL Word add-in and getting at data through ODBC. Another possibility is to automate the WordBasic object from a VB application. But Word 97 makes it easier.)

The plan is to create a Word macro using Visual Basic for Applications, accessing the same SPORTS.MDB database.

Because this tutorial is based on VB 4.0, you cannot import the form in Word. The good news, though, is that the **CPerson** class module can be reused, as is. The procedure is as follows:

1. In Word, open the Visual Basic editor. Choose **Tools**, **References**, and check the Microsoft DAO 3.0 (or higher) object library.

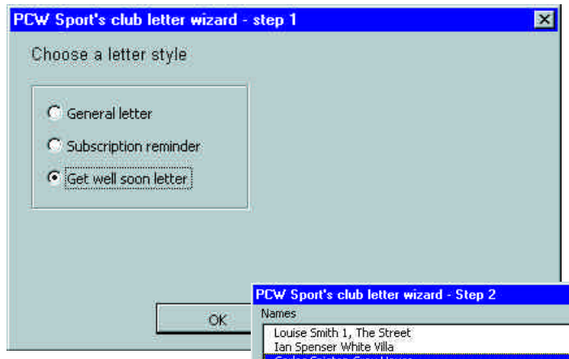
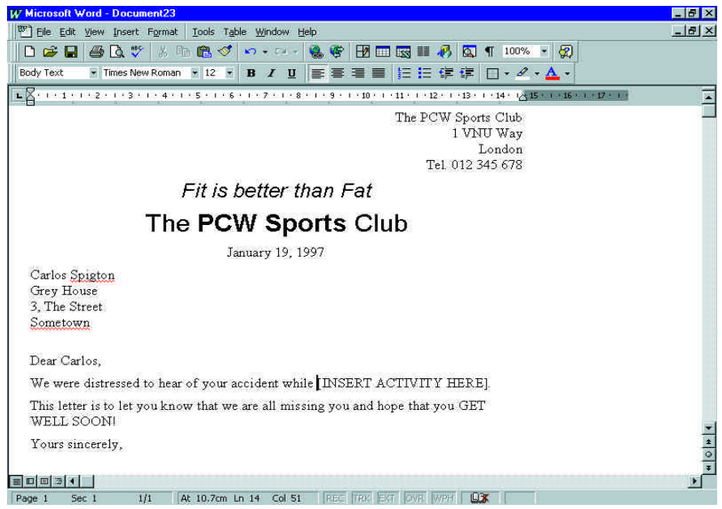


Fig 1 (left) The letter wizard begins by asking which template is needed. You can easily add further options

Fig 2 (right) The next stage is to choose a name to write to

Fig 3 (below) In the third step, the wizard has placed the address details into a new document based on the chosen template



Listing 1

```
Sub CopyAddress( )
' copies address to Windows clipboard
Dim sAddress As String
Dim cr As String * 2 ' fixed-length

cr = Chr$(13) & Chr$(10)

If mForename <> "" Then
sAddress = mForename & " " & mSurname & cr
Else
sAddress = mSurname & cr
End If

If mAddress1 <> "" Then
sAddress = sAddress & mAddress1 & cr
End If

...

Clipboard.SetText sAddress, vbCFText
End Sub
```

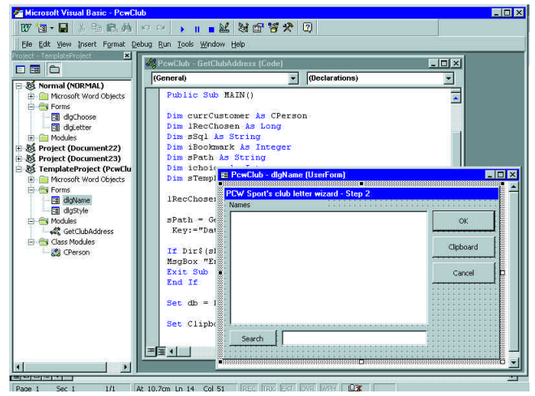


Fig 4 Editing the VBA macro from Word is very like working with standalone VB

This enables Word to use the same data access objects as VB 4.0.

2. Insert a new module into the Normal project. This means the macro will be stored in NORMAL.DOT. Call the macro **GetClubAddress** and give it a **Sub Main**.

3. Insert two new userforms. These will be steps one and two of the letter wizard.

4. Name the first userform **dlgStyle**, and put two or more option buttons on it, along with **OK** and **Cancel** buttons. Give the form a **Choice** property using a memory variable and property procedures. This is for choosing a letter template.

5. Name the second userform **dlgName**, and put on it a listbox, an editbox and three command buttons. This is for choosing a name for the letter.

6. In the Declarations section of **GetClubAddress**, declare a public database object. For the example code, I have also declared some convenient constants. Then in **Sub Main**, open the SPORTS.MDB database using code like:

```
Set db = DAO.OpenDatabase(sPath &
 "\SPORTS.MDB")
```

sPath is a variable to store the path to the database file. (See below for how to get this path from the system registry.) **Sub Main** also creates a new **CPerson** object.

The **Main** procedure continues by opening **dlgStyle** to obtain a choice of template, and then **dlgName** to get the ID of name in the **Members** database. At each point, the user has an option to cancel. The code for the **dlgName** dialog is almost the same as that used in the main VB 4.0 application, the main difference being that VBA has no data control so you have to create a recordset in code. When a member ID has been retrieved, the record is loaded into the **CPerson** object.

7. The final step is to start a new document based on the chosen template. The templates must be pre-designed with bookmarks where the name and address information is needed. The wizard finishes by inserting the fields in the bookmark positions and then exits. Controlling Word from VB in this way is not difficult using Word's new object model. For example: p258 ➢

Delegating your inheritance

■ A common criticism of Visual Basic is that it doesn't support inheritance. If all your programming has been done in Visual Basic, which is probably true of the majority of VB programmers, this may not mean much to you. Fortunately, it's easy to explain. A class, both in VB and other object-orientated languages, defines an object. In VB, every class starts from scratch without any properties or methods. By contrast, C++, as an example, lets you begin a class definition like this:

```
class monkey : public animal
```

The result is that the monkey class inherits the properties and methods of the animal class. The monkey class just needs to add specialised code that describes monkeys; the generic animal code comes for free.

Although VB does not support inheritance, there are other ways of achieving some of the benefits. It is possible to contain one class within another. Then you can implement properties and methods of the parent class by calling the properties and methods of the contained class. This is called delegation, and the properties and methods of a class are called its interface. For example, the tutorial application has a CPerson class. Imagine you wanted to create a CEmployee class which used the properties and methods of CPerson. Here is how you can do it:

1. Insert a new class module and set its name property to CEmployee.
2. In the declarations section, put:

```
Private m_person As CPerson
Private m_wage As Currency
```

3. In the initialise section put:

```
Set m_person = New CPerson
```

4. Create a CEmployee interface that calls the CPerson interface. For example:

```
Public Property Get surname( ) As
 String
surname = m_person.surname
End Property
```

5. Add new properties and methods specific to CEmployee. For instance, you must expose the wage property.

The fourth step (*above*) is tedious, but beats re-coding all the functionality of CEmployee in CPerson. It could be automated by a VB Wizard. In Visual Basic 5.0 this approach to object-orientation is built into the language, with a new Implements keyword which guarantees that all the methods of the contained class are implemented by the outer class. You can implement the interface of any ActiveX automation server. Finally, there is nothing to stop you implementing several interfaces in a single class.

Delegation works, but it is neither as intuitive nor as elegant as traditional inheritance. For the moment, though, this is the VB way. It ties in with ActiveX, the component model which is becoming more powerful and pervasive as Windows evolves. VB may not be the fastest or most thoroughly object-orientated language out there, but Microsoft does ensure that it stays up to date with the latest ActiveX developments.

```
Documents.Add (sTemplate) ' starts
a new document based on the given
template

ActiveDocument.Bookmarks("name").
Select ' sets cursor to the "name"
bookmark in the new document

Selection.InsertAfter Trim
(currCustomer.forename & " " _
& currCustomer.surname) ' inserts
text at the cursor position
```

Problem-solving

There are a few things to notice about this joint Visual Basic and Word project. Although Word VBA is downward compatible with VB 4.0, there are some objects which are available in VB but not VBA. One example is the global App object which, in Word, is the Application object.

The original **CPerson** class used **App.Path** to discover the location of SPORTS.MDB. This strategy fails in any case, when the code runs in other applications. A better idea is to use a registry entry, using VB's **GetSetting** command. The registry entry is created by the main VB 4.0 application when it first runs. This way, the data can easily be found by any Windows application.

Another catch is that VBA has no Clipboard object, so CPerson's CopyAddress method does not compile in Word. The workaround is to declare a public Clipboard variable as a **DataObject**: VBA's private version of the clipboard. To demonstrate, there is a Clipboard button on the **dlgNames** form which uses the DataObject's **PutInClipboard** method to transfer text to the read clipboard.

Enhancing the wizard

There are plenty of ways you can improve on the Letter Wizard. For instance, you can add database fields for things like job title and salutation. You could increase the range of templates on offer. For the subscription template, you could write code to check a person's outstanding balance and insert the amount into the letter. By adding the bulk of the code to a shared class module like CPerson, you can easily reuse it in VB 4.0 or in other VBA applications such as Excel.

Installing the example code from the *PCW* CD

When you unpack the tutorial code from our cover-mounted CD, you will find a VB 4.0 project and a Word 97 template. To install the example code, copy PCWCLUB.DOT into your Word templates directory. Then start a new document based on this template. If you then choose Tools, Macro, Visual Basic Editor, you will find the example macros. Choose Tools, Macro, Run, to run the macro. You can also copy the macros into NORMAL.DOT if you want, by using Tools, Templates and Add-ins, Organizer. Finally, the macro will not run without a registry setting for the data path. To create this setting, run PCWCLUB.EXE.

■ *Next month: Back to native Visual Basic for the final stage in the PCW Sports Club application.*

PCW Contact

Tim Anderson welcomes your comments and queries. Write to the usual *PCW* address, or email pcw@vnu.co.uk.

Cycling to work

Tim Nott explains the technique known as colour cycling, which you can use to “animate” your startup screen. And the History folder: web skeletons in your cupboard… revealed.

We’ve dealt before with changing the Windows start-up screen, but just to recap, the trick is to create a 256-colour .BMP file, 320 (w) x 400 pixels (h), and save it as “LOGO.SYS” in the root directory of the disk from which you boot (normally C:\). This doesn’t change anything permanently; if you delete it, the default screen, embedded somewhere in the innards of Windows, will return. But what has hitherto eluded us, is how to achieve the animation: those jolly blue flashing bars at the bottom of the screen that keep us amused while Windows is loading. Now, thanks to the efforts of Jason Ozin, who wins a book or record token for his pains, all can be told.

What you see isn’t, strictly speaking, animation. It’s a technique known as colour cycling. In a 256-colour bitmap, also known as an “indexed” image, each pixel is stored as a one-byte number that refers to a place in a palette of 256 colours. The palette, stored in the same file, is optimised for the image: a clouds-and-sky scene would have lots of shades of blue and white; an autumn-trees scene lots of shades of red and brown. This, incidentally, is why you sometimes see bizarre colour changes when viewing multiple images on a 256-colour display: the altered image is being displayed in the palette of another image.

Each colour in the palette is stored in three bits corresponding to 256 values each of red, blue and green. Colour cycling scrolls some or all of the values in the palette, so each pixel cycles through the range available. If the graduations are subtle, this gives the illusion of a flowing “plasma” effect, as seen in the Chromazone screensaver *(Hands On Win3.1, Sept 1996)*.

To create a cycling image you’ll need a bitmap editor. You can use something like Corel Photopaint or Adobe Photoshop if you want to be posh, but I used Paintshop Pro (Fig 2); there was a trial version on February’s CD-ROM. It has the advantage of being cheaper, easier to use and (a killer feature in this case) being able to import or export a palette as a plain text file.

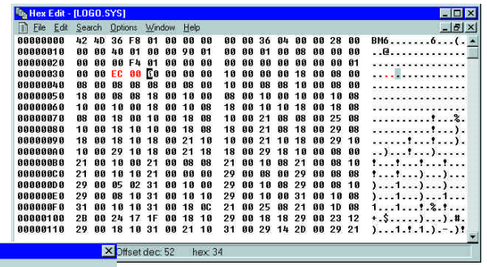


Fig 1 (above) **Enabling animation with a hex editor**

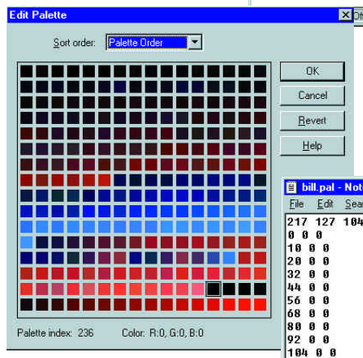


Fig 2 (left) **Editing the palette in Paintshop…**

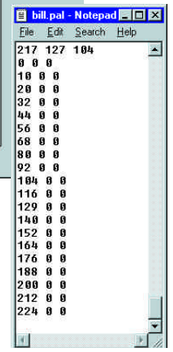


Fig 3 (below) **…but it’s easier to export it to Notepad**

You can use Windows Paint, but you won’t have much control over what’s animated as you won’t be able to edit the palette. You’ll need a hex editor and a sturdy anorak. For the former, I used Hexedit (Fig 1): it’s old but simple to use and there’s a copy on our CD-ROM in Hedit.ZIP.

Catch your bitmap (preferably in 16 million colours) and resize or crop it to 640 x 400. Although the final image will be half as wide, it’s actually stretched to this size when displayed, so you’ll be working in WYSIWYG mode. Do everything you want (like adding anti-aliased text that won’t show the “staircase” effect) while in this mode. Reduce the colours to 236. In Paintshop, you can do this by going to Colours/Decrease Colour Depth/X Colours. Select Nearest Colour and deselect Include Windows Colours. This will leave 20 spare colours for your animation.

If you then go to Colours/Edit Palette you should see that the last 20 colours are all black and have values of 0,0,0. Double-click on one of these and you’ll be able to edit it, either by dragging the sliders or entering red, green and blue values in the boxes. This is the tedious bit, as you must make sure that none of the new colours have already been used. There is an easier way: save the palette, from the Colours menu, and you’ll find you can load this file into Notepad (Fig 3); you’ll see a three-line header, followed by a line for each of the 256 colours in the form (for example, 256 0 0 is bright red). The last 20 should all be 0 0 0. I wanted some shades of red going to black, so I edited these to read 0 0 0, 10 0 0, 20 0 0 going up in steps to 228 0 0. Make sure none of the colours are already in the file. If it’s a photo this will be unlikely, but if so, skip around them with a slightly different value. Save the file and with the original image open in Paintshop, load the altered palette. Using only the 20 new colours, create the bits you want to animate (double-click on the foreground and background swatches to choose).

I wanted to create a shaded circle effect but you can’t use shaded fills in 256-colour mode. The workaround is to create a new file in 16 million colours, create the shaded fill using the same start and finish colours (by double-clicking the swatches and typing in the RGB values), then use the elliptical selection tool to copy and paste into the original file. When you’re happy with everything, resize the image to 320 x 400 (Image/Resize), making sure that Maintain Aspect Ratio is unticked. Save the file as a .BMP (Windows RGB encoded).

Copy the file to C:\ and rename it to LOGO.SYS. Load it into the hex editor and go to byte 00000032. Change the value to EC (the hex equivalent of 236) which will mark the start of the cycling part of the palette. Change the following byte to 00 or 01: the former cycles through the colours and jumps back to the beginning, the latter cycles up and back down again, smoothly.

Save, exit and restart the computer: your new animated start-up screen should greet you. To give you some idea of what can be done, I’ve included two I made earlier on our CD-ROM (in Logos.ZIP). Bill.sys uses the red shaded circle effect mentioned earlier, as well as some static text that changes colour. Psyched.sys is a slightly doctored screen grab from Chromazone; in this case the cycling starts at hex 85. Copy either to C:\ and rename it LOGO.SYS.

Loony Bin

Following the exposé of the Recycle Bin *(November 1996)*, Matthew Connor wrote to tell me that his Bin had recently developed strange properties:

1. “*Double-clicking the desktop icon reveals nothing: 0 objects, 0 bytes.*
2. “*DOS says there are 313 files in c:\recycled.*
3. “*Choosing File, Empty Recycle Bin elicits ‘Are you sure you want to delete these 1041 items?’*
4. “*With the Recycle Bin window open, a newly deleted item will appear in the Bin, but not after it’s closed and re-opened. The number of files in 2 and 3 above are both increased by 1.*”

The most likely causes are that one or both of two hidden files in c:\recycled has been damaged, or that someone has moved files to C:\recycled using File Manager or DOS. Although the Bin

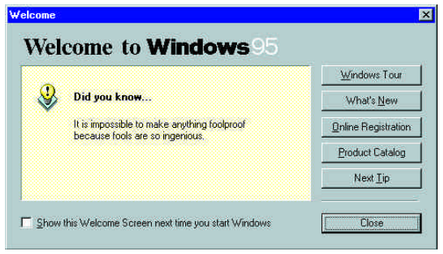


Fig 4 **Thank you, Peter McGarvey**

Sod’s law

It’s tip of the day time again. For those of you who haven’t been following the saga, the communal goal is to create a set of suitably amusing replacements for the Windows “Tips of the Day”.

Stephen Oman offered a generous selection including “Programming is an art form that fights back”. Dave Ives came up with three including the oldie-but-goodie: “It doesn’t matter who you vote for, the government always gets in”. But star of the month is Peter McGarvey, whose example graces our screenshot (Fig 4, above).

His covering letter was even better: “Once upon a time I wrote a program, in C, to display a short piece of amusement, at random, from a large text file of amusements every time my computer started. This program was written for MS-DOS, the greatest operating system in the universe. All my friends saw this program and asked for a copy.

“However, the next greatest operating system in the universe, Windows 3, soon appeared. I wrote a program, in C++, to display a short piece of amusement at random from a large text file of amusements every time Windows started. All my friends saw this program and asked for a copy.

“However, the next greatest operating system in the universe, Windows 95, soon appeared. Alas, the program written in C++ started to misbehave and all my friends started to complain. To placate them I hacked the Windows registry using a subset (180 out of 2,000+) of the large text file of amusements to rewrite the built-in ‘Microsoft Tips of the Day’.

“The next greatest operating system in the universe, Windows NT 4.0, has just appeared. However, all my friends, and Bill Gates, can sod off.”

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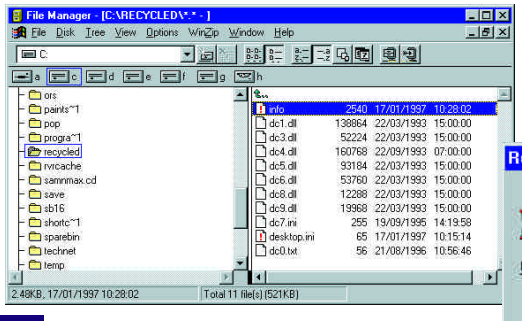


Fig 5 (left) What's in the bin? File Manager gives a drive-by-drive view

Fig 6 (below) Connect to a web site from the "Run" command

appears as a single entity, you get a Recycled folder on each hard drive or partition (Fig 5).

If you look at C;\recycled in File Manager (Run winfile.exe with View/All Files ticked and View/By File Type… everything ticked) you'll see a number of files named Dcn.* where "c" is the drive letter, "n" is a number and "*" the extension of the original file.

There should be two other files with the "hidden" flag set (i.e. an "h" in the right-hand column) named "Info" and "Desktop.ini". (There may also be Dcn.* files with the "h" attribute set, but this isn't important.) The Info file maps the Dcn numbers to the original file name. If it's damaged, nothing may show in the bin. Try deleting it. According to Microsoft it should be recreated when you start Windows, although this didn't work for me.

Alternatively, it may mean one or more of the recycled files themselves are damaged. If this is the case, Microsoft recommends you create a copy of the Recycled\Desktop.ini file in another folder, then delete the entire contents of the Recycled folder. Next, restore the Desktop.ini file to the Recycled folder and repeat the process for each drive or partition.

Note that doing this permanently deletes all files in the Recycle Bin.

Grovel

■ Stephan Freeman asks, re February's Hands On: "Does audio data really take up 10Mb/sec? So a one-minute long recording is 600Mb, and 72 minutes is 43.2Gb? Sorry, I had to point it out — I couldn't resist it." Thank you, Stephan. That should, of course, have been 10Mb/minute.

■ Concerning my comparison of Poledit with a well-known all-British motor vehicle, Jack Dobson complained: "Having just spent £9,000 on a new Reliant Robin, I am less than pleased at your sneering remarks. For me, it spoilt an otherwise good article." Sorry, Jack. I'll add the Reliant Robin to my list of politically incorrect subjects for humour.

History lesson

Those of you using Internet Explorer 3 will have noticed that Windows maintains a History folder, listing the URLs of recently-visited sites. This is in addition to the Temporary Internet Files folder that caches the web pages and graphics themselves. Like the Recycle Bin, Fonts and others, these are special folders: if you open them in File Manager, you'll again see a file called Desktop.ini. You'll notice, too, that things are not as they seem: under DOS or File Manager, the Temporary folder contains four sub-directories and the History folder contains, apart from Desktop.ini, just two files; MM256.DAT and MM2048.DAT. The former makes sense as it's more efficient to store and retrieve lots of small files in this way, rather than all in one directory. The latter makes sense as it saves disk space: if several hundred links were stored as individual files, each would take a "cluster" of hard disk space (on a 1Gb partition, that's 16Kb each).

Dig into the View/Options of Internet Explorer and you'll find you can empty both these folders. Or can you? Having cleared the History folder, you'll still find the two DAT files in File Manager. Load these into a text editor and you'll discover details of all the URLs and searches you thought you'd deleted. I'm not sure whether this is a gross breach of personal privacy or a heaven-sent tool for supervisors to crack down on unauthorised web browsing. But I think we should have been told.

Quick tips and clever tricks

■ Following January's tip for shutting down the computer without the confirmation dialog, Nick Mortimer and Tariq Atchia wanted to know if this shortcut could be modified to restart Windows. I have to confess that I haven't been able to find out, although it would seem likely. However, there is a quick way to log on as a different user. Press the Window key + L. If you haven't got a Windows 95 enhanced keyboard, then you can use the Key Remap utility in Kernel Toys (on February's CD-ROM) to make the right-hand Ctrl and Alt keys behave as if they were the Window and Menu keys. Thank you, Ed Scrase.

■ Martin Short wrote: "In Win3.1 programs running under Win95, the drive letter heads the directory tree in Save As… This can be frustrating if I want to save some work on the desktop. Is there a way to modernise these trees?" In a word, no. Windows 3.1 applications use the old, common Open/Save dialog which maps folders directly to the DOS directory structure. This can't cope with the peculiarities of Win95, such as having C:\Windows\Desktop as a container for other drives.

■ Kev Baldry asks: "When opening Explorer, drive C: is always shown expanded. If I wish to browse, say, my CD-ROM on D: I have to scroll up drive C's listing until I can contract it. Is there a way to display all the drives just as their icons and not expanded when starting Explorer?" Yes, there is. Open the Start Menu folder, find the Explorer shortcut and right-click on it. Select Properties, go to the Shortcut tab and change the Target to read

```
C:\WINDOWS\EXPLORER.EXE /n,/e,/
select,C:\
```

■ Steve Luby writes: "When 32-bit programs lock up in Win95, I usually press Ctrl-Alt-Del which brings up the Close Program dialog box. Instead of proceeding to press the End Task button to terminate the program, just wait three or four seconds and press Cancel. For some reason this seems to purge the affected memory area and in a couple of seconds you are returned to your application, complete with all the data input up to the moment of lockup. I have tried this with several applications (most often with Word 95) and it seems to work very well most of the time." Word 95 locking up, Steve? Surely not! I've yet to try this, but it sounds like it's worth a go.

■ A quickie, from Peter Smith — I thought we'd had this before, but it seems not: "I have just realised that with Internet Explorer installed you can connect to web sites via the Run command on the Start menu. This led me also to find that you can put internet shortcuts onto the start menu as well."

PCW Contact

Email **Tim Nott** at Win95@pcw.vnu.co.uk

The mousetrap

Yes, it's a good old-fashioned whodunnit: when your mouse trips up while treading the, er, mat, you can help it get its act together. Panicos Georghiades and Gabriel Jacobs direct.

With standardisation on Microsoft-compatible mice, mouse problems have lessened but haven't disappeared. Mice can still fail to function at all, be too fast, too slow, move in certain directions and not others, and work in some programs but not others.

Mouse matters come in threes. There are three types of mouse: Microsoft, Microsoft-compatible, and Microsoft non-compatible; three different ways of connecting them: via the bus, a PS/2-style socket, and a serial port; and they can be used in three types of application:

1. DOS applications, in which case they usually require a driver loaded in the config.sys or autoexec.bat files.
2. Windows applications, in which case the driver is provided by Windows, or a Windows driver is provided by the mouse manufacturer.
3. DOS applications running within Windows.

And, yes, there are three different causes of mouse problems:

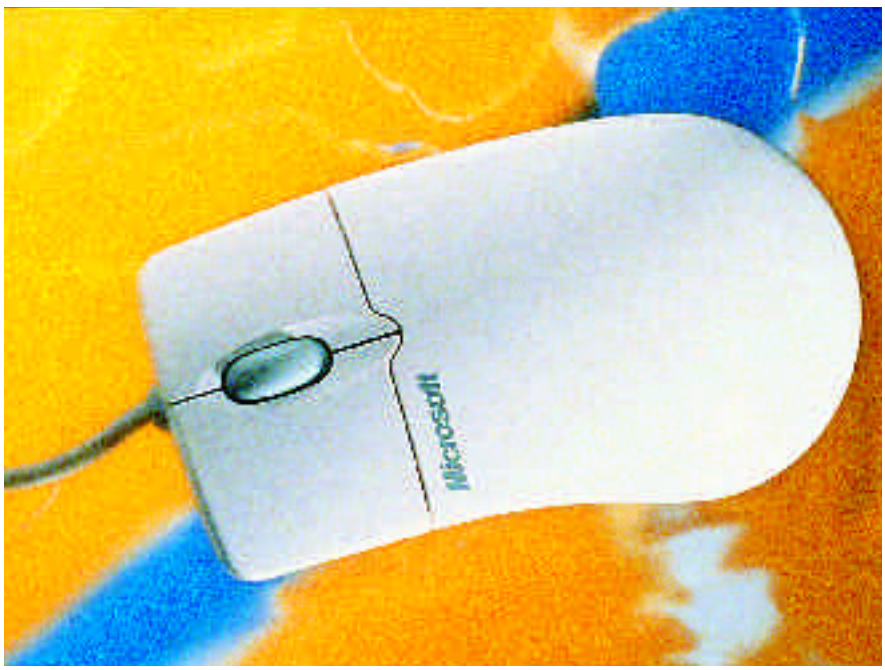
1. Hardware: the mouse isn't plugged in properly, it's a bad or unclean mouse, there's a bad mouse socket, a bad cable, a slippery or uneven mouse mat, or the mouse is connected to the wrong port or with a wrong or bad adaptor.
2. Bad drivers: an older or incompatible version is being used.
3. Conflicting software: your mouse driver may not agree with Windows, or a particular program, or with some other program running at the same time like a TSR program, anti-virus software, or screensaver.

A classic situation is using too many drivers. Manufacturers provide drivers for Windows and DOS (and sometimes for particular DOS programs) and nowadays for Windows 95. Don't install them all — Windows may not run properly if DOS mouse drivers are also there.

So, if you have a mouse behaving badly, first check for hardware causes — plug it into another computer, or plug another mouse into your computer. Next, establish that the mouse works in DOS and in Windows separately. If the mouse doesn't work in a DOS application under DOS, it will not work in that application if you run it under Windows. Install the DOS drivers needed in the autoexec.bat and/or config.sys files, as described in the mouse's documentation, and ensure that all works fine under DOS.

If you have a Microsoft mouse, use version 8.2 of the driver which comes with Windows 3.1 and, if necessary, expand mouse.sy_ and mouse.co_ (they're on the

p264 ➢



When problems strike, are you a man or a mouse? Take valuable advice on failsafe fix-its

Adjusting mouse settings

- Lowering the Sensitivity value in the Mouse section of Control Panel makes the mouse movements less jumpy.
- If the mouse is jumpy in Program Manager group windows, lower the granularity settings in the Desktop icon of Control Panel.
- If you're using the DOS-based mouse driver mouse.com or mouse.sys version 7.04 or later, add the /Y switch to the end of the mouse command line

```
(c:\windows\mouse.com /y)
```

- Note that erratic mouse movements may be specific to the application, video card, machine BIOS, keyboard BIOS, or machine type you're using.

Windows disks) to your hard disk as mouse.sys and mouse.com by using the EXPAND command at the DOS prompt. You can test whether all works well using a DOS program which supports mouse movements such as Edit. Then disable the DOS drivers by placing the word REM in front of the lines referring to them in the config.sys and autoexec.bat files, and check the mouse works under Windows.

The Windows mouse drivers are set using Windows Setup, and they appear in the system.ini file in the [Boot] section. Normally there should be a line like

```
mouse.drv=mouse.drv
```

To check you have installed the right Windows driver, exit Windows, change directory at the DOS prompt to c:\windows, and type SETUP. If you get a message saying no mouse has been detected, select the Microsoft or IBM PS/2 option.

Note that some so-called Microsoft-compatible mice are more compatible than others, and you might have to use some trial and error. In particular, try the drivers which come with the mouse installation disk rather than the Microsoft drivers. If all the above fails, try the following suggestions.

- Search the drive for multiple mouse.drv files. If you find any, rename them to something else, except for the one in the Windows System sub-directory.
- Test the mouse on a different port.
- Check that there's only one mouse.ini file, and that the line

```
MouseType =
```

in the [Mouse] section of the file points to the correct port.

- Try running Windows in standard mode. If all works well, try loading Windows by typing win /d:x. If all is still okay, add the following line to the [386Enh] section of system.ini:

```
EmmExclude=A000-EFFF
```

- Finally, if you're using a mouse that came with its own drivers, try to borrow a mouse that uses the driver supplied with Windows. If that works, contact the manufacturer of your own mouse.

Out of Africa

"I am doing voluntary work in Nigeria, and have been working on a stock-control and tracking program using DOS 6.22 and QBasic (the v4.5 compiler), but the compiled version of the program gives a totally incorrect output at the printer — the numbers are all wrong. Inspecting the code doesn't reveal much, as the only difference lies in an LPRINT statement (to printer) and a PRINT statement (to screen). There is no problem with interpreted printed reports or displayed reports. I've tried two different printers — no difference. I enclose some output samples. My big fear is a virus, as they are rampant here."

Leigh Bowden, Nigeria

The Microsoft Knowledge Base doesn't list your problem, but there are a number of possible causes.

We doubt a virus is the culprit — virus programmers tend not to target something as old as QBasic! We assume that you're not trying to print while running the program in a DOS session within Windows, as this doesn't work with all DOS programs.

The output samples you sent us show that the text prints fine; only the numbers are wrong. This obviously implies that the problem lies in calculations or statements to do with numeric data only — perhaps a different set of calculations is being used to output to the screen than to the printer. Programmers sometimes attach calculation statements to PRINT statements, and since QBasic needs two different statements, one for the screen and one for the printer, the set for the printer may contain errors.

Alternatively, it may be that certain formatting commands used for the printed output don't work properly when compiled. In any case, check you're using the right version of the compiler for the version of QBasic you have, and that you're setting the right options for handling numbers for the compilation. Also, have you checked the compiler documentation for supported statements and commands? Some statements are supported by the interpreter but not by the compiler.

The write font

A frustrated Bill Reid (mailto:reidw@nacn.dnet.co.uk) mailed us about being unable to change the default font in Windows Write. Each time you start Write, the default font is Arial: he wants it to be Times New Roman.

Trying to answer this query has prompted us to write about a method of creating templates for Windows Write, to use for letters, memos, and faxes, a feature available on all mainstream word processors but missing from Windows Write.

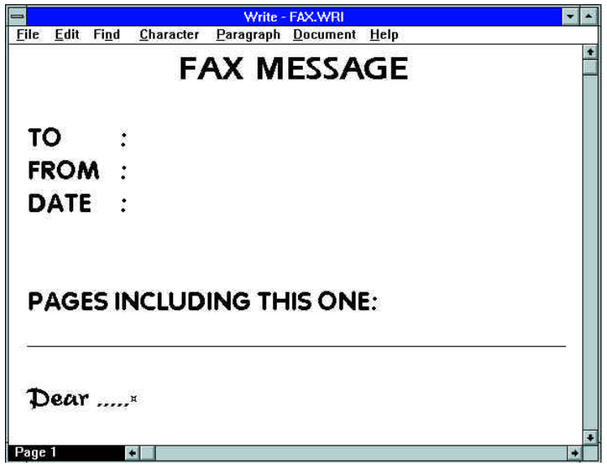
You can create your own designs and save them as standard Write documents. Give them names like letter.wri, memo.wri and fax.wri. To prevent overwriting the templates, you have to Save As, not Save, and to avoid using Save by mistake, make your template files Read Only by changing their Attributes in the Properties option of the File menu in File Manager.

To use the templates you open Write, then use File Open to select a template, or you can assign icons to each template so you can open them with a double click. To do this, start Write and the template in one go by editing Write's Properties in the File menu of Program Manager. In the command line of the Properties dialog box add the filename of your template, so the command line reads, for example, write.exe letter.wri.

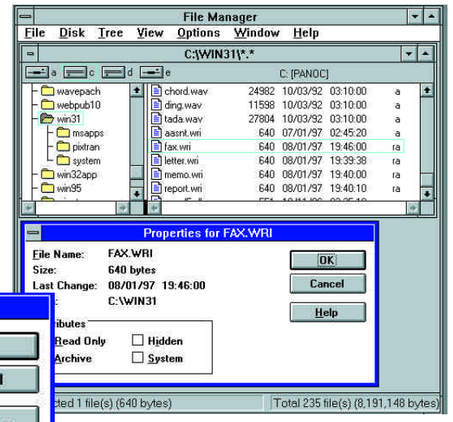
Do this for all your templates by clicking and dragging the Write icon while pressing the CTRL key to make copies of it, then editing each one's command line to include a different template filename. Change the default Write icon to another one by using icons embedded in Progman.exe.

To change the default font from Arial to something else, create an "empty" template. The only problem is that the template can't be completely empty, so you need to type a space, say, then select that space with the mouse, and from the Fonts menu change the font to the one you want.

A step-by-step guide to creating Write templates

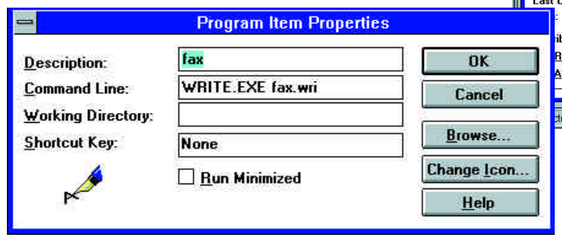


Above Create your templates in Write and save them as any ordinary Write documents



Right From File Manager make the template files Read only

Below Create multiple copies of the Write icon and edit each one to include the template file name in the command line



Right You will end up with multiple Write icons, each one starting a different template

Below To customise your templates even more, choose a different icon for each one using the icons embedded in Progman.exe, or any other icons you may have

PCW Contacts

If you have any queries or Win3.1-related topics to discuss, contact **Panicos Georghiades** and **Gabriel Jacobs** at Win3@pcw.vnu.co.uk.

The main event

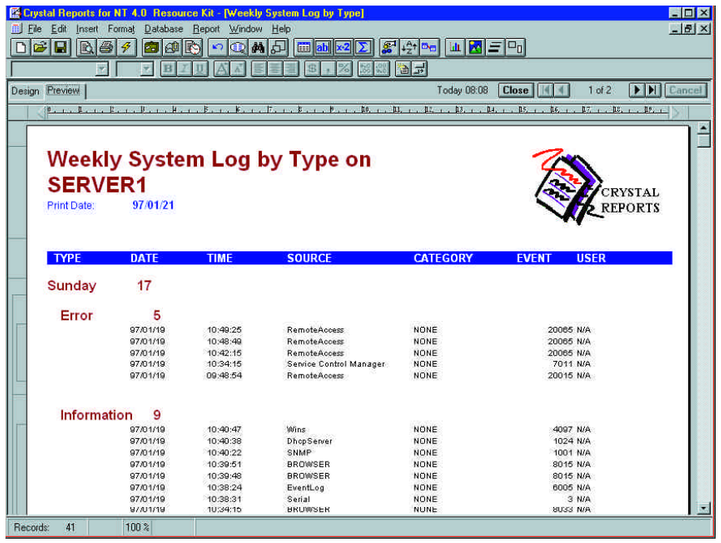
The Windows NT event logs keep track of what's happening in the system, but they themselves need regular attention. Dale Strickland-Clark shows you how they work.

When you want to know what's been happening on your system, the NT event log is the place to turn. It's the central record for notable incidents and can help with problem diagnosis, resource management and capacity planning.

Each NT workstation or server has three event logs: system, security and application. The system log contains information about configuration problems, the state of the services and the use of printers. Application programmers determine what they consider important enough for the application log and administrators control most of what is written to the security log.

These logs are a valuable source of information concerning what has happened on a system and it's a good idea to archive them daily if you're ever likely to want to examine the historical behaviour of a system.

Records are written to the event log in a format which, in part, is only understood by the application that wrote them. When you view or export the logs, the system calls upon each application to format its own records so you can make sense of them. This is great until you take a raw event log (an .EVT file) and attempt to examine it on another system. If the application that created the records isn't installed, you may find that much information won't make sense. Depending on the network, you may also find that user IDs are displayed in their internal representation, which is a curious string of digits called a SID. There is a similar danger when attempting to examine an old archived log. If applications have been removed from the system or users deleted, some log entries may reveal less than you'd like.



The Crystal Reports bundled in the Server Resource Kit provides exception reporting and basic analysis of event logs

For these reasons, it's a good idea to consider the information you're likely to want to extract from event logs before choosing your storage strategy. It's also worth watching the size of the event logs you generate. Large logs of tens or even hundreds of megabytes per day on a busy system are easily achievable if you're over-zealous with auditing.

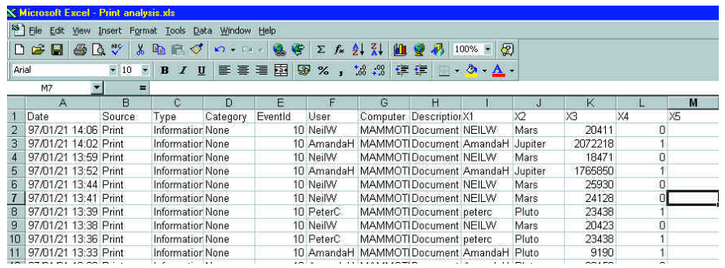
Because of the possibility of event logs becoming useless over time or losing touch with the applications creating them, long-term storage and most types of analysis are going to depend on a formatted export of the event log. I think there are three main types of uses to which the event log is put. The first is as a problem alert, although it's not really designed for this: serious problems are already written to the console and sent as messages to registered administrators. Second is as a problem diagnosis aid for when something isn't working properly and you need to find the reason. Lastly, as an audit trail, to record who's done what.

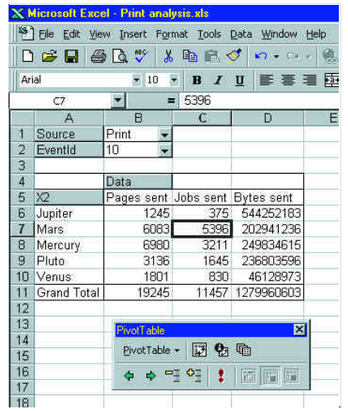
As part of a capacity planning exercise, I needed to find out which printers on a network were being most heavily used and by whom. The Event Viewer application that comes with NT is adequate for viewing raw events but pretty hopeless for analysis. While it will export the logs in a comma-delimited format, you can't automate the process and the resultant file might be described as offering an interesting challenge for analysis.

There is a tool in the NT 4 Resource Kit called DUMPEL that might have helped simplify getting the data out of the logs, but in spite of the help file suggesting otherwise, I couldn't get a comma-delimited file out of it. I'll look at this again when I come to automate the archiving of log records, but for now I was happy to get the data out by hand, using Event Viewer.

The Server version of the Resource Kit includes a copy of Crystal Reports that will read the event logs directly and produce a

Once the event log data has been massaged into a tidy comma-delimited format, Excel will quickly turn it into a simple database

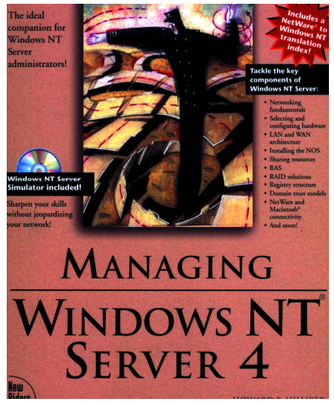




Excel's PivotTable is an ideal tool for interactive analysis. Here it summarises the use of several printers

Books

■ **Managing Windows NT Server 4**
Author: Howard F. Hilliker
Publisher: New Riders
Price: £46.99 (incl VAT)
This book bears a striking resemblance to *Inside Windows NT Server 4* (reviewed January 1997) by the same publisher. Many of the subjects covered are similar, and I'm also suspicious of the number "4" in the title. Parts of the text have a distinct NT 3.51 ring to them and there are even screenshots from an NT 3.51 system. Worse, the console command reference at the back of the book mentions none of the extensions introduced in NT 4. Either this is a revised 3.51 book, or it's been a long time in the making. Gripes apart, this is a solid, thorough volume covering most of the issues concerning NT administrators. The CD is a corker, with a vast amount of demonstration NT software plus a free copy of *Inside Windows NT Server* in Acrobat format.



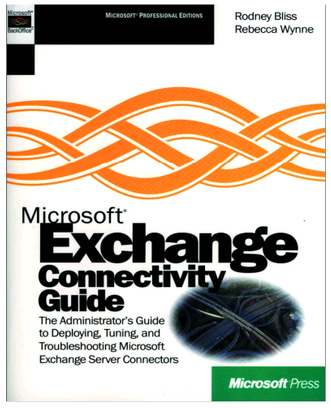
■ **Whiz Bang Web Site F/X**
Author: Tom Lockwood
Publisher: Que
Price: £32.99 (incl VAT)
This book solves one of the great mysteries of the web age: how do you make a background that tiles seamlessly? Also explained is using image maps, creating animated GIFs, working with audio, Java and multimedia. CGI scripts and VRML are explored along the way on the journey to producing appealing web sites.

The book adopts the unconventional approach of listing very few of the code samples on its pages, leaving you, instead, to fish them off the CD — which is nicely organised as a web site with links to relevant pages out in the real world.

The author knows his subject well and explains it clearly. This is an ideal companion for someone already familiar with HTML but who wants to be more adventurous.

■ **Microsoft Exchange Connectivity Guide**
Authors: Rodney Bliss, Rebecca Wynne
Publisher: Microsoft Press
Price: £27.49 (incl VAT)
The connection possibilities offered by Exchange are many and even the experienced administrator can find themselves with a system that really should be transmitting mail but stubbornly refuses. This book explains the large number of parameters that affect message transfer and fills the very large holes left by the documentation supplied with the software. It assumes little and explains setting up a server to talk to the internet, X400 or MS Mail in networks of varying complexity.
All the dialog boxes concerned are shown and each parameter is explained along with possible problems you may encounter and what to do about them.

A very comprehensive and useful reference.



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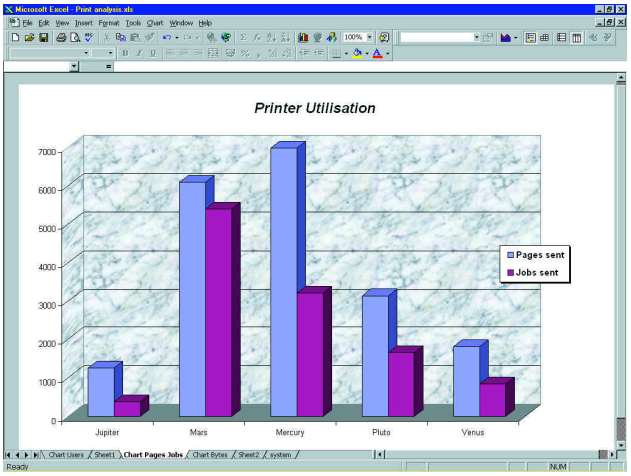
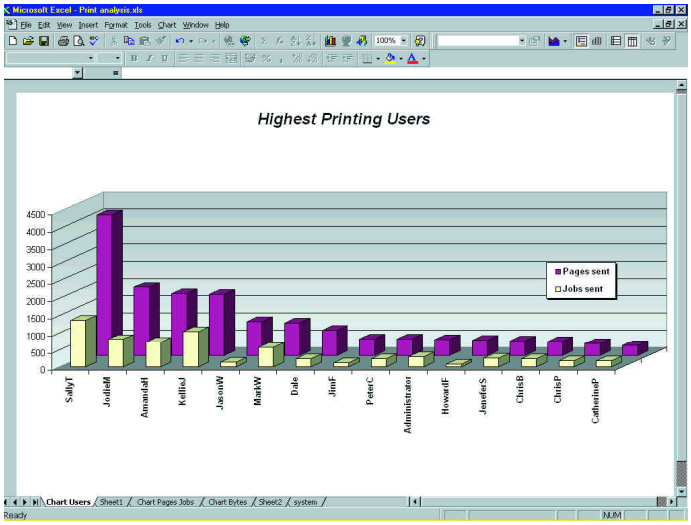


Left The poor distribution of workload is now evident. Mercury, an overworked LaserJet 5P, might benefit from swapping places with Venus, a rather swift Lexmark Optra Rt+
Below Highlighting high print users might encourage economic printing behaviour. Sadly, it's turned into an ugly scramble for the top position



variety of reports, but in the end I chose Excel to do the analysis backed by a little Perl program to sanitise the data.

I exported the system log from the server into what the Event Viewer program calls a comma-delimited format and ran it through the Perl program, cleanevent.perl *(see screenshots, page 266)*. Cleanevent adds a header record, identifying the columns so Excel will treat the data as a database. It merges the date and time fields from the log, it picks up all the trailing description fields that sometimes follow a record and adds them to the end of the original record, and, finally, it identifies the records relating to printing. From these it picks out the user ID, printer name and print size, placing them in the general-purpose fields, X1 to X4, on the end of the record. If the output of cleanevent is written to a .csv file and dropped into Excel, it will automatically be split into individual cells and is immediately ready for analysis.

I called upon a PivotTable (under the Data menu) to do the analysis and finished off with a few charts to help illustrate the load on the printers.

The Perl routine could easily be extended to extract other interesting information, split the logs into smaller record sets or write it to a database for long-term analysis.

Mouse moment

If you cast your mind back to the January issue, you may recall my request that Santa deliver a new design of pointing device. Well, it wasn't Santa but Microsoft that came up with the goods, and while it's not exactly what I asked for, we're definitely heading in the right direction. I refer, of course, to Microsoft's new Intellimouse. I've only been using it a month or so and already I'm lost at a PC without one. Now, with an ordinary mouse, I find myself scraping uselessly at the little gap between the two buttons and receiving strange looks from uninitiated onlookers. Scrolling has never been so effortless. Nine out of ten points, Microsoft. I'll save the extra one for when someone comes up with a cordless version. (Are you listening, Logitech?)

PCW Contacts

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Computer Manuals **0121 706 6000**

The common good

... and bad, unfortunately. But Chris Bidmead is in combative mood as he attempts to install the Common Desktop Environment on his network, and defends a remark he made earlier.

A couple of months ago I mentioned that CDE, the Common Desktop Environment, is now available for Linux, and I showed you a screenshot of it running on LinuxPro, the version of RedHat Linux supplied by WGS (Workgroup Solutions) whose web page (unsurprisingly) is www.wgs.com.

I'd borrowed the screenshot from the WGS web site. But this is supposed to be the Hands On section, so I made a vow to myself that I'd follow through by getting hold of the software and installing it on my network. There's some bad news about this, some good news, some more bad news, but ultimately, I'm glad to say, some good news.

Before we get into that, I'd like to deal with some heated email from a reader who objected to my remark in the column that the CDE screenshot made LinuxPro look "uncannily like the AIX desktop — which of course is the point of CDE". When the major UNIX manufacturers got together in 1993 around an initiative called COSE (the Common Open Software Environment), of which CDE was to be the first component, the intention was to simplify things for system administrators and users by offering a "look and feel" that would be similar across all the UNIX platforms. One of the first manufacturers to implement this was IBM on AIX, and as I happen to run AIX here, it seemed worth mentioning the resemblance.

Andrew Lehane seemed to think I was suggesting IBM had invented CDE singlehandedly. If my very brief mention in the screenshot caption gave that impression, I'm sorry. Long-term readers of this column may remember that back in January 1994, speaking of IBM's introduction of the LaunchPad on OS/2, I said: "And the first of the promised COSE interface features also arrives with version 2.2 — a dashboard control based on Hewlett-Packard's VUE (Visual User Environment), a point-and-click program launcher and screen manager."

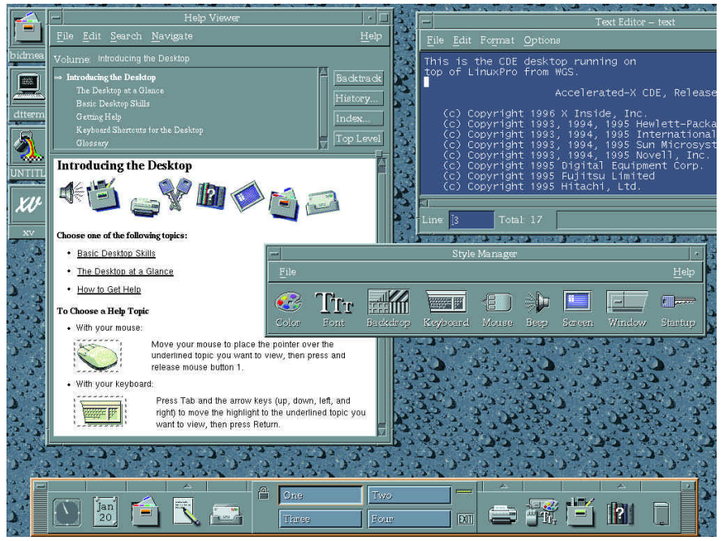


Fig 1 This is the Common Desktop Environment. It happens to be running on top of LinuxPro, but in theory it could be any UNIX and you wouldn't know the difference. It's not just a pretty face — there are internal subtleties like drag-and-drop which I'll investigate in later columns

Yes, the panel at the bottom of Fig 1 derives heavily from VUE, but Andrew's complaint ("Why make these statements when, as I am sure you realise, CDE is in fact a decedent of HP's VUE Windowing System, an enhancement to OSF/Motif developed in post-Apollo days and released prior to 1991 for HP-UX 8.0?") seems to suggest that this is the whole story. In fact, all the COSE members pooled their technologies to create CDE, as you can see from the copyright notice in the picture. As COSE was an initiative rather than an organisation in its own right — or as Sun's CEO, Scott McNealy, famously put it, "COSE is a verb and not a noun" — the product needed to be nurtured through the existing alliance of UNIX manufacturers, the Open Software Foundation (OSF) which has since been rolled into The Open Group. Andrew's loyalty to Hewlett-Packard (it turns out that he's working in its Telecom Systems Division) is commendable, and I'm delighted that he reads and likes the column, but I hope I've managed to deflect his accusation of "inaccuracy".

Good and bad

Now for that good news/bad news stuff. As soon as I discovered there was a Linux version of CDE, I dropped an email to Mark Bolzern, the Linux guru who runs WGS. The first lot of bad news was that he was very nervous about sending me review software because, as it turns out, it costs him an arm and a leg in royalty payments each time he ships the product. I find it ironic that someone whose core business is distributing royalty-free software should be held to ransom by the so-called Open Software Foundation, which charges him $100 for the CDE and Motif components in each CDE shipment.

It's a tribute to Mark that he managed to get a package out to me, comprising the six-CD set that makes up LinuxPro, along with the CD and manuals for CDE. This was the good news. The implementation of CDE he uses comes from an outfit called Accelerated X, mainly known for its souped-up commercial version of the X server for UNIX on PCs. Its CDE requires the Acclerated X server, which is what Mark ships with his LinuxPro.

I installed LinuxPro and was all ready to go on to the CDE when the shattering news came through about Apple's acquisition of NeXT. I dropped everything and spent the next week or so on the internet, news gathering and chatting with gurus by email for some articles I was writing. After the dust had settled and it became clear that Gilbert Amelio may turn out to be the best thing that ever happened to Apple and NeXT (although it's a rocky road ahead) I finally caught my breath and went back to the relative tranquillity of LinuxPro and CDE. Or rather, just LinuxPro. Because — the next bit of bad news — I simply couldn't get my system to read the CDE CD.

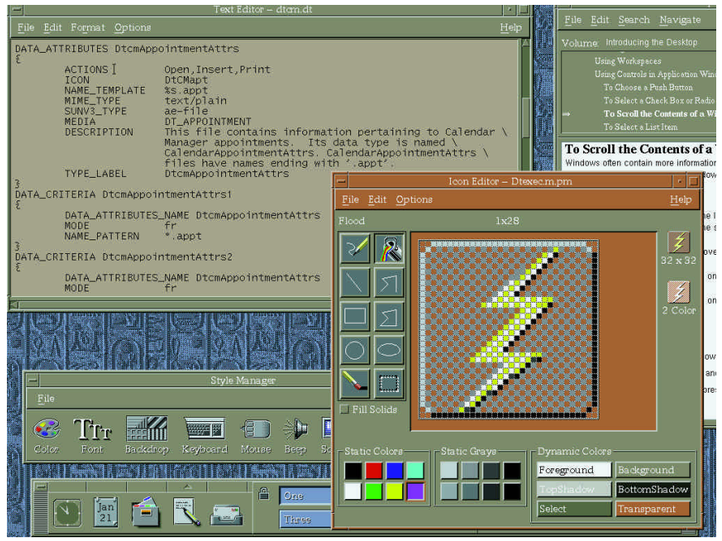
I'd installed LinuxPro on the old Apricot Xen LS-II. You may remember the trouble I had with SCO OpenServer not being able to recognise the Xen's Sony CDU31a CD-ROM drive because it uses a proprietary non-SCSI, non-IDE interface. There's no problem with Linux though — a driver for the CDU31a is part of the standard distribution. One of the Linux system developers, Mark Evans, has even written a driver for the rather obscure on-board busmastering ethernet port on the Xen.

The Apricot Xen LS-II had read the LinuxPro installation CDs perfectly, and as far as I can remember had never shown any sign of trouble with other CDs before. But with this particular CD it was spinning its wheels, just at a time when I was desperate to install CDE and get a screenshot to you. Attempting to mount the CDE disk produced the error message (after a long hang) "can't read superblock". Even before I tried mounting the drive, its flickering LED indicated that it was labouring during the spin-up following inserting the CD. Oddly, the NeXT machine and the AIX PowerPC had no difficulty reading the CDE CD. It was just this combination of the Apricot drive and the CDE CD that was coming unstuck. After some experimentation — and I'm not going to tell you how many hours I spent messing around with this — I was forced to the conclusion that some drives, particularly older drives, just don't like some CDs.

This was distinctly bad news, and I found myself wondering how long it would be before I could free up another machine, reinstall LinuxPro on it, and then proceed with CDE. I was about to pack away the Apricot and sit down to write my excuses to you when I suddenly realised that this was the old, narrow, standalone-PC mentality that I'd supposedly escaped from three years ago when I started this column. The AIX machine, which had no trouble reading the CDE CD, is networked to the Apricot. Thanks to NFS, the Network File System that comes with every UNIX under the sun (or Sun, I should perhaps say), it's a trivial matter to hook up the AIX CD-ROM drive straight into the Apricot and treat it as though it were a local drive. NFS is a client-server connection. Here, the AIX box is the server and needs to expressly "export" the drive in question. How you do this varies somewhat depending on the version of NFS. Under AIX, I used Smit, IBM's System Management Interface Tool, to mount the CDE CD in the drive and then export the drive — or rather, the directory I'd mounted it on — over the network. The directory doesn't actually go anywhere at this stage; it just gets added to a list of directories that the NFS daemon advertises as being available for network connection.

On the Apricot I then needed to mount the exported directory onto a local, empty directory. I created a /mnt/NFS directory and mounted the AIX CD-ROM there. If you read the manual pages for mount (you need to do this with the command "man 8 mount", 8 being the manual chapter that deals with system admin) you may come away reeling from the surfeit of options available. But the Linux mount command is pretty smart these days: if you just ask it to mount aixbox:/mnt/cdrom /mnt/NFS (mount this alien filesystem on this local directory), it should be able to figure out for itself that you're talking about an NFS mount and that it needs to be read-only because you're dealing with a CD-ROM.

Having done this, I had the full contents of my CDE CD available from the Apricot's



The CDE desktop reconfigured with a different background and colour scheme. Here you can see the icon editor together with a sample of the code CDE used to tie icons to executables and ascribe particular behaviours to them

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/mnt/NFS drive. I switched to this directory, ran the dtinstall script I found there, and CDE loaded itself on top of my LinuxPro, with the handsome results you see in Fig 1.

Networking, modules and more

LinuxPro is based on the RedHat distribution, with some refinements added by WGS. Traditionally, Linux installation kernels come loaded with drivers for a huge number of devices and rely on autoprobing software to find out which ones to activate. This can leave you with an overlarge kernel, which is sometimes a tight fit where memory is limited. Once the installation is finished, you're normally recommended to recompile a slimmed-down version of the kernel tailored to your specific machine. For beginners, I should point out that this turns out to be a lot simpler than it sounds.

My Apricot Xen LS-II has 16Mb of RAM, which is plenty of room for Linux. Nevertheless, I prefer to start with the smallest possible kernel and add features as and when I need them. In the early days of Linux you couldn't do this, but newer Linuxes let you load "modules" which can be drivers for physical devices, file systems, or translation code like the iBCS module that lets you run applications written for other versions of UNIX. Mark Evans has modularised the driver for the Apricot Xen's on-board i82596 ethernet controller, so I installed a kernel that had no networking enabled, made sure this was working, and added the networking later. If you haven't yet installed Linux I should point out that most Linux distribution CDs come with a large variety of pre-compiled kernels in the form of disk images. You choose the appropriate image, transfer it to a floppy (where it appears as a bootable kernel and a bunch of vital support files) and use that as the initial boot disk. During the installation process you get the opportunity to install that same boot kernel onto your hard drive.

Typically, the installation process will mollycoddle you through procedures like setting up the network. The upside of this is that you get a working system with the minimum of effort. The downside is that you don't get to understand the fundamentals. Because I was starting without a network driver, the rest of the networking naturally refused to configure itself. Doing this manually was instructive and, luckily, not too arduous.

I found myself telling reader Michael Butler <m.butler@ic.ac.uk> about this at some length, and what follows below is a condensed version of that correspondence. Michael had written to me about the trouble he was having with his network card, and he'd opened his mailing with: "I have been converted to Linux through reading your column in PCW. It's a great column and worth the cost of the magazine alone!". This is a great way of getting my attention.

Once the install of the minimal kernel is complete, I login as root and then check that there's a set of modules, including the apricot.o module, somewhere among the library files. In my present version of Linux this turns up under /lib/modules/1.2.13/net.

Linux comes with a number of tools for handling modules, and you can get the full list with the command apropos modules. Among these is the insmod (insert module) command. This knows where to find the modules, and knows that modules are .o files, so the command line to add my network driver is just

```
insmod apricot
```

We've now installed the ethernet driver for the device known as eth0, but it's not yet doing anything very useful. You connect it to the network in two stages: first we need to give our eth0 a TCP/IP address, known as the "dotted quad" address. We use the ifconfig networking utility to set this up:

```
ifconfig eth0 192.168.1.25
```

With my own small network setup this means I've given this particular machine the identifying number 25 on a network whose name is 192.168.1.0. (The full story is much more complicated, but let's not worry about that now.) The next step is to tell eth0 where to find the network. For this we need the route utility. Again there are all sorts of complexities you can get into with route, as you'll see if you consult man route, but for now let's just go with

```
route add 192.168.1.0 eth0
```

And that's basically it. If you now run ifconfig and route without command line parameters you'll get a report on the state of play. ifconfig gives something like Fig 2 (there'll also be an entry for lo, the loopback interface). The output from route should look like Fig 3. To check that the network really is connected I can use the old standby, ping, to send test packets to another machine and have them echoed back at me. For this I need the dotted quad address of the second machine

```
ping 192.168.1.3
```

which should give something like Fig 4, confirming the network is now working fine.

Fig 2 Results of ifconfig

```
eth0      Link encap:10Mbps Ethernet  HWaddr 00:00:49:20:26:2F
          inet addr:192.168.1.25  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1176 errors:0 dropped:0 overruns:0
          TX packets:555 errors:0 dropped:0 overruns:0
```

Fig 3 Kernel routing table

```
Destination     Gateway         Genmask         Flags MSS    Window Use
 Iface
192.168.1.0     *               255.255.255.0   U     1436   0      569
 eth0
loopback        *               255.0.0.0       U     1936   0       48 lo
```

Fig 4 Resorting to ping

```
PING 192.168.1.3 (192.168.1.3): 56 data bytes
64 bytes from 192.168.1.3: icmp_seq=0 ttl=255 time=1.7 ms
64 bytes from 192.168.1.3: icmp_seq=1 ttl=255 time=1.4 ms
64 bytes from 192.168.1.3: icmp_seq=2 ttl=255 time=1.4 ms
64 bytes from 192.168.1.3: icmp_seq=3 ttl=255 time=1.3 ms
64 bytes from 192.168.1.3: icmp_seq=4 ttl=255 time=1.5 ms
64 bytes from 192.168.1.3: icmp_seq=5 ttl=255 time=1.5 ms
```

PCW Contact

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Citrix fruit

Terence Green finds a novel solution to running Win32 apps on OS/2, explaining how Citrix WinFrame turns NT into a multi-user applications server. Plus, Warp 5 and the Domino effect.

Several readers have enquired about running Win32 applications designed for Windows 95 and NT. The fact is that for Win32 applications, you have to run Windows NT or Windows 95.

There are some exceptions, but if you absolutely must run Office 97 or Office 95, you have no choice. However, it is not all gloom because there are some alternative paths. Applications written to Win32s up to version 1.25 will run on Warp. If you do a little digging around you may even find that some supposedly Windows 95 applications are actually Win32s. And remember that you only have to run Windows NT or Windows 95 if you cannot find a suitable OS/2 application.

All the news seems to be about Windows, but this doesn't mean that OS/2 applications don't exist. It's only that they're not likely to be reviewed or written about in the popular press. Blame IBM's past folly for that. At least now, if you've upgraded to Warp 4 and seen the Application Sampler, you know there are loads of OS/2 applications out there. You'd be amazed at what you can find by searching the internet.

Another course of action is to select applications that do not mandate Windows: Lotus SmartSuite 97, for example. SmartSuite runs on Windows and Warp, which gives you more flexibility — especially if you are supporting a mix of users. The Windows version is shipping in the United States as I write and an OS/2 version will soon be ready. Non-US versions will take a little longer and OS/2 versions a while longer still, but the Warp version of SmartSuite 97 should pitch up by about mid-1997.

Just add Citrix

A more novel solution for running Win32 applications on OS/2 is Citrix WinFrame 1.6 or later. WinFrame turns Windows NT into a multi-user Windows applications server and supports clients running a variety of operating systems including OS/2 version 2.11 or better (Fig 1).

Win32 applications run on the Windows NT WinFrame server and OS/2 clients view the display in a Warp Win-OS/2 session. Wyse and Insignia offer similar solutions for Windows clients using technology licensed from Citrix (www.citrix.com) but only Citrix WinFrame ports OS/2 clients.

Citrix WinFrame is a specialised solution that won't suit everyone and isn't cheap, but it's very much in tune with the idea of OS/2 as a networked client in a network computing environment.

For the right applications and processes, the WinFrame model enables large companies to manage multi-platform networks more easily and to have more choice over the client hardware. Instead of equipping everyone with fast Pentiums with multi-gigabyte drives and 32Mb RAM, you can make better use of older hardware by serving up remote applications.

The WinFrame model is pretty similar to network computing with Java except that it delivers existing Win32 applications while

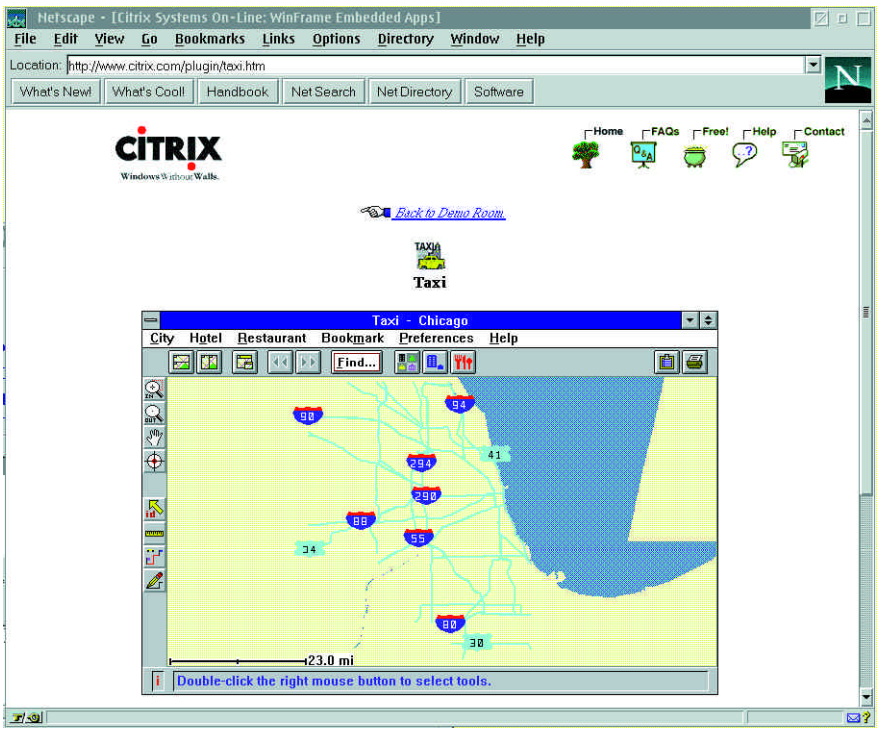

Fig 1 With the Citrix WinFrame Plug-In for Netscape, it is even possible to work over the internet with Windows applications that are running on a remote server

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Points of support

■ **OS/2 Central on CompuServe**
GO:OS2CENTRAL has been started to provide discussion and support for all areas of OS/2 Warp. One of the founder companies, Creative Systems, produces the CompuServe OS/2 offline reader, Golden CommPass, and has acquired rights to the CompuServe Information Manager for OS/2 (OS/2-CIM).

■ **Drivers**
• Epson Germany is developing drivers for several printers in Epson's Stylus range. The drivers aren't free. Send mail to novasta@ibm.net for details.
• If you have a WinTV card take a look at the WarpTV page at www.wdi.co.uk/os2tv/download.htm for the driver situation.

we're waiting for Java to get real. Of course, when there are Java applications, they will be just one more ingredient which can be added to the mix available to network computing clients alongside WinFrame.

Warp 5.0

Java is coming along nicely. Java 1.02 is now GA (or generally available — IBM's way of saying "shrinkwrap") along with the Java 1.02 Just in Time (JIT) 2.0 compiler for Warp 4. Java 1.02 for Warp 3 and for Warp Server is pencilled in for this summer and Java 1.1 for OS/2 should be ready by the autumn.

Shrinkwrap, as a physical entity, is set to shrink as software companies begin to explore alternative software delivery methods. With network computing in mind, software is bound to reduce in size and more packages will become available electronically. In particular, IBM and Lotus are experimenting with software delivery via the internet and one of the plans is to offer Warp upgrades online (as hinted at by me in my previous column).

IBM will deliver well over a dozen different updates to Warp 4 this year. The sum of the updates, which includes SMP support, TCP/IP 5.0 and Java 1.1, will take Warp 4 to its next major version. Warp 5 is pencilled in for a 1998 release, about 18 months after Warp 4 shipped.

Users can choose which updates to receive. An OS/2 user in a traditional network might concentrate on the client/server enhancements to NetWare, Windows and Unix connectivity. By contrast, a network computing OS/2 user might be more interested in the TCP/IP, Java and network security modules.

With effect from next month the service will be chargeable, available to any Warp 4 user with a modem and internet access. It is like buying Warp 5 on an instalment plan.

Warp updates

All the discussion of how few applications there are for Warp, and how much choice there is in the world of Windows, can make for depressing reading, but more often than not this ignores the fact that Warp is often the first platform to have real leading-edge capabilities. Put another way, Flash now seems more popular but Jif was the first.

I was reminded of the way in which OS/2's advanced capabilities often go unsung when I read the header of some email I received from a former *PCW* columnist, now working for a rival publisher.

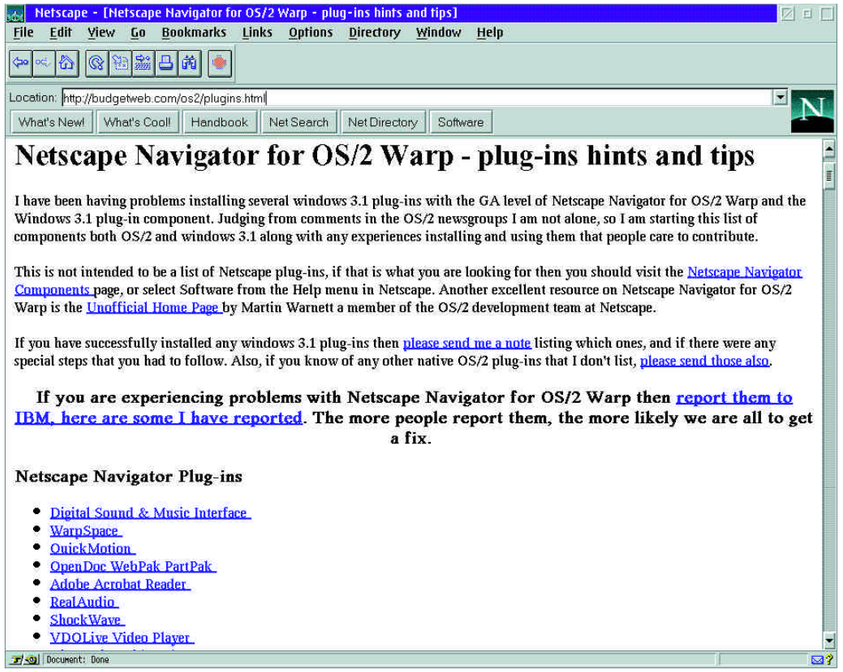
In the header of his message I noticed that his organisation was using an OS/2 SMTP mail gateway. As it happens, Lotus now has a gateway that runs on Windows NT, too, but it made me think of all those years during which OS/2 provided the backbone of that organisation's email system. I suppose in some ways, OS/2 is doomed to be first!

Interestingly, IBM, through its Lotus subsidiary, is now cashing in on the widely held perception that Windows NT is the one and only future direction of server computing, although it irritates OS/2 fan-club members no end. Because OS/2 used to be the preferred platform for Lotus Notes, it is now Windows NT that leads out new Lotus releases. Naturally, Lotus continues to ship multiple-platform versions including OS/2 Warp thereafter, so there is always a choice of platforms.

There are sound business reasons for this change. A lot of marketing money is being thrown at Windows NT and, as it is free, it therefore makes sense for Lotus to utilise it. Additionally, it makes it easier for Lotus to compete directly against Microsoft's groupware and office suite, and for users to compare the two.

Somehow, as much as I like Warp's stability and user interface, I do not think that facing-off SmartSuite for OS/2 against Office 97 would have been a successful business decision.

Fig 2 **This very useful Netscape Navigator for OS/2 support page helped me to get Plug-Ins running in Warp**



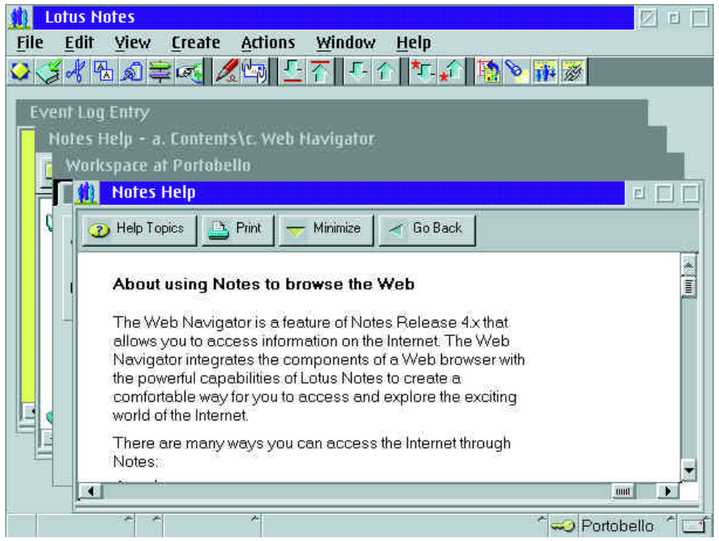


Fig 3 **Lotus Domino 4.5 runs on OS/2, all versions of Windows, the Mac and Unix systems**

Domino spotted

The Plug-Ins Hints and Tips page for Netscape Navigator for OS/2 Warp at budgetweb.com/os2/plugins.html is a mine of information and useful even if you don't think you'll be using Plug-Ins (Fig 2).

The latest downloadable version of the Lotus Domino web server, version 1.5a for OS/2 (and several other platforms), is on the Lotus web site. There is a lot said and written about the difficulty of making money on the web but not much about saving money on the web by delivering timely and effective support, let alone saving money by using web-based support.

The "a" in the Lotus Domino Web Server version 1.5a refers to a security update which corrects a problem in version 1.5 where a web browser coming in from the internet (not on a LAN) could impersonate a user. Lotus was informed via the web and used the same medium to deliver a fix and notify users. It was a web problem, but as with Netscape and Microsoft when they discovered security holes in their products, the web helped Lotus and its customers in a timely manner.

The other point of note about Lotus Domino 4.5 (Fig 3) is that it is the add-on which devoured its host. Originally (less than twelve months ago) Domino merely added web protocols to the Lotus Notes server. Now, Lotus has changed the name of its flagship multi-platform groupware application development environment from Lotus Notes to Lotus Domino. From Release 4.5, the Notes name is only retained by the Notes desktop clients. As the pace of web development hots up, it is only a matter of time before newer developments like the IBM/Netscape link-up and consequent Netscape Communicator groupware web client, reduce the importance of Notes clients.

■ *I have received some Warp Server tools from a reader with a very large network, and have been given a pointer to a couple of Java games, all of which I hope to be able to bring you next month, plus some network-specific advice for Warp and Warp 4 users.*

On the CD-ROM

Having burnt my fingers on beta timeouts I am now wary, so the follow-up to last month's cover-mounted CD is an OS/2 Dialer in version 1.0, a totally pointless Simpsons guide and a pair of Novell updates, the OS/2 Utilities for NetWare 3.12 and 4.10, plus the latest NetWare OS/2 Client V2.12.
The self-extracting ZIP (run it to expand onto a drive from which it can be installed) requires in excess of 6Mb of free space.

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Bookmaking for beginners

Tim Nott shows you how to make five come alive as he presents a solution to the perennial problem of producing A5 booklets in Word. Plus, coloured margins and the right accent.

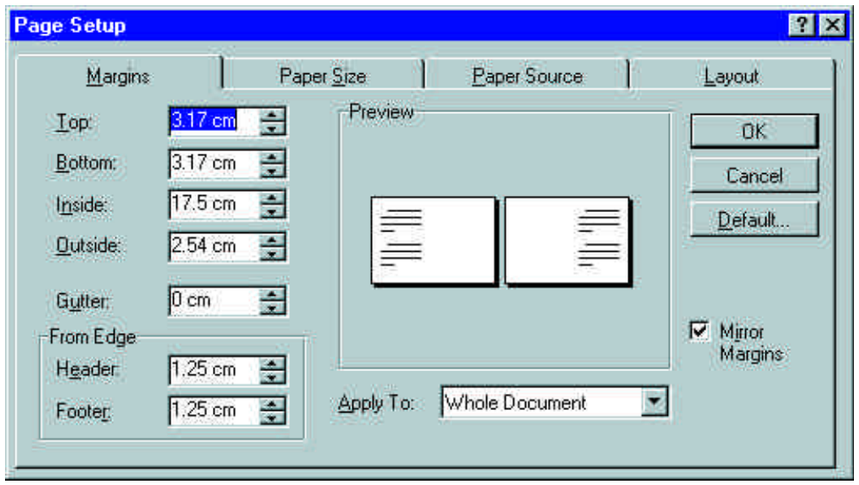
The vexed question of A5 booklets has bubbled away in these pages for some time. Mike Samuelson asks if anyone has come up with a simple way of doing this in Word. For those of you who weren't in at the start, the problem is this. You want to print two pages side-by-side on a sheet of A4 paper, and fold the sheet (or several sheets) in half to make a booklet. In the simplest, four-page case, pages four and one are on one side of the paper, pages two and three on the other. With eight pages, it goes 8-1, 2-7 on the first sheet, 6-3, 4-5 on the second. And so on, with a sixteen-page booklet going 16-1, 2-15, 14-3, 4-13 etc.

If you want a simple way, then here goes. For argument's sake, let's say this is an eight-page booklet called "Cooking With Carrots" by B. Bunny. Go to Page Setup, under Page Size choose A4 and under Orientation choose Landscape. From Layout select Different Odd and Even and choose Different First Page in the Headers and Footers panel. Make sure Apply to: is set to Whole Document. Go to Margins and tick the Mirror Margins box. You'll notice the Left and Right change to Inside and Outside. Set Inside to 17.5cm, Outside to 2.5cm. You can fine-tune this further, but the principle is that the inner margin should have 14.85cm (half the sheet) added to it. Close the Page Setup dialog and go to View/Headers and Footers. On the first page you probably won't want either, so go to page two. Click in the header panel and type "Cooking With Carrots". In the footer, insert Page Number. On page three, put the author's name in the header and right-align it. Insert the page number in the footer, as before, and right align that. The remaining headers and footers will be filled in automatically.

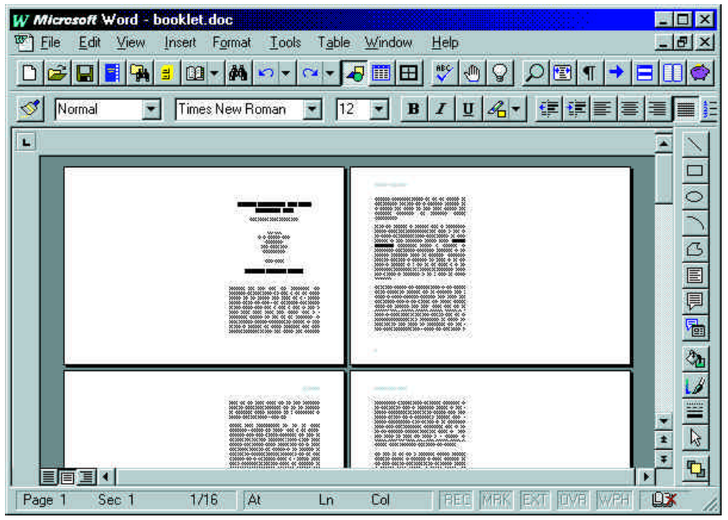
You're now ready to print. Set your printer to single-sheet mode, and from the Print dialog Page Range panel, select Pages and type in "8,1,2,7,6,3,4,5". When the first page is printed, put the paper through again, the same way up. Then turn the paper over, top to bottom and again put it through twice. Repeat with the second sheet. And that's it. You can experiment further, for instance centring the headers and footers or adding a rule with the border tools. The only tricky bit is feeding the paper in the right way around.

In hope of a more hi-tech approach, I searched various online sources of Word wisdom and finally came across a set of macros on the Microsoft web site, dating from November 1994. This included the FormatFoldOverBooklet macro, which "allows you to print multiple pages on a single printed page. The macro copies your document text to a new document window, changes the formatting to two columns, and switches the orientation to landscape. The appropriate page numbers are added below each column."

This sounds just the job except that first, there's a syntax error in the macro that has lain uncorrected all this time, although a further "application note" describes how to rectify this. Having duly mended the macro, it then ground to a halt with a message saying the settings I'd chosen for the margins,



Setting up the page for an A5 booklet



The booklet ready for printing

column spacing or paragraph indents were too large for the page. It did this with a variety of settings in a variety of documents in both Word 6 and Word 7. At this point I did the sensible thing and gave up. Should you, however, have more time to waste than I do, the text of the macro is on this month's CD-ROM in BOOKLET.TXT.

A commanding view

Moving on from a long Word macro that doesn't work, here's a short one that does.

```
Sub MAIN
ListCommands
End Sub
```

This produces a new document consisting of a table showing all the Word menu and keystroke commands together with their menu location and/or keyboard shortcuts, including any keystroke combinations you have assigned. However, there's a rather more elegant variant. Since ListCommands is itself a Word command, you can add it to a menu. Go to Tools/Customise/Menus. From Categories choose All Commands; from Commands choose ListCommands; from Change What Menu pick the menu in which you want to park it. Mine's under "Help" but "Tools" would be equally appropriate. Change the menu position and name if you want to, then click on Add. Running the command from a menu in this way gives you the further option of listing all the Word commands including those which don't have a menu or keystrokes assigned, like those commands used only within macros.

Turning the tables

Last month we took a hard look at Word's inadequacies in the table department. Since then, I've got hold of a copy of the final build of Office 97 and must admit there's been an improvement. You can now align text top, bottom or centre of a cell and rotate it through 90 degrees without recourse to WordArt. This should solve the problem, mentioned last month, of the user who wanted to include a landscape full-page table in a document while keeping the headers and footers in their default portrait position. You can split and combine cells either from a dialog box or by drawing and erasing lines straight onto the table.

Despite the addition of an Autosum button, the mathematical features are pretty much unchanged and have a long way to go to catch up with WordPro or WordPerfect. I really had hoped that at least the formulae would instantly update, as in a spreadsheet, but no — you still have to highlight the field and update it with F9 (or the right-click menu) or wait until you print the document when all fields should be updated automatically. Make sure Update Fields is ticked in Tools/Options/Print.

From the top...

My other disappointment is with the unlovely File/Open… dialog, which remains virtually unchanged. I like being able to specify a search string from the top level of the dialog. It's especially useful when I know I've covered a topic somewhere in a *PCW* article, but can't remember which of

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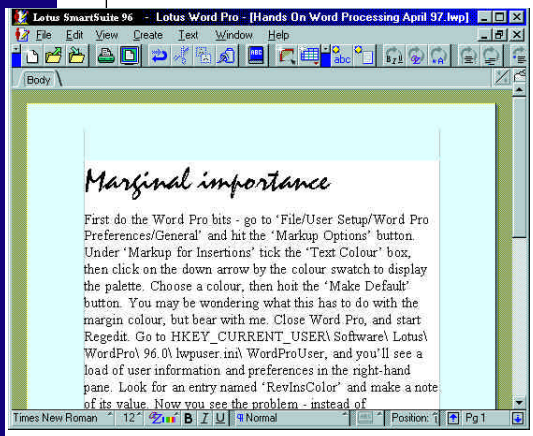
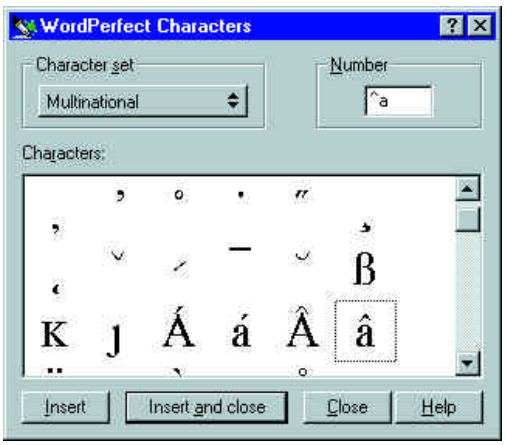
Department of obscure tips…



This one's for Word Pro running under Windows 95. As you may have discovered, in layout view, you can set the margins to appear in a contrasting colour to the rest of the page with View/Set View Preferences/Show margins in colour. What's rather more difficult is to choose a colour other than the default grey — but it can be done. It involves adding a key to the Windows 95 Registry, so the usual caveats apply — back up USER.DAT and SYSTEM.DAT first.

First do the Word Pro bits. Go to File/User Setup/Word Pro Preferences/ General and hit the Markup Options button. Under Markup for Insertions, tick the Text Colour box, then click on the down arrow by the colour swatch to display the palette. Choose a colour, then hit the Make Default button. You may be wondering what this has to do with the margin colour, but bear with me. Close Word Pro and start Regedit. Go to HKEY_CURRENT_USER\ Software\ Lotus\ WordPro\ 96.0\ lwpuser.ini\ WordProUser, and you'll see a load of user information and preferences in the right-hand pane. Look for an entry named "RevInsColor" and make a note of its value. Now you see the problem.

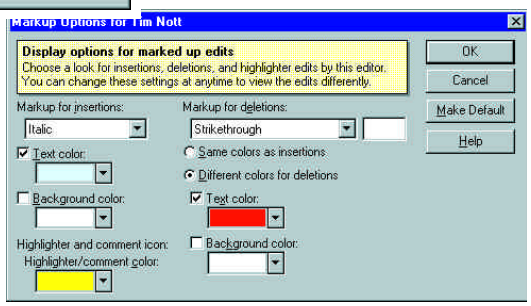
Instead of user-friendly names like Arctic Blue, colour options are stored in the Registry as a number. Create a new String Value by right-clicking in the right-hand pane, and call it MarginsColor. Double-click on this new entry and give it the same number (including any minus sign) as RevInsColor. I must confess I haven't tried this with the Windows 3.1 version, but I would imagine something similar exists in LWPUSER.INI. Close the Registry Editor and restart Word Pro: your margins will now be in the chosen colour, and you can re-set the Markup colour to its previous value. If someone can tell me how to change the background colour, the area "off the page", to something other than the dismal default khaki, I'd be grateful.



Top left Margins in any colour you like — with a bit of Registry tweaking

Above Beyond the keyboard in WordPerfect

Right The secret of finding out the colour code



And here's one for WordPerfect 7 fans. If you want to insert accented characters, or those such as fractions, not normally accessible from the keyboard, then Insert/Character pops up a scrolling box of accented and other exotic characters. You also get the option to choose from other character sets, such as mathematical symbols or Japanese characters. This is a little long-winded if all you want are commonly-used symbols such as °, Ω or the basic accented letters. The keyboard shortcut Ctrl+W also launches the character box, but you can follow this with further keystroke shortcuts like 'e<return> produces an e-acute (é). These are the more common symbols:

- 'a = á (also works with e, i, o, u, y in both upper and lower case)
- `a = à (also works with e, i, o, u, y in both upper and lower case)
- ^a = â (also works with e, i, o, u in both upper and lower case)
- @a = å (also in upper case)
- ~a = ã (also n, o in upper and lower case)
- "a = ä (also e, i, o, u, y in both upper and lower case)
- ,c = ç (also upper case)
- oc = ©
- or = ®
- ae = æ (also upper case)
- ss = ß

the 200-odd DOC files it might be in. So why do we have to dig down into the Advanced settings (or click the obscure Commands and Settings button) to search subfolders? Surely this checkbox should be at the top level?

Unless you specifically save the search, the results are lost when you close the dialog. Word 6's Find File… command at least had the decency to re-open the last set of results, so you could pick and choose without having to repeat the search, or open all the files at once.

To boldly go…

John Carrick was rather puzzled that Word had suddenly started displaying everything in bold type when a new, blank document was created. Stuart Melville wanted to know how to force Word to start with other than 10-point Times New Roman as the default font. "I have a rather elegant Garamond, but it's a drag having to set this manually for every new document." The answer to both queries is in the Format/Font… dialog box.

If you change the font, style, size or other options here, and hit the Default button, this font and options will become the default for new documents. You do get a confirmation dialog, but it's easy to miss if you're in the habit of closing dialogs with the enter key rather than the mouse. This is probably what has happened to John, by accident.

To rectify this, or to choose a new default, choose the settings you want from the dialog box and hit Default again. Don't forget to click Yes when asked to save the template changes. For those of you who have made the upgrade to Word 97, note there's also a Shadow font style as well as Outline, Embossed and Engraved. This looks rather like bold at normal font size, and it doesn't have a button on the toolbar.

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Linking up

Excel 97 offers a number of ways in which to exchange information between a workbook and a web page; Stephen Wells explains how. Plus, Excel 97's hyperlink capabilities.

A worksheet which is specially designed to accept data from a particular web page is called a Web Query. To run one, you choose Data, Get External Data, Run Web Query, then select the particular Query you wish to run from the Run Query dialog box. Excel 97 includes four of them, as I mentioned last month, but one of these is "Get More Web Queries". At present, if you run that when connected to its source, you can download an active sheet with 36 more Queries.

If you have your own web page, it's easy to add a range of a worksheets:

1. Open the page with your usual browser.
2. Choose View, Source, so you can see the HTML code.
3. Where you want the new worksheet data to appear, insert a blank line and then `<--##Table##-->`
4. Save this edited file.
5. Open your worksheet in Excel and select the range you want to add to the web page.
6. Choose File, Save as HTML (Hypertext Mark-up Language). This starts the Internet Assistant Wizard (Fig 1) and you follow a few simple steps. These include browsing to select the .html file you've prepared for accepting the data. When you've finished, the range will appear on the web page.

You also use this Wizard to prepare a worksheet as a web page. It works much better now than when I previewed it last October. If you just accept all the defaults, the Wizard selects enough of the first range of your worksheet to fill a web page, then it creates a new HTML-coded page complete with header, footer and table. This can be opened in Microsoft Explorer or your other favourite browser.

Fig 1 (right) It is easy to save a range of your worksheet as an HTML-coded web page, automatically, using the Internet Asst. Wizard

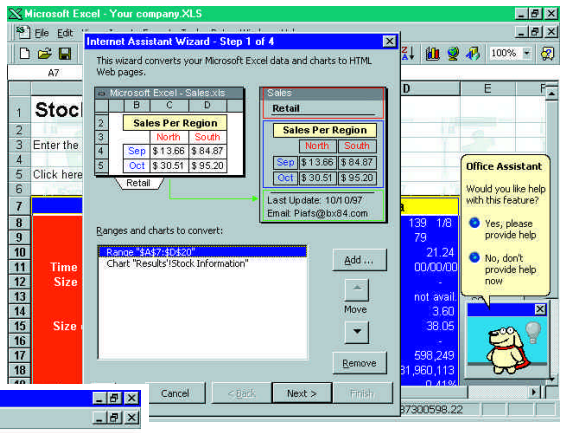
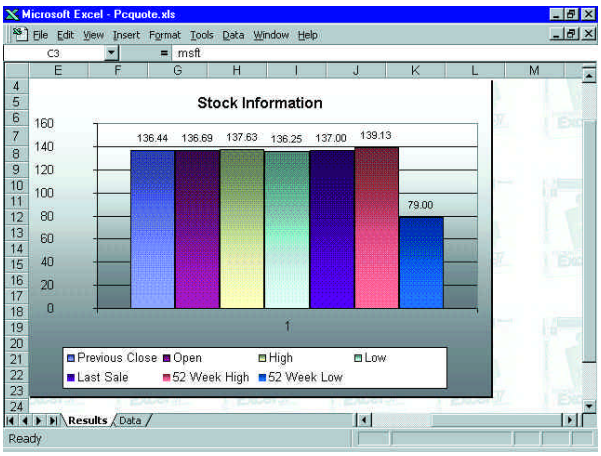


Fig 2 (below) The Excel 97 Web Connectivity Kit includes a template for converting downloaded data into charts



Excel 97 also makes it easy to add an Excel form to your web site which can be used for collecting information for a database. This might be for taking orders from users, or requests for information, or just recording comments. You first create the form in Excel with cells where users will enter their data. Then choose Tools, Wizard, Web Form to open the Web Form Wizard which asks you to select those cells on your worksheet that you wish to have the user fill in, and the labels you wish to give them. It then automatically produces a new .xls file and companion .idc, .htx, and .mdb files. You supply these four files to the web page administrator and you can open the new .xls file, which looks like your original, with a Submit Info button added. This Wizard works best with Microsoft Access 97 and Microsoft Explorer 3.

On this month's cover-mounted CD I've included the complete Excel 97 Web Connectivity Kit. It's the definitive guide to developing sophisticated web sites for Excel users. It also helps you to create special pages on Excel worksheets that will automatically elicit information from company intranets or specific internet web sites. You can learn how to pull daily sales, stock or financial reports from a company intranet server straight onto a worksheet. The Excel 97 Web Connectivity Kit includes an example of converting downloaded data into charts (Fig 2).

Meanwhile, back in the office…

The hyperlink capability of Excel 97 can also be used to improve links with files on an office network, or on your own disks: hard,

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or mounted floppy. If you just want a hyperlink from one Excel worksheet to another without the use of a formula, the easiest way is to select the worksheet data in the destination workbook and then use the right mouse button to drag the information to the worksheet cell that contains the text, button or graphic for the hyperlink. When you release the right mouse button, click Create Hyperlink Here on the shortcut menu (Fig 4).

It's also easy to create a hyperlink between a worksheet and a Word document or a PowerPoint slide. Say you have the text, SEE REPORT, in a cell and the report referred to is a Word document. Just select the cell and then click the Insert hyperlink button on the standard Excel 95 toolbar (or press Ctrl+K). This opens a dialog box where you can browse to find the Word file. Click OK and that's all there is to it. The words SEE REPORT are now an automatic link which opens the Word file when you click them.

As you were

Last month I was saying that Excel 97 allows you to use row and column labels as references, assuming that you've checked the "Accept labels in formulas" box under Tools, Options, Calculation.

I mentioned that in the beta version I tried, this feature easily got confused when one of my labels was "Current Assets" and another was "Current". I also said that if the column heading was a formula, like =B1-1, instead of 1995, then I received an error message even though the sheet displayed

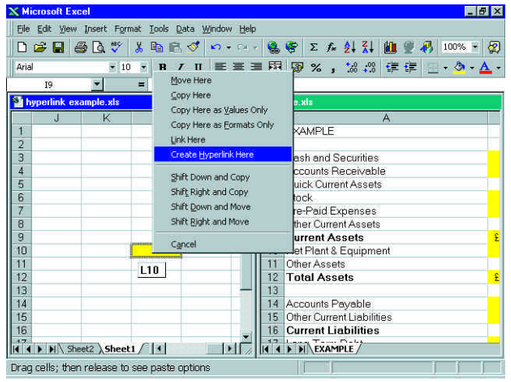

Fig 4 You can create direct hyperlinks simply by dragging a cell from one Excel 97 worksheet to another and right-clicking

1995. I've since received the final version (if there ever is a *final* version) and can report that both of these minor problems have been corrected.

VBA changes

The Excel 97 Visual Basic object model has extensive changes to support new and improved features in Visual Basic for Applications in Office 97. Many objects, properties and methods have been replaced. To provide backward compatibility, most of the replaced components have been hidden rather than removed. They don't show up with the object browser although the existing code that uses the hidden components still works. When you write new code you should use the new objects, properties and methods.

The first thing to get used to is that macros are not displayed on module sheets any more although they are still stored with the workbook. To create or edit a macro you choose Tools, Macro, Visual Basic Editor (or press Alt+F11) and three windows open (Fig 3). Visual Basic now features a single, consistent editing environment for Office programs similar to working in standalone Visual Basic 5.0. Each Excel workbook has a project associated with it. There is an improved code editor, a hierarchical object browser, a multipane debugger, a Properties Window and a Project Explorer to help you view and organise the code and objects in your project.

If you open a workbook created in earlier versions of Excel, Excel 97 preserves macro and dialog sheets and converts module sheets into modules in the workbook's Visual Basic project.

You can run and edit Excel 4.0 macros and Excel 5.0 and 7.0 dialog sheets. To view them, just choose Tools, Macros (or press Alt+F8). You can even add new macro or dialog sheets by right-clicking a sheet tab and then clicking Insert on the shortcut menu. However, it is recommended that you create new macros and dialog boxes in the Visual Basic Editor.

The three largest areas of change in Excel 97 Visual Basic are Shapes, UserForms and Command Bars.

Shapes are drawing objects. The Shape Object is for formatting or modifying a single shape. The Shapes Collection is for modifying all the Shape objects on a specified sheet, such as AutoShape, freeform or OLE objects. The ShapeRange Collection is for modifying a group of Shape objects which you specify.

A UserForm Object is a window or dialog box that makes up part of a custom application's user interface. The UserForms Collection is a collection whose elements represent each loaded UserForm in an application. The UserForms collection has a Count property (which specifies the number of elements in the collection), an Item property (to specify a specific collection member), and an Add method (for placing a new UserForm element in the collection).

CommandBar Objects in Office 97 control the toolbars, menu bars, and shortcut menus in a workbook. Not only can you create and modify custom toolbars, menu bars and shortcut menus for a tailor-made Visual Basic application, but you can also modify any of Excel's own built-in toolbars and menu bar. You can present the features of your application as individual buttons on toolbars or as groups of command names on menus. Because toolbars and menus are both considered to be command bars, you use the same kind of controls for both.

Having installed Office 97, you can find much of the information you need about these changes in the vbaxl8.hlp file. Some useful snippets are in the file xlread8.txt.

Office 97 includes an MS Query Add-In to convert external data ranges which are in Excel 97 format to Excel 5 for Windows 95 format. This is not so much for making Excel 97 data available to version 5/95 users, as for allowing Excel 97 users to run macros created in Excel 5.

EXCELlent changes in Excel 97

- The Chart command on the Insert menu now starts the Chart Wizard. On step four of the Chart Wizard, you can specify whether the chart is inserted as an embedded object on a worksheet or on its own chart sheet.
- The Office Assistant has replaced the TipWizard from versions 5.0 and 95, and includes Answer Wizard IntelliSense technology from version 95. When you need Help, just click the Office Assistant button and ask the Assistant a question in your own words. When a yellow light bulb appears in the Assistant, a program tip is available: click the light bulb to see the tip.
- Cell notes are now called comments. Use the Comment command on the Insert menu to create a comment. You can view comments in the same way that you used to view notes: by resting the pointer over a cell that has a comment indicator (this is a red triangle in version 97) in the upper right-hand corner of the cell.
- The Info Window feature is no longer available in Excel 97. To locate cells that provide data to formulas, use the Auditing toolbar.
- The Shared List command has gone from the File menu. In Excel 97 you can use shared workbooks to create and edit formulae, change formatting, create and change charts, and even add sheets. To share a workbook, click Share Workbook on the Tools menu.
- Sound notes have also been dropped from Excel 97.
- To start the PivotTable Wizard, choose the PivotTable Report command on the Data menu.
- The View Manager command has disappeared from the View menu. Use the Custom Views command on the View menu to save a custom view of a workbook. Custom views have been integrated into Excel 97 and this command no longer requires an add-in program.

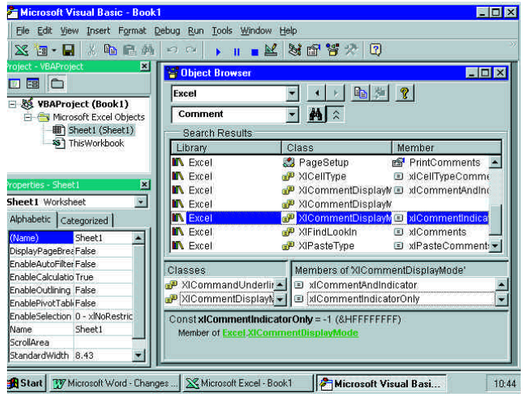

Fig 3 The new Visual Basic editing environment is the same in every Office 97 application and it's all graphically orientated

Right on the button

I recently received a fax from Jeff Forrest, who is working in Paris for a company that has internal email only. Jeff offers the tip that if you run out of suitable button designs for your macros in Excel, you can borrow one from Word.

If you have MS Office 95 or 97, start Excel and Word. If you choose View, Toolbars, Customise, Commands, All Commands in Word, you're offered a wide choice of button designs, any one of which can be dragged onto any toolbar (temporarily).

Right-click on this button and choose Copy Button Image. Drag the button off the toolbar to dispose of it, then switch to Excel. Whenever the Toolbars Customise dialog box is open, the same shortcut menu is available in Excel, so now you can right-click on the button which starts your macro and choose Paste Button Image. This new button will be stored in the Normal.dot template and will stay on the toolbar until you wish to remove it.

On the *PCW* CD-ROM

If you have Excel 97 and Word 97 installed on your computer, you can use the Excel 97 Web Connectivity Kit described here. From the cover CD, copy the self-extracting zip file, WEBCNKIT.EXE, into the folder of your choice on your hard disk and double-click on the icon to expand the files. Follow the instructions in WebCnKit.doc to use the various sample files. Descriptions of the files are in this document's appendix.

A case in point

In his correspondence, Jeff also included a macro for changing the case of selected text. I entered and checked his module and it worked fine, but as I had covered that subject extensively (in my January column), I wasn't going to mention it.

But then I received an email from Andy Male: "I read with interest your article on changing the case of text within Excel. I'm using Excel 5.0 and have successfully created a macro button that will change the case of a single cell. I am trying to amend the macro so that I can change the case of a single cell, or a selected range, but despite hours of effort I have failed. The macro I'm using for the single cell is:

```
Sub titlecasecell()
    ActiveCell.Value = Application.
Proper(ActiveCell)
End Sub"
```

So all of a sudden, Jeff's macro became immediately useful. He had written:

```
Sub MakeProper()
Dim myCell As Object
For Each myCell In Selection
If Left(myCell.Formula, 1) <> "="
Then
myCell.Value = Application.Proper
(myCell.Value)
End If
Next myCell
End Sub
```

I sent this to Andy, who replied: "Thanks for your help — that cracked the problem. I guess it's simple when you know how!" I hope they both see this so that Andy knows where the solution came from and Jeff knows that he did a good deed.

Keyboard conundrum

Roy Small emailed me with an interesting dilemma. "I have a persistent keyboard problem with Excel 7.0 and Word 7.0 . When I type a repeating comma (,,,,,,,) I get repeating (.....) full stops. It only happens in these two applications and I have tried reinstalling twice, but to no avail. In the Turnpike editor and in Wordpad there is no problem. My system is an Escom P60 with 16Mb and Win95. Word 5 and Excel 5 did not have this problem. All the country settings are correct.

"I am loathe to delve into the registry unless I know what I'm looking for. I would appreciate a pointer in the right direction if you are aware of this problem."

I replied: "If you're getting correct results with other software, then it can't be a keyboard mapping problem.

"You might check all the AutoCorrect and AutoText options. If anyone else has used your PC, they might have changed something, either consciously or inadvertently. Also (and this is something that often frustrates me) languages are set in every template. You can't just set English (British) once. It can turn back to English (US) or, perhaps in your case, Swedish or something, in different templates.

"If it's any comfort, it's not a bug in Excel 7 or Word 7 as nobody else has had the problem as far as I know."

He responded: "Brilliant, Stephen. I can't thank you enough. It was indeed the AutoCorrect setting. I don't understand why or how it ever got set that way because only I use this machine and I have never found that setting dialog before. Changing the setting in Word also affects Excel."

PCW Contact

Stephen Wells welcomes input on all spreadsheet matters. Write to him at *PCW*, or email spreadsheets@pcw.vnu.co.uk

All buttoned up

Mark Whitehorn presents another slant on last month's buttons and captions query, which is far from sewn up. Plus, the complexities of data entry in Access, and CUSTOMER care.

In the February issue I published a letter from Glen Rowe. He wanted multiple buttons on a form, all with different captions. Whenever a button was pressed, a query would run which returned values based upon the caption on the button. For example, if you press the button labelled "Penguins" you see the records which relate to Penguins: pressing the "Fish" button yields information about Fish. I produced a solution by building a query which snatched the caption from the button which had just been pressed.

I also wrote the following: "The obvious solution at first is to try to pass the button's caption to the query as a parameter. As far as I know (and I stand to be corrected) this can't be done."

James Talbut replied: "Passing a parameter to a parameter query in Access can be done, but it's not very pleasant and means the you need to use DAO (Data Access Objects), which can be good or bad depending on the circumstances."

The solution that James then provides does, as he suggests, pass a parameter to a parameter query. What it doesn't do is pass the *caption* of the button as a parameter (which is still, as far as I know, impossible). In turn, this means his solution is somewhat more awkward than the one shown in the February issue because every button you add to the form must have its caption *and* its OnClick property altered. With the February solution, all you had to do was clone the button and alter the caption. However, James's solution to the initial problem is still well worth studying since it illustrates a very different way of solving the conundrum.

He continues: "Before I include all the bumf to show you how it's done, I'll just mention the implications.

"To actually access the resultant data you need to use DAO to step through a recordset. If you have a large amount of data this can be inefficient (OK, it's always inefficient, but it's more noticeable with a large dataset), particularly if you are intending to perform some secondary operation/selection on the data. However, the query itself is still run by the JET engine so the main data manipulation routines are still run as quickly as Access can do them.

"To control the parameters you need to use the Parameters collection of the QueryDef object for the query you are interested in. The most simple example I could come up with looks like this:

Table: "People"

ID	Name	Value
1	Fred	1
2	Jack	4
3	Fred	9
4	Harry	16
5	Anastasia	25
6	Bob	36
7	Martin	49
8	Stephen	64
9	Harry	81

(See Fig 1.)

```
Fig 1 Query, "Person":
SELECT DISTINCTROW People.ID, People.Name, People.Value
FROM People
WHERE (((People.Name)=[Person]));
```

```
Fig 2 Form Code, behind "People"
Private Function Button_Click(sName As String)
Dim qdfPeople As QueryDef
Dim rsPerson As Recordset
Dim sRowSource As String

Set qdfPeople = CurrentDb.QueryDefs("Person")

 qdfPeople.PARAMETERS("Person") = sName
 Set rsPerson = qdfPeople.
OpenRecordset

 While Not rsPerson.EOF
   If Len(sRowSource) > 0 Then sRowSource = sRowSource & ";"
   sRowSource = sRowSource & rsPerson.Fields("Name") & " - " &
rsPerson.Fields("Value")
rsPerson.MoveNext
 Wend
 List10.RowSourceType = "Value List"
 List10.RowSource = sRowSource
End Function
```

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Form, “People”:
Six command buttons, each with their OnClick property set to:

```
=Button_Click(“Fred”)
```

with Fred replaced by the caption on that particular button. The buttons are labelled Fred, Bob, Harry, Martin, Anastasia and Stephen. At the bottom is an empty list box called List10.
(See Fig 2, page 285.)

“And that’s it. Hope it’s useful.”

Very interesting, James. I have constructed an example file (in Access 7.0) based on this example called TALBUT.MDB which is on the CD.

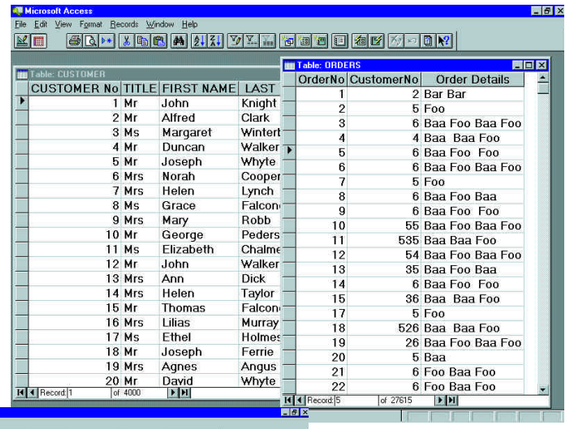
Next an email from Norway: “I have a problem that I’ve worked on for several months now, without finding any easy solution,” *writes Tore Saetre, of Bergen*. “I’ve developed and am maintaining a Microsoft Access database that keeps track of customers. The database contains two main tables: Customer and Sales. The problem is that I need to have a field in the Customers-table that shows how many orders the customer has in the Sales-table.

“My first idea was to make a query that counts orders in Sales for each customer. The query lists each customer and how many orders the customers has. I tried to move that value to the Customer-table with an update query that updates a NoOrders-field in Customer through a link to the first query. The problem is that the first query can’t be updated and the second query won’t update my Customers-table.”

I receive many questions like this one, questions which hinge upon the desire to store redundant data in tables. My initial reply to Tore was that, in general, storing derivable data is a bad idea because if the data changes (as you make more sales), the data in the CUSTOMER table goes out of date. It is normally preferable to use a query to calculate the information you need: whenever you want to see this data, you can run the query which shows you the customer details and the number of sales.

Tore was only partially convinced and replied: “But data in the sales table is only changed and added to once a month. The rest of the month the user browses through CUSTOMER’s 4,000 records and needs to see as much data on each customer as possible. Running a query for each customer is too time-consuming. I see why it can’t be done in a ordinary customer/sales database, but I still hope to find a solution to this problem.

Fig 3 (right) Small samples from both the CUSTOMER and ORDERS tables in the database “Tore”



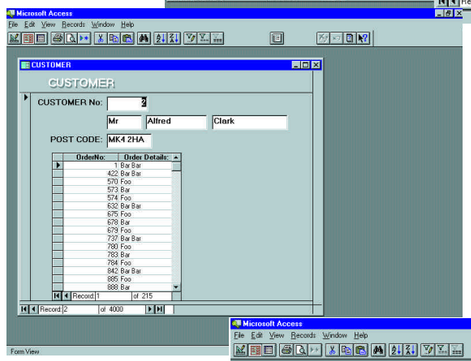
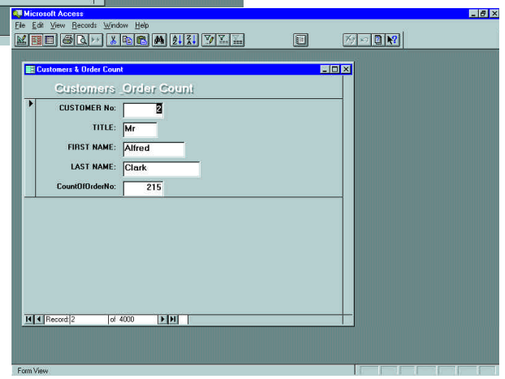


Fig 4 (left) The form called “Customers & Orders” shows customer details and order details

Fig 5 (below) The form called “Customers & Orders Count” shows one record for each customer



“For an experiment, do you have an example of how I can run a query to see customer details based on the customer currently displayed in a form? Do I need to run a code, macro or function and how do I get the query to filter everything but the record on-screen? Thanks for your help.”

Okay, we’ll solve this one both ways. There is a sample database on the cover CD (in Access 2.0) called TORE.MDB. This has two tables ,CUSTOMER and ORDERS. CUSTOMER contains simple details of 4,000 mythical people, ORDERS contains about 27,500 orders. Each customer has at least three orders to their name (or, in this case, to their CustomerNo) and some have considerably more. Fig 3 shows small samples from both tables.

The form called “Customers & Orders” (Fig 4) shows customer details and order details. The main form is based on CUSTOMER, the sub-form (which is called Sub1) is based on a query which simply performs a join on the two base tables. This form displays one record for each of the 4,000 customers.

The form called “Customers & Orders Count” (Fig 5) again shows one record for each customer. However, instead of listing the details about each order, it simply shows how many orders each customer has placed. This form is based upon the query called “Customer & Order Count”.

These two forms are variants which answer Tore’s request for an “example of how I can run a query to see customer details based on the customer currently displayed in a form”.

I ran this database on a 486/100 with 16Mb of RAM using Access 2.0. “Customers & Orders” opens almost instantaneously, and you can scroll through the records at the rate of about 400 per minute. “Customers & Orders Count” takes about 25 seconds to open, but once open you can scroll through the records at the rate of about 1,600 per minute.

To put this into simplistic terms, the first one does the calculations for each record as you ask to see it (which is adding about 0.1 seconds to the scroll time between each pair of records). The second one does all of the calculations for all of the records before showing any of them to you.

These forms are simply based on queries: no code or macros are required. As you can see, using the first form, it is possible to see customer and order details with essentially no speed hit at all for these numbers of records.

The query called “Customers & Orders Count” (the one which takes 25 seconds to run) can also be used, if required, to create the base table that Tore requested. I have included a Make-Table version of the same query in TORE.MDB. If you run this, it will create a base table called CUST which is just like CUSTOMERS except that it includes a field which shows how many orders each customer has placed.

In Tore’s case this could be run once a month, and then CUSTOMERS replaced by CUST; in that case, the 25-second speed hit disappears. The downside is that we are now reliant upon redundant data in the database. If anyone forgets to renew the tables at the end of the month, then all of the users of the database start to work with inaccurate data. You pays your money, you takes your choice — speed or security.

Quickies

■ Here’s a quick one from Gareth Wade: “When running a simple Report, I need to add all the time lengths and give a running

Fig 6

```
Private Sub LastName_AfterUpdate()

End Sub
```

Simply add a line so that it now reads;

```
Private Sub LastName_AfterUpdate()

    Me!LastName = StrConv(Me!
LastName, 3)

End Sub
```

Fig 7

```
Me!LastName = StrConv(Me!LastName, 3)
```

Fig 8

```
Private Sub LastName_AfterUpdate()
Dim Length As Integer

Me!LastName = StrConv(Me!LastName, 3)
If Left(Me!LastName, 3) = “Mac” Then
   Length = Len(Me!LastName)Length - 3)
   Me!LastName = StrConv(Me!LastName, 3)
   Me!LastName = “Mac”  Me!LastName
End If

If Left(Me!LastName, 2) = “Mc” Then
   Length = Len(Me!LastName)
   Me!LastName = Right(Me!LastName, Length - 2)
   Me!LastName = StrConv(Me!LastName, 3)
   Me!LastName = “Mc” + Me!LastNameEnd If

End Sub
```

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total. Easy enough; but when Access gets to 23:59, it reverts back to 00:00. What format do I use to carry on past that magic 24-hour mark ? I have tried all the manuals and help files but can't find the answer."

I don't know the answer to this one. Anyone else care to solve it?

■ And this one from Malcolm Rowley: "I find I am put off by the complexity required in Access to solve simple problems, e.g. data entry character formatting.

In Alpha I simply have to specify the word/character format I require, e.g. Upper, Lower, Word (first character upper case, the rest of the data left as is) in the field rules, and this is applied to all data entry that takes place and can be re-applied to all existing data. This is ideal for data entry of names and addresses; the only difficulty being the McCartneys (etc.) of this world. To have any simple form of formatting that stores the data in an access table in a particular format, do I really have to resort to code? Is there a simple way of accepting data entry in Access and storing it as first character upper case, the rest left as is?

For example: macdonalds becomes Macdonalds / macIntyre becomes MacIntyre / 27 park avenue becomes 27 Park Avenue. A simple solution would be appreciated."

The answer is that you have to use code, but only one line so it may just meet your requirement for simplicity! Suppose you have a form called Capital which displays a field called LastName in a text box called LastName. Switch to design, double-click on the textbox in question, select the Event properties, click on the one called "After Update", click on the ellipsis button which appears (three dots) and choose Code Builder. Between the two lines which appear (Fig 6) "Me" means the current form, "LastName" is the name of the textbox, and "StrConv" is a function (only available in Access 7.0 and above) which converts strings. The "three" tells the string conversion function to do the type of conversion that you asked for (capitalising the first letter of each word).

So, Fig 7 means "make the contents of the textbox called LastName equal to the same as it is now, but with all of the first letters of the words capitalised". This will convert: penguin penguinsson to Penguin Penguinsson / 23 the larches to 23 The Larches / mcdonald to Mcdonald and so on.

■ On a slightly different tack, I haven't used Alpha for well over a year, but I agree that

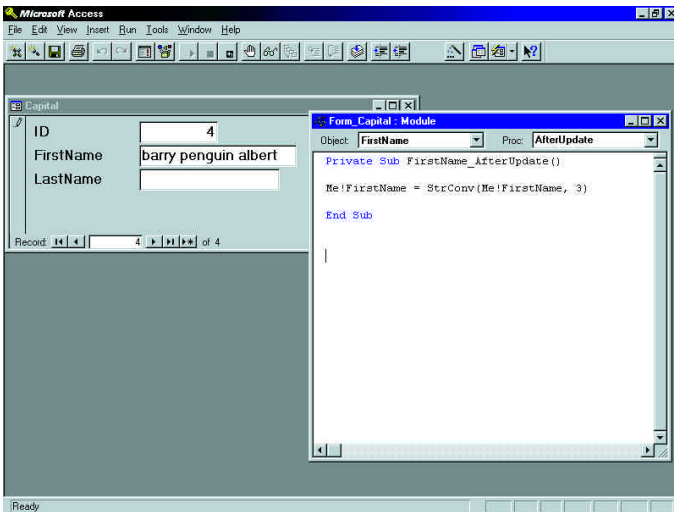
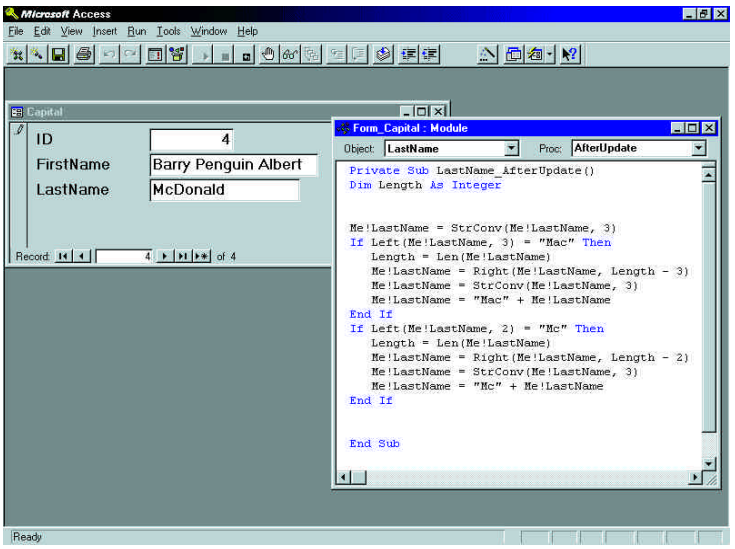


Fig 9 (left) This single line of code will capitalise all distinct words placed in the FirstName field *(see Fig 10)*

Fig 10 (below) This more complex code capitalises two of the more complex surname types in the LastName field



processes like this one are easier (and certainly more intuitive) in Alpha than in Access. In fact, to quote from a review I wrote at the time of its release: "…of these, the Field Rules are the most impressive, if only because Alpha copes with them better than any other RDBMS I have seen."

There is clearly a trade-off in design terms, which these two products exemplify. In both products, the designers identified a host of commonly needed functions and made them easily available from the interface. This approach has pros and cons. The good news is that commonly performed processes (like designing tables and building queries) are easy: the bad news is that if you happen to want a function that the designers didn't provide, you suddenly have to go to a more complex area, such as coding.

One difference between the two products is where the line was drawn. In this case, the Alpha designers decided to include capitalisation in the "easy" set and the Access designers didn't.

I have always found that, whatever product I use, I eventually reach a stage where I have to use code simply because it is impossible for the designers to put everything into the "easy" set. On a happier note, once you do start to use code, your horizons expand considerably. You can, for example, begin to deal with unusually capitalised names like those you mention. If you expand the code to that shown in Figs 9 and 10, this will change macdonalds to MacDonalds, and mctavish to McTavish. (Also see the Access 7.0 sample database called ROWLEY.MDB.)

I am not suggesting that this is perfect code. As usual in the sample code I give, there is no error trapping. In addition, there are some people who prefer the letter after Mac or Mc to be left in lower case. This code is simply provided as an example of what can be done.

PCW Contact

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column at database@pcw.vnu.co.uk

Mods and rockers

Mike Mudge JAMS with mod sequences. No, he hasn't joined a retro band; here he presents a stimulating exercise in occurrences to get your feet tapping and your calculators clicking.

JAMS, or Jonathon Ayres Mod Sequences, are believed to have their origins in Leeds in the autumn of 1996. I am indebted to Jonathon for the following presentation of the idea which both he, and I hope readers of this column, will find interesting and stimulating.

Mod sequences

The mod sequence is defined as
X(n) = (2*X(n-1)+1) mod n
where n starts at 1 and x(0) equals 0. The first few numbers in the mod sequence are 0, 1, 0, 1, 3, 1, 3, 7, 6 and 3.

1. Occurrence of X

When does a number occur in this sequence? The first occurrence of the numbers 0 to 19 in the mod sequence are shown in Fig 1.

All numbers less than 1,000 occur in this sequence, for n less than 10,000,000, with the exception of 204, 344, 614, 622, 876 and 964. These first occur at:

X(n)= 614, n= 10629529
X(n)= 204, n= 15245143
X(n)= 344, n= 26713415
X(n)= 622 n= 47286732
X(n)= 964 n= 67815823

I have not been able to find the first occurrence of X(n)=876, but if it does occur n is bigger than 75,000,000.

2. Special values of X(n)

- X(n)=0 for n = 1, 3, 79, 35, 431, 1503, 2943, 6059, 6619, 18911 and 54223.
- X(n)=n-1, for n=1, 2, 8, 32, 46, 392, 12230, 155942, 659488, 1025582, 10471228 and 3437088
- X(n)=n/2, for n=2, 78, 234, 430, 1502, 2942, 6058, 6618, 18910 and 54222
- X(n) and n end in the same last four digits for n=34875, 52363, 54975 and four others less than 100,000, and with the last five digits of both the same, the only values of n less than 1,000,000 are n=389103, 469599 and 742955.

3. Distribution of X(n)

- The most common occurring values of X(n) are of the form 2^p-1, so that for n less than 1,000,000, the number 63 occurs 47 times.
- The average value of x(n) is about n/4.
- There are no values of n greater than 1 so that X(n)=X(n+1), but for X(n)=X(n+2) this is true for n=6, 7, 12, 13, 24, 25, 174, 175, 2448, 2449, 3072, 3073, 6768 and 6769.
- X(n)+1=X(n+1) is true for the values of n, n=3, 5, 81, 237, 433, 1505, 2945…

Fig 2 shows the first values of n so that X(n)+a = X(n+1). All values of **a**, less than 500, occur for **n** less than 10,000,000 except for 205, 215, 345 and 391.

- For pairs of numbers x and y, y is at most 2x+1. The values of x where y has values other than 2x+1, are x=1,3,6,7,13,14,15, 16,17,18,20,23...

Supernumerary

- On 6th December, Tony Forbes of Kingston-Upon-Thames announced his discovery of a triplet of 1,083-digit primes, believed to be the largest known prime triplet. *(Further details of these numbers and the underlying theory/computation on request — MM.)*
- Anyone who knows the means of obtaining a "zooming Mandlebrot plotter" please email Gogul@aol.com.
- Anyone wishing to get involved in the "Great Internet Mersenne Prime Search" mentioned in *PCW* (Jan) should contact Nigel Backhouse, Division of Applied Mathematics, University of Liverpool, M&O Building, Liverpool L69 3BX (*Kevin Edge, please note).*
- In response to frequent requests for reasonably priced (or free) software for long integer manipulation: I can provide UBASIC free of charge on receipt of a suitably stamped, addressed, padded bag.

Fig 1

First occurrences of the numbers Y, Y=0 to 19, so that X(N)=Y

Y	N	Y	N
0	0	10	149
1	2	11	27
2	53	12	91
3	5	13	18
4	71	14	21
5	26	15	17
6	9	16	43
7	8	17	20
8	19	18	29
9	72	19	50

Fig 2

First values of n so that X(n)+a = X(n+1)

A	X	A	X
1	3	11	151
2	6	12	29
3	55	13	93
4	9	14	64
5	73	15	29823
6	28	16	33
7	63	17	45
8	18	18	42
9	21	19	71
10	74	20	52

Numbers Count (*PCW*, September '96) — 'Fraction Action'

- Gareth Suggett obtained successive length records for the period of the continued fractions of the square roots of the non-square integers up to d=10,000, terminating with d=9,949 having cycle length 217. However, Gareth discovered a program called "CALC", written by KR Matthews of the University of Queensland. The MSDOS version is available from the Mathematics Archives ftp site: ftp://archives.math.utk.edu/software/msdos/number.theory/krm-calc. On a 25MHz 386 PC, each of the 10-digit results quoted in the original article can be obtained in about 20 minutes. The final 11-digit result was confirmed on a 133MHz Pentium in 15 minutes, producing a 6.8Mb output file!

John Borland observed that at some time, "continued fractions were a standard topic in higher mathematics". Readers' experiences of instruction in this topic would be most interesting, together with their personally recommended reference books both for numerical and function approximation theory applications.

This month's prizewinner, however, is Duncan Moore of Birkenhead for his major contribution to "Something Different", spread over August 1993 and January 1997. The total number of solutions now known is 30.

Also in relation to this problem, Henry Ibstedt reported *(November '96)* finding one with three of p, q, r, s, t sharing one factor and the other two sharing a different factor. This solution is p=286, q=154 sharing the factor 2, and r=s=t=11 sharing the factor 11 with (2, 11) = 1.

Henry points out that p and q also share the factor 11 but that this was not excluded from the question — there is still a great deal of work to be done before this problem is fully understood.

Questions

- Do all numbers occur in this sequence, and also, do they occur an infinite number of times?
- Is there always a value of n, for every a (positive or negative) so that X(n)+a = X(n+1)?
- Is there a way of predicting when a number will occur in the sequence?
- Is there a formula which gives the n'th value of the sequence, without calculating the rest of the series?
- What happens for other sequences, such as x(n)=ax(n-1)+b mod n or x(n)=(x(n-1) +x(n-2)) mod n?

Something different

This item was taken from *Computer Weekly* (19th January edition, 1989).

Following up on the observation that $15226_{10} = 62251_7$ and further that $99481_{10} = 18499_{16}$ (where the subscript denotes the base in which the number is represented), find the lowest five-digit number (in any base). Generalise this process to n-digit integers.

Answering back…

Please send any investigations of the above problems to Mike Mudge at 22 Gors Fach, Pwll-Trap, St Clears, Carmarthenshire, SA33 4AQ (tel 01994 231121), to arrive by 1st July, 1997. All material received will be judged according to suitable criteria and a prize will be awarded by *PCW* to the best entry arriving by the closing date (an SAE is required for the return of entries). Each contribution should contain brief descriptions of the hardware and coding used, together with run times and a summary of the results obtained.

General comments on the topic of JAMS would be welcome, together with any practical (or unusual) applications of integer arithmetic in number bases other than 2 and 10.

PCW Contact

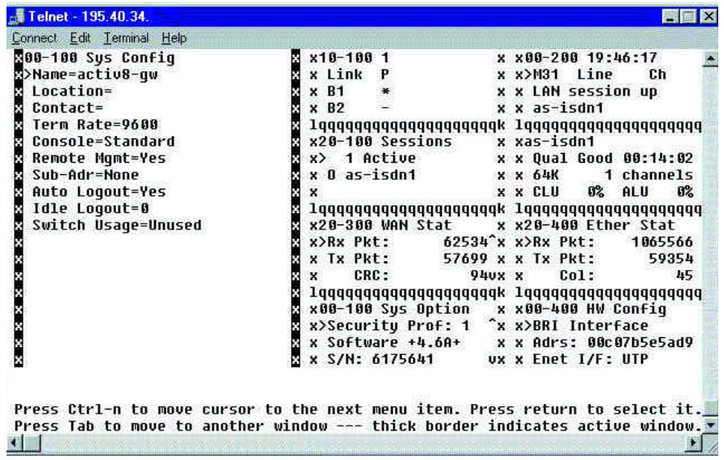
Mike Mudge welcomes correspondence from readers on any subject within the areas of number theory and computational maths, together with suggested subject areas or specific problems for future articles. Email numbers@pcw.vnu.co.uk

Fraught in the net

Getting connected to the internet can be a risky and potentially expensive business. Roger Gann takes the worry out of it with a back-to-basics brief on what's what and where to get it.

I guess a reasonably high proportion of *Personal Computer World* readers regularly access the internet from their PCs at home, using a V.34 modem and a normal phone line. Such an act would have been rocket science a few short years ago, but today it's a routine event. For single users, this method, a modem plus a conventional phone line, is the most cost-effective internet access solution. But what if you wanted to give internet access to a group of users, say those on a small network? Well, there's absolutely nothing to stop you from scaling up the single-user solution and applying it to everyone on the network, buying them all a modem, giving them all a phone line and their own ISP account. It's feasible, but it's a less than desirable solution. Not only would it be a nightmare to configure and administer, but it would also be expensive to implement.

No, a much more elegant solution is to integrate internet access into your network. The good news is that, depending on your precise needs, you may not have to fork out for expensive new kit in order to do this. In fact, for most companies the expense will be relatively trivial. There are basically two choices available: email-only or full-blown internet connectivity.



Complicated or what? You can telnet in to your ISDN router once it's been configured, but as you can see, configuration isn't straightforward

Email only

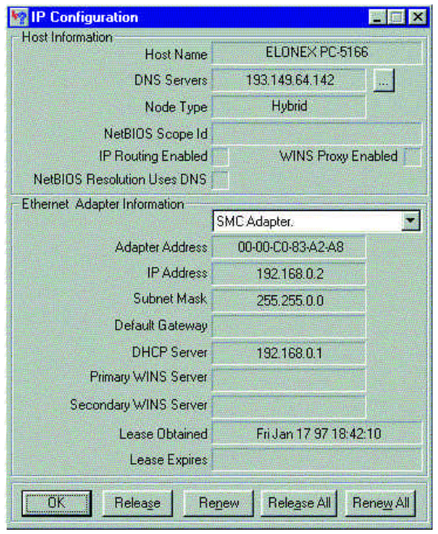
I suspect most companies, even small ones, running even modest networks, rapidly appreciate the benefits of email, often provided as a standard feature in their NOS (e.g. Windows 95 or Windows for Workgroups 3.11) and soon find themselves making heavy use of internal email. So it makes a lot of sense to consider extending the existing email connectivity to embrace the internet — sending an email is probably the cheapest method of global communication available.

For email purposes you don't need instant or continuous access to the internet, nor do you need a particularly fast connection: emails tend to be reasonably compact and the throughput offered by a 33.6Kbps modem will be perfectly adequate for most email traffic. However, if you get much email with large attachments, a faster connection is maybe worth considering. So, your hardware costs will be negligible. You'll also need a mail system that supports internet mail. A good, ubiquitous example of such a system is good old MS Mail, which offers basic email services and is supplied free with both Windows 95 and Windows 3.1x. It's possible to configure MS Mail to initiate a connection to your internet service provider via the modem at regular intervals, say every hour or so, to deliver new outgoing emails and to receive new incoming messages. To do this you simply add the optional "Internet Mail" service to the Exchange Inbox client in Windows 95.

Such a setup is just dandy for standalone machines collecting their own personal email but it can't handle multiple internet email addresses on the network. What MS Mail needs is a bolt-on external mail package, one that can cope with POP3 (Post Office Protocol 3) and SMTP (Simple Mail Transport Protocol) mail systems offered by most ISPs. With such an add-on, every time MS Mail connects with the ISP's mail server, it downloads everybody's mail in one lump and then sorts it, placing the appropriate messages in the appropriate mailboxes. The result is transparency between internal and external email.

There are a number of these add-ons on the market. The European Microsoft Windows NT Academic Centre (EMWAC) based at Edinburgh University has developed EMWAC Internet Mail Services for Windows NT (along with a whole slew of other useful internet goodies). IMS is a suite of server programs which lets you use Windows NT as a mail server for internet mail. IMS isn't perfect — it requires Windows NT, of course, and can be a bit daunting to set up, but it does have the redeeming feature of being freeware. All the EMWAC goodies can be found at emwac.ed.ac.uk/.

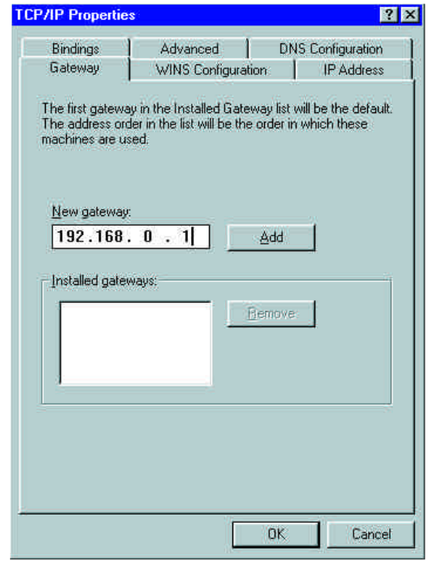
Another alternative worth investigating is SLMail, developed on Bill's doorstep by Seattle Labs. This is available for all the Windows platforms, and a Windows 95 version (limited to six accounts) is available free from www.seattlelab.com/ (and is also on this month's cover CD). Like IMS, SLMail95 offers a complete implementation of the Internet SMTP and POP3. With SLMail installed, your PC can function as a post office for popular internet mail clients such as FreeAgent, Pegasus, Eudora, Navigator and MS Mail/Exchange (with the Internet Mail add-on). The full-blown Windows 95 version costs $189: the Windows NT version costs $325. So, the software cost needn't be great either.



This undocumented goodie is supplied with Win95 and displays your PC's IP configuration, useful if you use DHCP on the server to allocate IP addresses

So we've now got our internet mail software in place but there's still one variable to determine — does your existing email account with your internet service provider permit multiple email addresses? The type of email account varies from ISP to ISP. Some, for example, allow up to 99 mailboxes from the one common-or-garden "tenner a month" account. This is certainly a cheap and cheerful solution but the principal drawback is cosmetic, the lack of a personalised email address — it would be, say, rgann@company.demon.co.uk rather than the more impressive rgann@company.co.uk. Private domains cost extra of course, and you'll have to talk to your service provider about what types of account it has on offer and proceed from there.

In terms of hardware configuration, a network email system will be similar to a normal standalone internet connection: you'll just need a phone line and a fast modem. Commissioning the connection would be much the same too. Note that as only the server accesses the internet, it will be the only machine on the network that needs to run TCP/IP. The workstations would continue to collect their email in the usual way, via NetBEUI or IPX. This makes life much easier for the network administrator and also prevents the workstations from accessing the internet during connections.



The ISDN router now becomes your gateway to the internet — so don't forget to add the IP address of the router to the Gateway tab of TCP/IP properties

Full internet connectivity

In some ways granting complete internet access to the network isn't much more complicated than setting up global email. Just two extra things are required — an IP address for each workstation (which will almost certainly require a "corporate"-style access account with your ISP) and rapid access to the internet. A permanent leased-line connection offers instant connection while a V.34 modem takes about 20 seconds to connect. The former is expensive and fast; the latter is cheap and slow. A popular compromise solution is offered by ISDN which offers the best of both worlds — a fast 64Kbps service (with the possibility of 128Kbps) with the economy of demand dialling, plus fast connections, typically just a few seconds, certainly a lot faster than the time taken by your browser to load! For occasional internet traffic, ISDN is very cost effective, offering the speed of conventional leased lines at a fraction of the cost. However, once you spend more than about four hours per day online, a leased line becomes viable.

You would use an ISDN terminal adaptor or TA to connect a single PC to an ISDN but for networks you'd fit a single ISDN router instead. This device sits anywhere on the network, watching the TCP/IP traffic that

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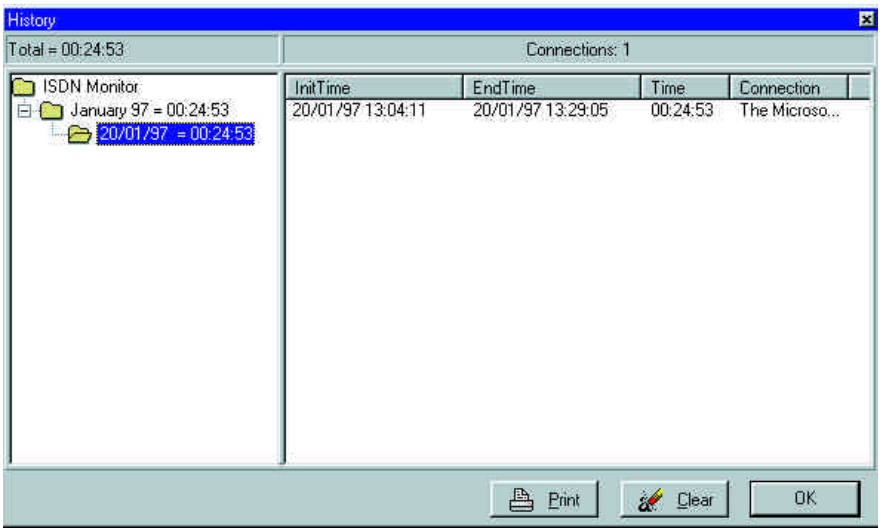
Router alternative

Installing TCP/IP on a lot of workstations is enough to make a network administrator cry. Luckily, Bay Networks has an alternative internet access solution for those wedded to the NetWare standard. Instant Internet 3.1 is an IP/IPX gateway server package, a hardware/software combination that allows NetWare users to access the internet without having to worry about configuring TCP/IP on top of an IPX stack. It effectively permits workstations to access the internet using just the NetWare IPX stack — only the Instant Internet server uses TCP/IP. The downside is that it's not particularly cheap — a 50 concurrent user ISDN version is priced at £4,329 and it can be awkward to configure. www.baynetworks.com/



Keeping a tight control on ISDN line charges is crucial. This little utility, ISDN Monitor, specifcally monitors ISDN usage. It's on the cover disk!

passes by. It ignores traffic destined for IP addresses on the internal network but as soon as it detects a network packet aimed at an external internet address, it initiates a call to the ISP and sets up an internet connection. The line is dropped when the connection is no longer required or times out after a specified period of inactivity.

Users are spoiled for choice when it comes to ISDN routers, although you shouldn't necessarily buy the cheapest. Prices vary from about £750 to £1,500, which may sound dear but don't forget to divide the price by the number of users to get the cost into perspective. How do you go about choosing these exotic bits of kit?

ISP at your service

A good place to start is your local friendly internet service provider — what routers do they recommend or support? For example, many ISPs use Ascend routers at their end and so to simplify things they naturally recommend that you use something like an Ascend Pipeline 25 or 50 at yours. However, there are other equally good if not better alternatives, for example the £1,415 Gandalf XpressConnect LANLine 5250I or the excellent £750 Shiva AccessPort. If at all possible choose one that has an analogue phone socket (or two) — this lets you use the ISDN line as a normal phone line for fax machines or ordinary modems, for example.

Connecting an ISDN router to the network is the easy bit: you just plug the ISDN lead into the ISDN phone socket and plug in the network cable. Beware — this is usually a 10Base-T RJ45 which is the same as the ISDN (or "WAN" socket), so don't get these two mixed up. Routers tend to be disarmingly small boxes, no larger than a modem, and so can often be tucked away in a comms cabinet or next to the server.

Configuring an ISDN router is a different matter and can be a particularly daunting task. They come with a range of tweakable settings wide enough to make any network techie jump for joy. However, if you've cut your internet teeth by manually setting up a connection using, say, Windows 95 Dial-Up Networking, you'll already be halfway up the learning curve. Even communicating with the router can be painful. Once configured, most routers let you telnet in to them for management and configuration tasks, but not usually the first time around.

Most routers therefore typically feature a serial port which lets you hook up a dumb terminal or a PC running a terminal program which lets you access the router's text-based configuration menu. One router I installed wouldn't even talk to good old Windows Terminal: I had to download ye olde Procomm Plus for DOS, circa 1987AD, before it could be configured. Luckily, some routers are a bit easier to configure — the Digi Retoura ST has an LCD control panel and keypad for direct configuration, while the latest Ascend Pipelines have Java applet-based configuration firmware, making them configurable from a browser. Most user-friendly of all is probably the Windows-based Shiva Monitor software supplied with the AccessPort.

Once connected to your router you'll need to enter such crucial details as the ISDN number it has to dial, the IP address of the router or gateway at the other end, the IP address of this router, the DNS IP address, logins, passwords and security levels. This is just a basic list of data you can enter; more sophisticated users will want to configure things like the PAP and CHAP security protocols, data compression and bandwidth on demand.

Checking that the installation works is fairly straightforward and most include comprehensive diagnostics in the firmware as standard. Once the installation has passed this test you can use conventional internet tools, such as ping or even a web browser, to make sure that calls are being initiated and terminated as required.

The final step is to roll out TCP/IP to the workstations, a relatively easy task if you're using Windows 95, less so if you're still using Windows 3.1x. Your internet service provider will have allocated you a range of IP addresses, say 192.168.0.1 to 192.168.0.25, and you then manually dole out one of these IP addresses to each workstation. This tedious chore can be greatly simplified if you're running Windows NT on the server, as you can install the DHCP (Dynamic Host Configuration Protocol) service. This lets you define a pool of IP addresses that are then dynamically allocated to each workstation as they log on to the network. So instead of specifying a "static" IP address for each workstation, you'd obtain the IP address automatically from the server.

Silence is expensive

A final word of warning: ISDN is completely different to the usual PSTN phone system we hook our modem up to, and it's easy to rack up excessive ISDN phone bills unless you keep a close eye on it. The main problem is ISDN's inscrutable "silence": the absence of the usual audible clues such as dial tones and negotiation whistles and noise means you're entirely dependent on software to tell you if the line is up and data is flowing correctly, which is a scary prospect. If you don't want phone bills that resemble telephone numbers (ho-ho, weak joke) it's essential to get BT to supply you with completely itemised bills for your ISDN line so you can see exactly what your router gets up to when you're not looking.

PCW Contact

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World in motion

It's a funny old world — or at least, it looks very different in 3D than the picture-book 2D views we're familiar with. Benjamin Woolley sets his sights on a more accurate projection.

The picture we have of the world is one that is fundamentally distorted because it is a two-dimensional version of a three-dimensional surface. If you look, for example, at the standard map of the world, the so-called "Mercator Projection", China appears to be roughly the same size as Greenland when in fact it is four times larger. This distortion occurs because the land nearer the poles is stretched out to the width of the equator (to form the rectangular shape of the map), so countries on the equator appear narrower than they should when compared to those closer to the poles. You can see how this happens in Figs 1 & 2. Fig 1 shows a map of the world. Note how huge Greenland is compared to China. Fig 2 shows the same map wrapped round a sphere, with Greenland now assuming its proper proportions. (I created the globe using Fractal Design's new Detailer package, of which more later.)

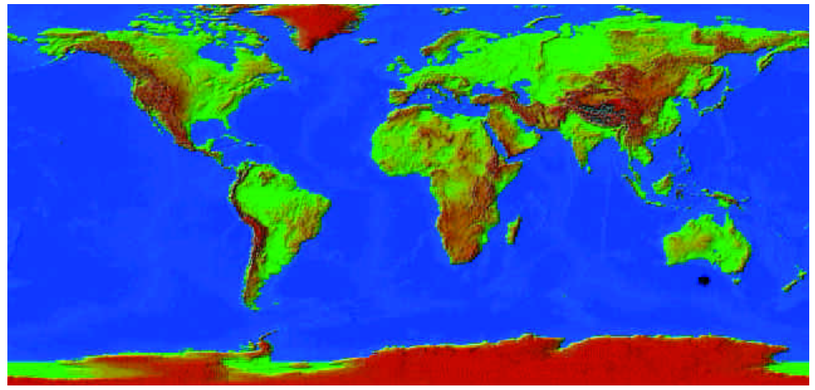

Fig 1 A texture map of the world. Note Greenland's size relative to China

There have been various attempts to produce more accurate projections (one of the best is said to be the Peters Projection, which makes Africa and other equatorial landmasses look huge, and more polar places, like our sceptred isle, teeny — you can have a look for yourself by browsing www.webcom.com/~bright/table.html), but none of them can be perfect. In the transition from 3D to 2D, something has to go, and in this case it is the true size and shape of each country.

As I have discovered from my email inbox, such problems are not confined to geography. A number of people have described the problems they have encountered trying get their texture maps to work, so I thought this month I would concentrate on this most perplexing area of 3D artistry, and at one tool that claims to make it easier.

Generally speaking, when you are trying to create a 3D scene, the sort of project you are dealing with is the reverse of Mercator's: you are trying to turn a 2D image into a 3D one, to take your flat map and wrap it round a sphere or, more usually, an irregular, complex shape. If you take another look at Fig 2, you can see quite clearly one of the first problems you encounter when trying to do this. Greenland's shoreline is slightly fuzzy, and there are two reasons for this. The first has to do with the size of the map: it has fewer pixels in it than there are on the surface of the object as seen from this perspective and at this size. You encounter this problem regularly, most obviously when the 2D bitmap, the texture, is placed on a wall or floor receding into the distance. As you can see in Fig 3, the bitmap is blurry at the point where the wall comes closest to the point of view. The solution to this problem is to match the texture's resolution to the wall's at the point closest to the camera. This means actually working out how many pixels there are down the edge of the wall, and making the appropriate edge of the bitmap the same number of pixels in size (in this case the bitmap is tiled, so I can divide the number of pixels in the rendered scene by the number of repetitions of the texture across the height of the wall).

The second reason for Greenland's blurriness is that where the map is approaching the poles, it is getting progressively scrunched up. There is no way of completely overcoming this problem unless you somehow manage to create a bitmap with progressively lower resolution towards the top and the bottom of the image. As far as I know, no image file format supports such variable resolution.

How, then, can you keep such distractions — "artefacts", as they are called in the business — to a minimum? By getting a grip on the way your 3D package projects or "maps" the texture onto the object. In all 3D packages there are basically three ways of mapping, usually known as spherical, planar and cylindrical. Spherical mapping is the sort demonstrated with the map of the world. Planar projects the texture onto the object as a film image is projected onto a screen. Cylindrical winds the image around an object like a label round a tin of beans. You can generally use these methods to texture simple objects: a vase, for example, can be textured using cylindrical mapping, especially if you use a paint program to stretch and contract the image to correspond with the vase's curves. However, some objects are just too complex to be textured using projected mapping, which means having to resort to a fourth method, surface mapping. A surface map is generated when the object is actually constructed, and if you think of the object as having a skin, the shape of the map is the shape of that skin carefully peeled off and laid flat.

If you are having problems getting a surface map to work, a weirdly distributed surface map could well be the cause. One way of solving it is to create a texture covered with a grid, using a gradation of colours so you can distinguish the position of the lines. Apply this grid as a surface-mapped texture to the object and see if that throws any light on how the map is arranged. Another easier solution is, of course, being able to paint and stick textures directly onto the surface of objects without bothering about technicalities like mapping co-ordinates. Which brings me on to Fractal Design's Detailer.

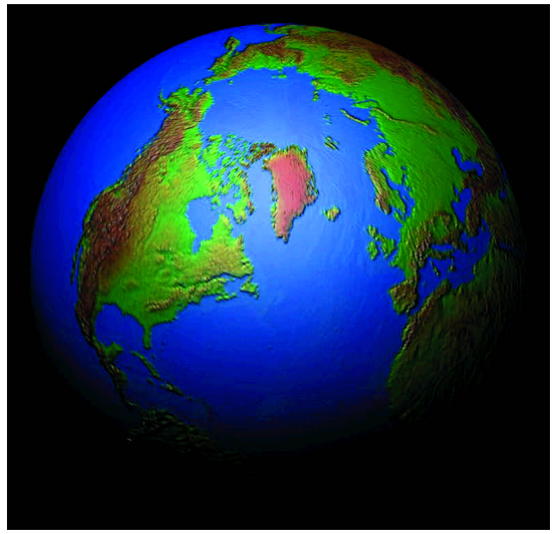

Fig 2 The texture map in Fig 1 wrapped round a sphere. Greenland assumes its proper proportions

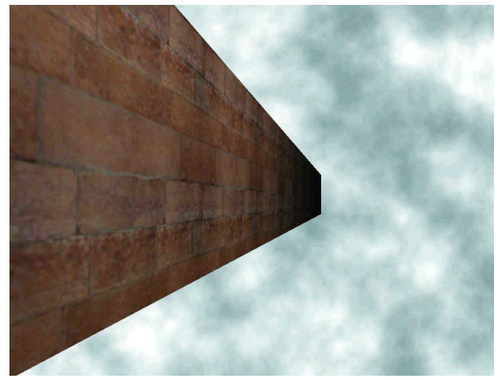

Fig 3 The purpose of this rather surreal image is to show a texture map being stretched beyond its resolution. Note the blurring where the wall is closest to our point of view

Detailer

When I first read the blurb about Detailer, I could barely believe it. "Amazing 3D Paint Program" proclaimed the press release. "A stunning new graphics application that allows users to paint on the surface of 3D models in real time." This could be the answer to all my prayers, I thought; 3D painting on the PC platform.

After spending a few weeks with Detailer, I have to say that it only partially lives up to its promise. It *can* work in real time, but most PCs will be stretched to the limit to keep up. And the design is fussy, introducing a whole new set of terms and concepts to a field already overburdened with both. However, I should point out that even if it is not quite 3D painting in the full-blown sense, it does offer one crucial new capability: it brings 2D and 3D together.

Generally, when I am working with textures, I have a paint package like Photoshop and a 3D package open on the system simultaneously. I edit the image, save it, load it into the 3D package's texture editor, apply it and then render the object to see what has happened. When, as is inevitably the case, I find the texture is too big, too small, too bright, too dark, too whatever, I have to start again. With Detailer, these two functions are combined. You have one window showing the 3D model being textured, another showing the 2D texture. When you change the texture, you see the result immediately in the model window. And there is another facility that helps deal with the surface mapping problem: being able to overlay a "mesh" that shows in 2D the surface ("implicit" in Detailer parlance) map of the object being worked upon — the skin, if you will. You can then paint over the mesh, building up a texture that maps directly onto the surface of the object.

Fractal Design is an interesting and increasingly influential company in the graphics field. Painter 4, Ray Dream Designer, Poseur, and now Expression (my favourite: a program that allows you to use drawing tools to paint) make up a more than adequate toolkit for the budding computer graphics artist. Detailer will be a perfect complement to this developing suite once certain shortcomings are dealt with: when there is some sort of mechanism for importing surface/implicit mappings or, even better, deriving them from the geometry; when the interface and jargon is simplified; when you can export the flattened-out meshes of objects with implicit mapping so you can use more sophisticated 2D packages to paint over them. I hope this is not unreasonable. I only suggest it because Detailer so tantalisingly holds out the prospect of making texturing a simple, even intuitive process.

PCW Contact

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Retouch and go

Gordon Laing shows how to save what might have been the perfect photo, ruined by blots on the landscape: don't bin it, scan it, and use every trick in the book to total unwanted tourists.

This month, I finally get to bore you with my holiday snaps, thinly disguised as a feature on the tricks and morals of photo-retouching.

But first, the news. Intel's Pentiums with MMX enhancements have finally been announced, so in last month's *PCW* we tested eight MMX PCs. We tried out Adobe Photoshop 4 and CorelDraw 7, both featuring MMX code, on a Pentium 200MHz with MMX. We timed filters, image rotations and colour-mode changes under Photoshop and a screen redraw of Corel's Snowbarn file at a resolution of 1024 x 768 in 16-bit colour. We then swapped the MMX chip for a standard 200MHz Pentium without MMX, and repeated the tests.

The Photoshop results showed speed increases of up to 45 percent, but Corel's faster redraw was thanks mostly to MMX's doubled Level-1 cache. Slightly disappointed, we later discovered that the graphics-card drivers will have to be updated to make use of MMX chips, and only then will we see redraw improvements.

Those wanting a top-of-the-range PC today, particularly for multimedia applications, should go for an MMX model. But the rest of us should be content to wait until we're running mostly 32-bit apps under NT4, then make the more significant upgrade to a Pentium Pro chip — soon to be seen with MMX enhancements too.

Anyone seeking a major hardware upgrade for graphics work should still consider more RAM before plumping for a faster chip. The photo-retouching I describe here involved working on 28Mb files, using a PC fitted with 32Mb. By the time Windows 95 and Photoshop had their share, the system almost ground to a halt. After one very slow day, I took 32Mb of RAM from my home PC to boost my work PC to 64Mb. The difference was amazing, with operations taking mere seconds rather than minutes.

As my main subject this month involves photography, this is a good time to mention digital cameras. Users of Casio's popular, but slightly toy-like, QV-10a and QV-100 cameras may be interested in considering third-party lenses. The Kerridge Computer Company offers a kit for either camera, featuring a 1.5X telephoto and 0.65X wide-angle lens for £64 (plus VAT). A 2X and 4X macro lens kit is also available for the QV-10a at £64 (plus VAT), while a 2X-only macro lens for the QV-100 costs £49.50 (plus VAT).

Kerridge also offers a lighted base and stand, to photograph transparencies with the aid of the optional macro lens. We haven't yet had the opportunity to test these products but those still making their choice of digital camera could do worse than opt for Sony's new DSC-F1, reviewed in this month's First Impressions *(page 70)*. It's a 640 x 480 pixel model with flash, LCD display, infra-red port and the kind of sexy styling at which Sony excels, for £595 (plus VAT).

The morals of manipulation

When I was 14, I stopped mucking around and started taking serious photos. I remember recoiling in horror when I first saw one of my photo pals use a filter: rendering the sky that graduated shade of tobacco so popular in those days. But now, his picture would be inaccurate! The event had not been recorded properly and anyone looking at the picture would be falling for a lie!

Suffice it to say, this extreme response disappeared as soon as I had a go myself. Suddenly, photography had become much more than just finding something nice-looking, pointing the camera at it and clicking. It had finally dawned on me, the number of ways in which a photographer could manipulate a picture without even changing position or lenses. More to the point, it became much more fun.

Later, I found myself spending much longer in the darkroom than outside taking the pictures. Dodging and burning to bring out otherwise hidden details became an obsession. As regular readers will know, my darkroom now resides within my PC and applications like Photoshop, but the principles, goals and morals still remain.

A touch of professionalism

Digitally painting out dirt and scratches can be seen by all as beneficial. You can selectively darken, lighten or even recolour areas of a picture, even though some may consider this to be cheating a bit. Take a one-off trip to a far-off land, for instance: an otherwise perfect photo could have been marred by an overcast sky. Many would consider themselves fairly beaten. But while there's nothing better than capturing the perfect shot, first time, there's still no need to bin a less-than-ideal pic. Why not scan it in and add a blue sky? Or at least darken the area to bring out more detail in the highlights? You may at first share the same horror I experienced when witnessing my first filter, but if you can get over this you'll never look back (the professionals use every trick in the book until they get the picture they want).

This neatly brings me to the biggest graphics job I've ever completed: printing a collection of holiday photos taken during the past two years. Wanting the very best final results, I chose to use professional slide film: Fuji Velvia (50 ASA) and Fuji Provia (100 ASA). Choosing slide film, however, proved to be a bit of a mistake since the 10in x 8in prints I desired were going to cost over £10-a-go at professional labs. Besides, I had originally wanted 12in x 8in prints to show the full 35mm frame, but these had been even more expensive. Consequently, the processed slides just sat there in their sleeves… until now. Towards the end of last year I decided to use my PC to scan the films and print them out the next time I got my hands on a decent colour printer. At the same time I could make any digital enhancements I desired.

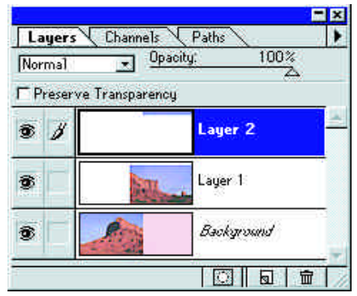
Admittedly, I'm still not keen on the idea of selecting an overcast sky and replacing it with deep blue (the guilt still twinges, deep down). Nevertheless, I suddenly found myself to be not so bothered about man-made aberrations in my otherwise perfect field of view: those horrible signposts, telephone wires, fences, tracks, or even stray holidaymakers, could be easily wiped out using my PC.

Look — can you see the join?

Of course, you should still try to make life easy for yourself by trying to line up your shot to minimise the amount of post-processing work required. For instance, I once came across an extremely long fence crossing my entire field of view; I couldn't climb it, so instead I walked right up to it and pointed the camera along it. There's still a nasty fence to get rid of, but rather than crossing my entire frame, it only measures a couple of millimetres wide.

I also saw opportunities to digitally join two photos to produce a panoramic shot. Here, the usual tips apply; try to use a tripod, or lean on a fence to make sure the shots line up vertically. In one case I had to make do without a support and discovered later, at the joining stage, that the shots were about ten percent off so one of them needed an extra portion of sky. But after a little copying, pasting and smudging between the joins, I am pleased with the results I achieved.

Incidentally, there is an excellent tutorial on the CD that comes with Photoshop 4, which shows how to create a complex



Far left Utah's Monument Valley is just begging for a panoramic shot. I took two photos with my 35mm camera and stuck them together using layers in Photoshop 4 (above)

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Clockwise, from top left: Central Park with a lampost, then without. My terrifyingly white legs… but hey, who are those two blokes by the rock? I'll get rid of them! Monument Valley by moonlight and a cunning car headlight trail; but perhaps it looks better without? A tranquil Californian beach scene… but hang on, spot that fella with the rucksack? He's history! All the above retouching was easily done with Adobe Photoshop's clone tool

panoramic shot, taking multiple frames and foreground parallax into account.

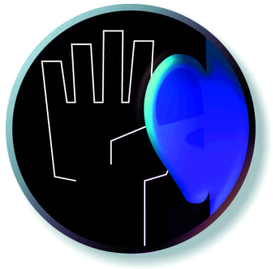
Before letting my photos and their captions do the talking, a short word on the PC hardware employed. I needed an excellent 35mm film scanner and was not let down by the superb Nikon Super CoolScan, a 2700dpi 36-bit model which quickly produced 28Mb (maximum) files. This was connected to an Adaptec 2940UW SCSI card, which also controlled a secondary 2Gb Quantum SCSI hard disk.

The 166MHz Pentium PC I described earlier was fitted with 64Mb RAM. I used Photoshop 4 under Windows 95 and, to maximise performance, set Windows virtual memory to 2.5 times the amount of RAM for both minimum and maximum quantities, thus preventing Windows wasting time resizing its swap file. I also set Photoshop's scratch disk to the physically separate Quantum hard drive, independent from the drive that Windows was using for its own virtual memory. I can't wait to go away on holiday again!

PCW Contacts

Any questions? Write to me at the usual *PCW* address or email me at graphics@pcw.vnu.co.uk

Kerridge Computer Company 01635 523456
FontWorks 0171 490 5390
Sony IT group 0181 760 0500



Generation X

Koan Pro, which randomly generates musical ideas, is now in Silver, Gold and Platinum formats and active on the internet. Steven Helstrip tuned in and turned on to its ambience.

From the letters and email I receive, it has become apparent that the occasional hardware review would be appreciated on these pages. So from on, I'll be on the look-out for new and appealing products to put to the test.

For this issue, I got my hands on the stunning ZA2 digital audio card from Zefiro Acoustics, which you, too, can lust after once you've checked it out. We also have news of an emerging audio standard for the internet, some useful MIDI tricks, the customary sampling CD review and a stack of goodies to enjoy on this month's CD.

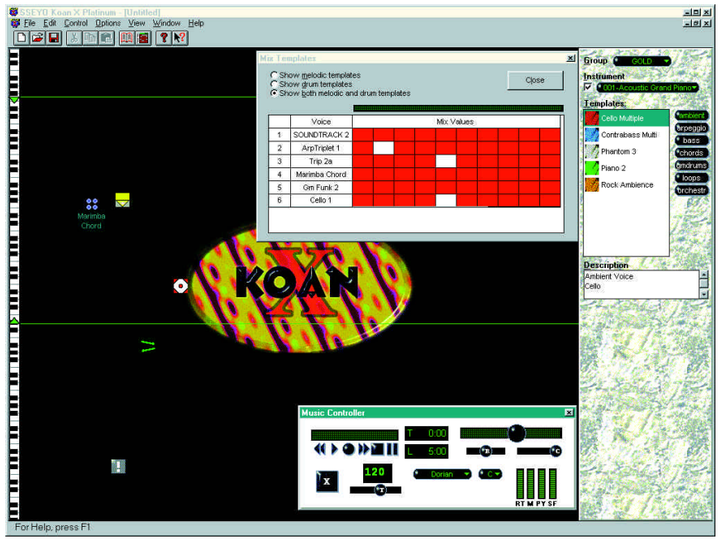


Fig 1 Koan X Platinum: Create "ever-changing" music easily by dragging pre-recorded phrases, or templates, into the mix window. Templates exist for most styles of music, from ambient through to techno. By applying rules to the templates, your music can take on a life of its own...

Koan Pro

Last year I met up with Brian Eno to see how he was using Koan Pro to write generative, ambient music. Koan, which I wrote about in March 1996, randomly generates and develops musical ideas for up to nine hours at a time, and all from a modest 100Kb file. Eno later released an album of "Koan" music. It wasn't available on CD, however. It came on a floppy disk.

On the disk was a jukebox-style utility and enough music to last the weekend. Using only an AWE-32 as the sound source, there was only so much you could expect, but the music was interesting enough owing to the random nature of the Koan engine: each time a track was played, it would develop differently. In fact, you would never hear the same piece of music played twice.

Twelve months on, Koan has been adopted as a new, low-bandwidth music format for the internet. To help the format along, a new application has been developed to allow even the most modest of musicians to create generative music.

The new software, Koan X, comes in three flavours: Silver, Gold and Platinum. The Silver edition can be obtained as a free download from the sseyo web page and comes with 30 musical templates to be used as starting points for your arrangements. Although it's a radically cut-down version, it can be used to produce up to two minutes of music — ideal for creating free music for web sites. Gold provides 30 further templates, General MIDI and Soundfont support, and better editing facilities. It will generate up to eight hours of music. The Platinum version, shown in Fig 1, has it all: 100 templates, automated muting/mixing, and the ability to output songs to either MIDI or wav files.

You can find a copy of the Koan X Silver on this month's CD. Gold and Platinum versions are available from sseyo's website, www.sseyo.com, via secure credit-card transaction, priced £15.99 and £32.99 respectively.

Trigger happy

The only good to come out of studio noise was the invention of the gate. This is a hardware device, usually rackmounted, that turns the input signal from a noisy keyboard, say, to either on or off. When closed, no sound can pass through, reducing cumulative noise. When triggered by an audio signal, the gate reopens.

A neat feature found on some gates is

Fig 2 A typical gating rhythm, two semi-quavers followed by a quaver, seen as note lengths

the ability to open the gate from an external trigger, enabling you to create rhythmic patterns from any sound. This is a prominent feature in today's dance music, used frequently with synth pads and vocals. When a sustained chord is routed through a gate, a sound source from a second keyboard can be used as the gate trigger. By playing or sequencing a pattern on the trigger, some great effects can be created.

It is possible, using MIDI volume messages, to create a similar effect, although it cannot cure any problems you have with noise. A typical rhythm used for gating is two semi-quavers followed by a quaver, repeated over and over. This can be seen in Fig 2 as note lengths. Be aware, however, that note lengths should be reduced by 50 percent, to allow the gate time to open and close. If they are legato, the gate will remain open.

■ Newtronic gates

Newtronic has produced a compilation of 100 MIDI gating effects, along with panning and volume fade effects, available on floppy for £14.95 (Fig 3). The disc contains some excellent syncopated rhythms which are superb to have at hand. To use them, you import the MIDI file to your sequence and set the MIDI channel to where you want the effect. The panning effects, likewise, are not to difficult to program, but save you time and aggro.

Zefiro Acoustic ZA2

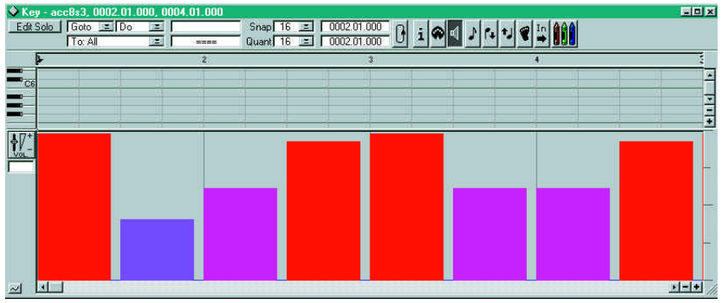
To record audio to your PC without adding noise in mountain-sized proportions, the analogue to digital conversion must be performed by an external ADC, such as a DAT player. The ADCs found on sound cards just aren't up to the job, and even if they were, they would be subject to interference from the myriad goings-on inside your PC.

The Zefiro Acoustics ZA2 is a new DSP-based digital audio card designed to work alongside any digital source, be it a sampler, DAT machine or another hard-disk recording system. The single 16-bit ISA card provides SPDIF, Toslink fibre-optic and AES/EBU digital in/out as standard, and is supplied with DSP utilities to support 20-bit recording and MPEG2 playback. Providing your PC has two high DMA channels available, the ZA2 will work in duplex mode and has no problem handling as many audio tracks that your PC can throw at it.

Installing the card was straightforward, even with two other sound cards present. The accompanying driver software, seen in Fig 4 *(page 306)*, can be accessed effortlessly from the Task Bar: such a simple idea and it works a treat. The icon also indicates whether or not the card is synced to an incoming digital clock.

All digital outs on the ZA2 function simultaneously: inputs are software selectable. There's also an analogue output for monitoring. With some help from the DSP, the ZA2 will up or down sample data, enabling real-time sample conversion. For example, you can feed a 48kHz DAT stream to the card, but actually record at 44.1kHz. Likewise, you can play a mono, 11kHz, 8-bit sample from disc and output to DAT at the

Fig 3 Newtronic's collection of MIDI gating effects will help you get the rhythm right



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Creative Essentials' World Class Breaks

World Class Breaks is the fifteenth CD to be released under the Creative Essentials label. Like the rest in the series, a mere 20 quid buys you 200 samples, in this case drum loops in both audio and 16-bit sample format for Windows and Mac systems. Ten genres of dance music have been covered: hip hop, swing, acid jazz, house, garage, and jungle are among them.

For each of the ten styles there are twenty loops. These are essentially four grooves, with five variations on each, but this is no bad thing since it enables you to vary the drum patterns throughout your songs. Each of the four grooves within each style are tempo-grouped with 5bpm intervals.

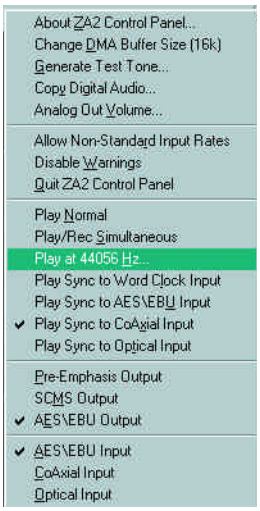
John Dunne, the producer, seems to have hit the nail on the head with the swing, acid jazz and seventies funk patterns, but seems to have lost the plot with the house and garage patterns, which lack imagination and are stale in comparison.

Taking the overall package into account, though, this is still a great CD at a great price. The samples used to create the loops would have been appreciated, but isn't that the usual story?

There are five loops on this month's cover CD in the hands\sound folder. Have fun!

standard 44.1kHz 16-bit stereo.

The ZA2's OS is downloaded to the card at system boot, allowing the card to be upgraded with new software which will be made available on the net free of charge. DSP algorithms are also in development, making real-time effects such as EQ and reverb possible in the near future. Hard-disk backup software is supplied with the card, enabling 1.2Gb to be stored on a standard two-hour DAT.



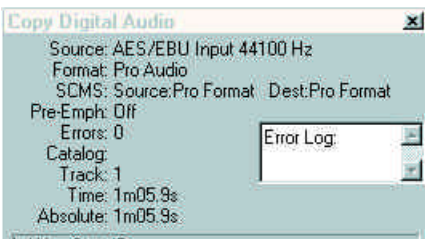


Fig 4 The driver software which accompanies the Zefiro Acoustic ZA2

I've had two weeks to check this card out, and it's been a joy. I no longer need a digital patch bay, since I have had the DAT plumbed-in on the AES/EBU and the sampler on SP/DIF. I'm assured that multiple cards work together with Samplitude and SAW to provide up to six independent outs, although I don't suppose Zefiro would let me have another two cards to check it out...

Zefiro Acoustics has succeeded in putting together a truly versatile and future-proofed card at a superb price. It could show the CardD a thing or two.

PCW Contacts

If you have any hints or tips, MIDI-related items or general comments, contact **Steven Helstrip** at the usual *PCW* address or email him at sound@pcw.vnu.co.uk

Newtronic 0181 691 1087
World Class Breaks £19.95 (inc. VAT and delivery) from Time + Space 01442 870681
Zefiro Acoustics ZA2 £397 (inc. VAT) from RKMS 0115 961 1398; www.rkms.com

Clean-up campaign

Tim Anderson wrestles with the registry in an attempt to unscramble his settings, tries to get Access from Delphi, and plays Sherlock Holmes to detect which applications he has running.

Imagine you have paid a four-figure sum for a top-of-the-range client-server development system. One day you open up the development environment and the splash screen declares it to be the entry-level hobbyist version. Next, you open the application you are working on to be informed that you are not licensed to use some of its components. Sighing, you reinstall the product from CD but it does not fix the problem.

Sounds fun? This is exactly what can happen with Visual Basic 4.0. The reason, as you will have guessed, is that both VB itself and the many OCX controls which come with it depend on numerous registry settings. If the registry gets scrambled, this is the kind of thing that can happen.

The good news is that Microsoft's web site has a fix. Article Q149619 is entitled "Visual Basic displays incorrect splash screen", although the splash screen is the least of your problems. It is not such good news though. The official fix goes as follows:

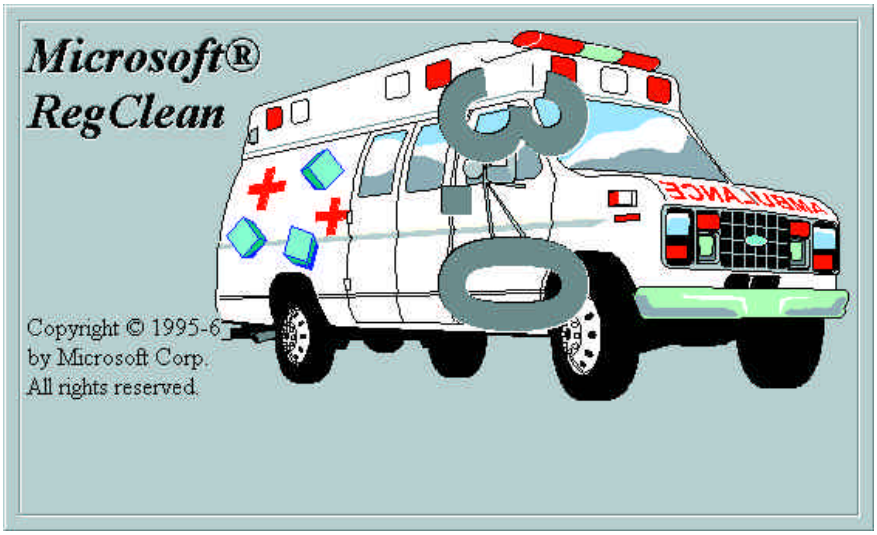
1. Using a registry editor, delete the HKEY_CLASSES_ROOT\LICENSES key.
2. Run Regclean.exe and delete all *.OCX and *.OCA files.
3. Delete OLEPRO32.DLL.
4. Restart Windows and reinstall Visual Basic.

Is this a good fix? Well, it's better than destroying your hard disk with a sledgehammer, but not much. As a developer, you will know that those .OCX and .OCA files represent most of the ActiveX controls on your system. An OCA file, by the way, is an OLE-type library created by VB when you first load an OCX. And ActiveX, says Microsoft, is becoming the foundation of Windows. Then there is the license key to think about, which any number of applications may be using. A clue to the extent of this devastation is given in the note at the end of the fix. "Reinstall third party custom controls," it says, "and any software that may use the registry to store licensing information."

As for Regclean, a utility that comes with VB, I have come to mistrust it deeply. In a misguided moment I ran the latest version 3.0 which you can download from www.microsoft.com. The idea was to fix the annoying messages VB gives you when something is awry in the registry: "Object server not correctly registered". To my great amusement, the end result was worse. Post-Regclean, VB gave me this inspiring piece of technical information 148 times before it would open the Custom Controls dialog. At times like that, you reach for your registry backup with relief.

This problem is not going to go away. An added twist is that the software industry now gives huge distribution to beta versions, via demonstration CDs and over the web. We are all encouraged to spend our time installing trial software, often laden with ActiveX elements, and probably fixed to stop working after a certain date. Frankly, the registry stands no chance of staying clean in these circumstances. Naturally, it is not just developers who install all this stuff, but clients and users as well. Any application that uses standard Microsoft or third-party ActiveX controls or servers may find the ground sweetly removed from under its feet. In the meantime, here are my tips for avoiding registry hell:

1. Check your registry backup procedures.
2. Press Microsoft to come up with proper registry management tools, rather than these draconian "delete everything and reinstall" solutions.
3. Install beta software on a machine



Microsoft's RegClean 3.0: proceed at your own risk

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dedicated to that purpose. Do not install it on a system used for real work.

4. Persuade your users to adopt the same policy.

5. So you only have one PC? Well, you have been warned.

Delphi

Borland's Conference CD

Borland developers who look with envy at the Microsoft Developer Network CDs, stuffed with documentation and tips, will be interested in the recently issued Developer Conference CD. At first glance it looks great, with technical papers and example code covering many real-world problems. The two most prominent products are Delphi and C++ 5.0. The catch is that what you get depends on whether individual speakers at the 1996 Borland conference bothered to send in their notes.

For example, an entry on "Client server development using Delphi and Oracle" leads to a detailed article with source code and a Powerpoint slide show, while another entitled "Rapid application with Delphi 2.0" brings up only a speaker biography. Everything is in HTML and no search program is provided, so you are left to use your own search tools. You also get a collection of patches, technical notes and demonstration versions. Overall there are plenty of good nuggets of information, but it is all rather a mish-mash and mostly available free from Borland's web site. A useful resource, but not for the price Borland is asking.

Mixing Delphi and Access

Guy Cartwright writes: "I'm led to believe that, using Borland's Database Engine, I can access data stored in a Microsoft Access database. I've followed the procedure in a book and created an alias called TstAcess, but I get the message 'Application is not enabled for use with this driver. Alias: TstAccess'. I've trawled the net for an answer but to no avail."

Borland's Developer Conference CD has some great resources, but why pay when you can visit the web site?

Thanks to the popularity of Microsoft Office Professional and Visual Basic, desktop data is frequently stored in Access MDB files. This creates a problem for other applications which need to get at the data, especially since Microsoft has never documented the structure of an MDB. In any case, the format changes with each new release of Access. Borland's Database Engine can only get at an MDB through ODBC, which is the method Guy has tried. Sadly, the BDE is not at its best with ODBC, and Microsoft's ODBC drivers for Access are nothing special either.

The situation is complicated by the inclusion of ODBC drivers with Microsoft Office, that are designed only to work with Office applications. This might well cause the error Guy is seeing. It is important to get hold of the separate ODBC desktop driver pack, for example from the Microsoft Developer Network CDs, but even then it might not work. It needs the right combination of DLLs, registry entries and even INI files to work as it should, and one or other can easily get corrupted. Sometimes the only solution is to remove

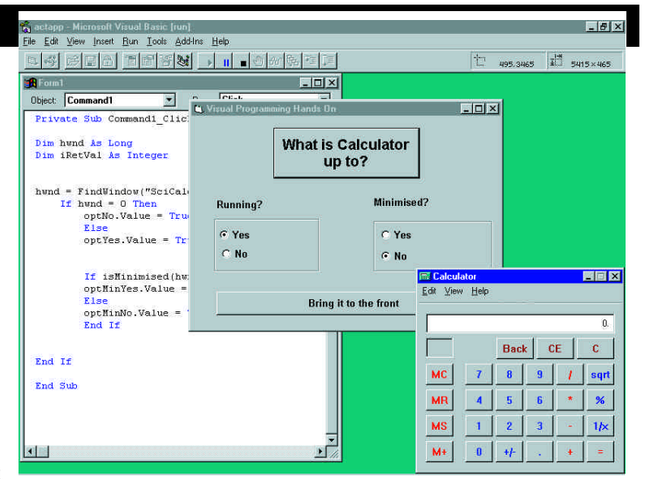
Fig 1 Routine written from the DAO COM interface

```
var
sSql: string;
dbEngine: Variant;
db: Variant;
snMembers: variant;

begin

sSql := 'Select * from members order by surname;';
dbEngine := CreateOleObject('DAO.DBEngine');
db := dbEngine.OpenDatabase('C:\DATA\SPORTS.MDB');
snMembers := db.OpenRecordSet(sSql, 4);
{4 is dbOpenSnapshot}

If not snMembers.EOF Then
begin
Edit1.text := snMembers.Fields['SURNAME'].Value;
end;

snMembers.close;
db.close;

end;
```


Powers of detection

Once you get started with Windows programming, you soon find you need to communicate with other applications. At its simplest, for example, you might want to run the Windows calculator from a menu option in a VB application. Easily done with the Shell function but what if the Calculator is already running? In that case, you probably want to bring forward the existing instance rather than starting a new one. Here is how you can find out.

The key to detecting an application is to look for its main window. The API offers functions for listing or searching all the current windows. FindWindow takes two parameters, both null terminated strings. The first is a classname, the second the text of a window title. You can search for one or both and if it finds a matching top-level window, FindWindow returns the handle. For example:



Using API functions you can find out which other applications are running

```
hwnd = FindWindow(vbNullString, "Calculator")
```

If it returns 0, then Calculator is not running. Of course FindWindow must be declared, and you can copy the declaration from VB's API viewer.

In the example above, FindWindow searched for the window title. This works fine with Calculator, although you could not be sure which calculator you were getting. It falls down with MDI applications, where a maximised document window adds its title to the main window. You might want to use the classname instead. It is not obvious what the right classname is, but there is another API function, GetClassName, which reveals all. Calculator turns out to have a classname of "SciCalc", while Word is "OpusApp". VB is "ThunderMain", and a VB application, "ThunderForm" or in version 4.0, "ThunderRTForm". Delphi applications get their classname from the name of the main application window, for example "TForm1". So the decision to look for a classname, a window title or both depends on which application you are trying to detect.

If the application is running, the next step is how to bring it forward. One possibility is the API function BringWindowToTop. For example, the following code detects Word and brings it forward if found:

```
hwnd = FindWindow("OpusApp", vbNullString)
    If hwnd <> 0 Then
    BringWindowToTop (hwnd)
   End if
```

The one time this will fail is if Word is running but minimised. A minimised window brought to the top is not much help. Time for another API function or two, in this case GetWindowPlacement and ShowWindow. Using the API viewer, add the declarations for the following:

```
GetWindowPlacement
ShowWindow
Type POINTAPI
Type RECT
Type WINDOWPLACEMENT
Public Const SW_SHOWMINIMIZED
Public Const SW_RESTORE
```

You can now discover whether a non-VB window is minimised like this:

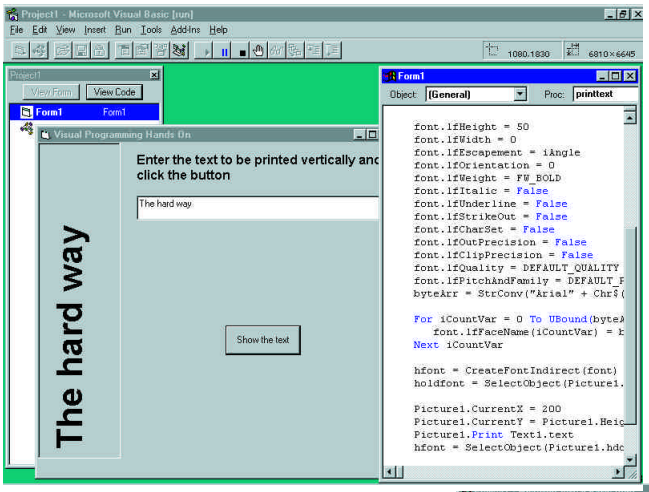
```
Function isMinimised(hwnd) As Boolean

    Dim lpWnd As WINDOWPLACEMENT
    lpWnd.Length = 44 ' 22 in 16-bit Windows
    Call GetWindowPlacement(hwnd, lpWnd)

    If lpWnd.showCmd = SW_SHOWMINIMIZED Then
    isMinimised = True
    Else
    isMinimised = False
    End If

End Function
```

Now the function for bringing Word forward can be modified as follows:

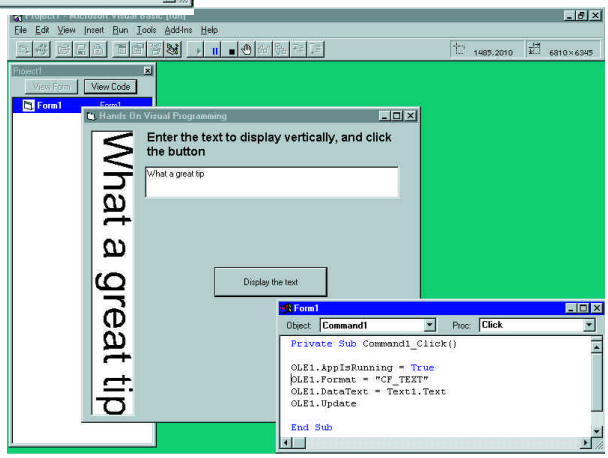
```
hwnd = FindWindow("OpusApp", vbNullString)
  If hwnd <> 0 Then
    If isMinimised(hwnd) Then
    iRetVal = ShowWindow(hwnd, SW_RESTORE)
    Else
    BringWindowToTop (hwnd)
    End if
  End if
```

If you look up GetWindowPlacement and ShowWindow in an API reference, you will find numerous other fields and parameters that give you fine control over the results. One point to notice is that the length field of a WINDOWPLACEMENT type (or structure in C) must be set before it is passed as a parameter in GetWindowPlacement. Unfortunately VB has no SIZEOF function, so you cannot do this neatly. All you need to know for the moment is that in 16-bit Windows the magic number is 22, and in 32-bit Windows it is 44. Occasional inconveniences like this are the price you pay for avoiding the intricacies of C.

p311 ➢



Left Vertical text the hard way, setting the font with the Windows API



Below Vertical text the easy way, using the OLE container and a WordArt object

both the ODBC driver and the BDE, weeding out any registry entries as well, and then to reinstall them both. Microsoft Query, which comes with Office, lets you test ODBC data sources by running queries against them.

There is another option if you are running Windows 95 or NT. Microsoft has created a COM interface to the JET database engine under the name Data Access Objects (DAO). It is documented and can be called from Delphi, and you can write routines like in Fig 1 *(page 308)*. For this to work, DAO must be installed on the system, as it will be if you have Microsoft Office 95, for example.

There are several other problems. Microsoft's documentation is aimed at users of Visual Basic or Visual C++, so you have to feel your way to some extent. None of Delphi's data-aware components will work. Finally, you cannot freely distribute the DAO files with a Delphi application. All but the last can be fixed by buying a third-party tool for using DAO with Delphi. Two well-known ones are Titan Access and Opus DirectAccess, while Nortech Software has a third in preparation. One of these is likely to be the smoothest route towards using Delphi with Access MDBs.

Visual Basic

Going vertical

Andy Smith asks: "How can I print vertical text in a Visual Basic application?"

There are a couple of easy solutions, and a better but more difficult one. The easy way is to use a paint program to rotate some text — Windows Paint or the shareware Paintshop Pro will do nicely — and paste it into an image control. You could even have several different messages and load them at runtime. For the best performance, do not load them from disk but use invisible image controls, or the PicClip control, or the Imagelist control.

If you want to be able to specify any text you like at runtime, another possibility is to use the WordArt applet that comes with Microsoft Office or Publisher. Here's how:

1. Pop an OLE container onto a form and set it to contain a new WordArt 2.0 object.
2. Right-click the OLE container and choose Open. In the WordArt dialog, choose the text shape and font required.
3. Use code like this to update the text at runtime:

```
OLE1.AppIsRunning = True
OLE1.Format = "CF_TEXT"
OLE1.DataText = Text1.Text
OLE1.Update
```

The snags with the WordArt approach are firstly that you need the applet installed on the user's system, and secondly a little overhead thanks to OLE. If that rules it out, the heavy coder's method is to call the Windows API. Windows uses a structure called a LOGFONT to define font characteristics, including several properties not exposed by VB's Font properties. One of these is lfEscapement, which specifies the angle of the text. Assuming that the y co-ordinates count from top to bottom, the lfEscapement field specifies the anti-clockwise angle in tenths of a degree. That means you can print diagonal text or even write a routine using a timer that would rotate text around a central point. To set a font using the API, take the following steps:

1. Declare the necessary API types, constants and functions.
2. Define the fields of a LOGFONT variable.
3. Create a logical font by calling Create-FontIndirect. This returns a handle to a font.
4. Select the font into a device context by calling SelectObject. For example, VB Picture Boxes, Forms, and the Printer object all have hdc properties which give you a handle to the device context.
5. Print to the device context using VB's print method or API functions such as TextOut or DrawText.
6. Clean up by unselecting the font and calling Delete-Object with the font handle.

Minimal sample code for drawing vertical text in VB 4.0 is included on the CD. Similar code works in VB 3.0 or 16-bit VB 4.0. It seems complex at first but it is the kind of code you can use again. Then again, alongside the four lines needed to automate WordArt, it does look like an argument for sticking to the easy way.

Cover CD

The MSDN starter edition for Visual Basic is on this month's cover-mounted CD-ROM. It includes 125Mb of searchable information on VB 3.0 and VB 4.0.

PCW Contacts

Tim Anderson welcomes your Visual Programming comments and tips. He can be contacted at the usual *PCW* address or at visual@pcw.vnu.co.uk

Borland Developers Conference CD £59 (plus VAT) from Borland 0800 454065
Delphi 2 Developer's Guide (Pacheco and Teixeira) from SAMS/Borland Press £54.99
Opus DirectAccess £189 (plus VAT) from QBS 0181 956 8000, www.opus.ch
Nortech Software is at www.wizzkids.com
Titan Access 32 is £225 (plus VAT) from QBS 0181 956 8000, www.reggatta.com

Pigs might fly

Mark Baynes finds hardware to be a boar, as he tries to install SAPS on Pig: even putting the boot in doesn't work. He's just in time to catch the Netport Express for a quick review, though.

Ever since I took over Hands On Networks I have had problem after problem with the hardware on my network, in particular a certain server which I shall refer to as "Pig". I would like to refer to it as "*!***?* !*?*" but apparently I can't, and anyway, if my Mum read it she would be a bit upset.

You may recall, in last month's column, I mentioned that Chris Langford emailed me to ask exactly *how* I was going to share a modem on NT Server over my LAN, and I replied that I was going to review a product called SAPS which does just this thing. So there I was, software in hand, all ready to demonstrate the wonders of SAPS, when Pig failed to re-boot. It was not resting … it was dead.

Now, this is not the first time I have had problems of this kind with Pig, so I knew it was a hardware problem and gave it a good kick, and I do mean a literal *kick*, not a metaphorical one. You should never treat hardware with too much respect and should always let it know who is boss whenever you have the chance. It responded slightly to the kick but because I was up against a deadline I had to review an Intel Netport instead. This was also somewhat problematic (as recalled here).

The funny thing was, I had copied all the data files on Pig to my other server "Big Boy" only two days before, because I wanted to reconfigure it with both NT and NetWare. Lucky, huh? The reason I mention this is that if you believe your server is going to last a lifetime, dream on. Mine is from a well-known manufacturer but has been on the blink for 12 of the 24 months I have been using it. I am not revealing the name of the server because, to be fair, it does receive a lot of abuse — apart from me kicking it. But when I do get it back together, Chris, I will definitely review SAPS — honest.

So there I was, all ready to review the Intel Netport Print Server (*see page 315*). I had the hardware installed, with a test page printed. I decided to install it under Windows 95 because NT Server was down, but I found that the Netport management software, running under Windows 95, couldn't see the Netport so I couldn't configure it.

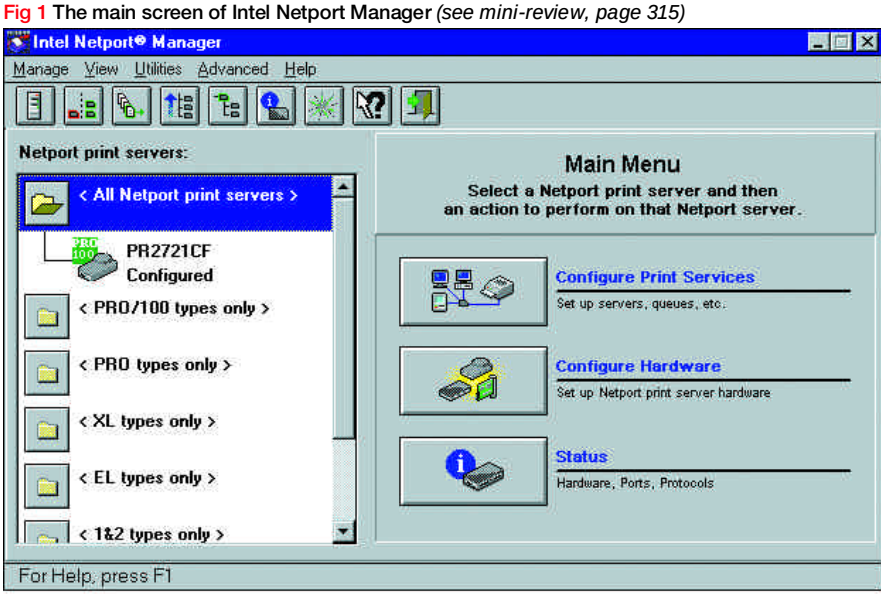
I turned it on and off several times and re-installed the software. I even read the Help file and realised that I needed NetBEUI installed. I re-booted but still got no joy, so I rang Intel tech support and spoke to two of their people for half an hour — very helpful but as baffled as I was — and then decided to attempt configuring from another workstation running Windows 95. Did this. Oops, same problem.

It seemed like a low-level protocol problem (it wasn't the physical media) and my instinct told me that the root of this problem was in Windows 95 itself, not with the Intel software. So I then installed the software onto another machine running NT Workstation 4.0: it instantly saw the Netport and allowed me to configure it.

I know I should really find out exactly what the problem was with Windows 95, but while my server may be a Pig, I also know that quite often, when networking, Windows 95 is a complete dog.

Next month: how to remove the impression of a size-ten boot from your server side panel.

Fig 1 **The main screen of Intel Netport Manager** *(see mini-review, page 315)*



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Mixed bag

A few words about correspondence: I am pleased to look at any queries you email me and find them very interesting, so please keep them coming. But I should point out that (a) due to lack of space I cannot print replies to them all, and (b) due to the lengthy process inherent in producing something the size of *PCW*, there is a significant delay between my receiving them and my reply appearing in this column, so don't wait for me to come up with a fix!

I will always tend towards answering the more generic questions as these are going to be of more use to more readers. And I will also favour those from individuals or those with limited backup support.

I received a query recently from someone working for a well-known IT consultant which charges hundreds of pounds a day for advice. I say to them: "Sorry, this column is for those of us who deal with little networks!"

OSI models and protocols

Q. "*It was good to see coverage of the OSI model in your column but I think you should make a distinction between the model, which applies to almost all comms protocol stacks, and the OSI protocols, which have a small user base, particularly now that the IP suite has taken over the world.*

"*Your example of two developers in California and Peckham being able to co-operate using the OSI model to interface network widgets would only work if they were using OSI protocols throughout. In fact, there is so much room for interpretation that the widgets would most likely interwork only if they were following a specific OSI profile such as GOSIP. Such profiles are the closest thing to 'an OSI stack', but to use the 'OSI stack' is seriously misleading.*

"*On the software side, there is also no reason why developers A and B should use even remotely compatible APIs. This has been a major problem with OSI and required the invention of things like System V Release 3 Streams and other models for the software side of protocol stacks.*

"*The API deficiencies of OSI are another reason why IP has taken over. The latter has a straightforward sockets API rather than a plethora of higher level APIs, and allows selection of suitable presentation/session layer functionality, depending on the application.*

"*For example, OSF DCE RPC has a very complex presentation layer function, while Telnet's is extremely simple, each being appropriate to the application domain.*"

richardd@cix.compulink.co.uk

A. Richard, thanks very much for your letter and for clearing this matter up. Any more questions about protocol stacks are coming directly your way!

Halfway house

Q. "*I was interested to read in the February issue of PCW that you intend to connect four PCs together using 10-Base T and to attach further resources straight to the hub. I have a similar situation. I have a 10-Base T network of four PCs plus two printers, and I would like to achieve independence of the PCs and the printers. We run a variety of software: at various times a machine might be running any of OS/2, Windows 95, Windows NT Workstation or Windows 3.x.*

"*The peer-to-peer style of networking permits each user to share resources such as printers, and to allow other workstations access. For example, workstation A has a printer and workstation B may use the printer as an output device. I do not like this example because the printer is owned by workstation A. I would like the printer to be a network device in its own right, and available to both workstations A and B. In the server style of networking the printer is owned by the server. The server is running permanently and allows workstations access to the printer.*

"*I want a halfway house situation where the printer is not owned by any workstation or server. I want the printer to be an independent network device in its own right. Any workstation may send work to the printer whenever it wishes.*

"*There are many sources of standalone box which will allow a printer to become a network device. All I have identified are intended for use with a server operating system. The printer, although connected as a network device, effectively becomes a slave of one particular server.*

"*Do you know of any software, or hardware/software combination, which will allow the same printer to be addressed as a network device from multiple workstations, with no server involved? I don't expect you to identify a solution for all of the software environments — any of them would be a start!*"

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Mini-review — Intel Netport Express PRO/100 Print Server

■ I have been trying to get my hands on one of Intel's Print Servers for quite a while now. I have reviewed a few print servers and, to be quite honest, a couple of them have been extremely poorly made. The Intel is quite the opposite, however, and is designed to withstand wear and tear.

At the front of the unit are the three printer ports, two parallel ports and one serial port, and on the left-hand side is an RJ-45 socket for a length of 10BaseT. There are a couple of recessed DIP switches, a diagnostics button and the connector for the power supply. The documentation is good, the first page of the Quick Start guide showing how to connect your printer(s) to the network.

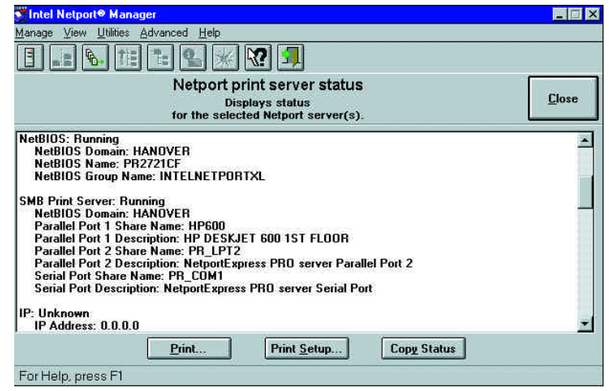


Fig 2 (right) The Netport print server status

Fig 3 (right) Basic identification details of my DeskJet 600 attached to the Netport

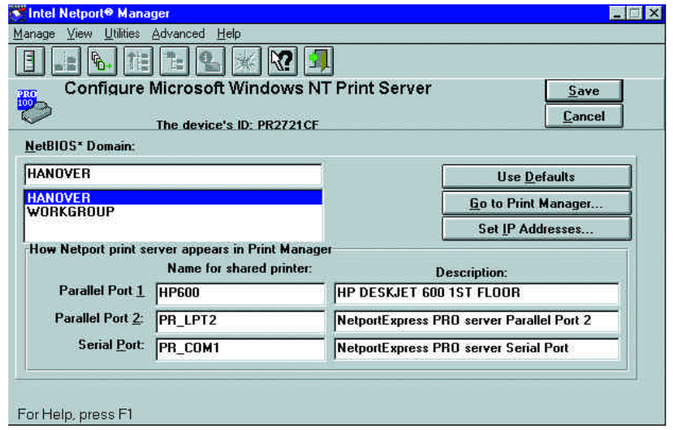
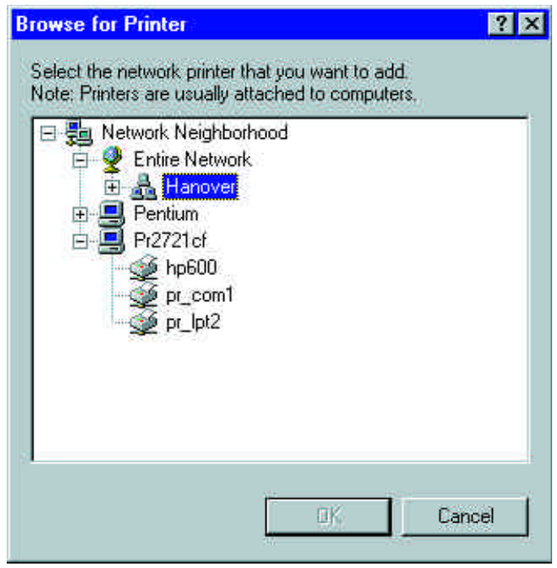


Fig 4 (below) At last! The Netport seen as Pr2721cf under Windows 95



I plugged in the Netport Express and the Activity, Transmit and Receive lights on top of the unit began to flash. I connected the existing printer cable from my tried-and-tested HP DeskJet 600 into parallel port one on the Netport Express and plugged a length of cable into the RJ-45 socket. It will auto-detect if your ethernet network is running at 10 or 100Mbits/sec. To test that all is well from a hardware point of view, you simply press the diagnostics button on the side of the Express and it should print a diagnostics report. Hardware setup time is three minutes.

I next installed the software. Network operating systems supported are Novell, NT, Windows 95, Windows for Workgroups, LAN Manager, IBM LAN Server and AppleTalk (Unix is also supported). I chose to install a 100MHz Pentium PC running Win95 and this is where my problems started — I could not get the Netport software (running under Win95) to see the Netport, but I eventually installed the software onto another PC running NT Workstation 4.0 and this went very smoothly indeed.

This is a nice, high-quality piece of hardware, but it's not cheap.

PCW Details

Price £468.82 (£399 ex VAT)
Contact Intel 01793 431155
Good Points High-quality, good management software but…
Bad Points …potential problems installing under Windows 95.
Conclusion Handy piece of kit for the small-to-medium-sized ethernet network.

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A. This is an interesting one! I have the feeling that what you are after does not exist, although I could be wrong.

In a peer-to-peer situation, a printer hangs off a specific PC which is, in fact, a print server for that PC dealing with the print queue. In a server-based LAN, the printer can hang off the server or, more likely, be an independent physical network device in its own right (*see mini-review of Intel Netport Print Server, page 315*) but — and it is a big "but" — the print queue has to be managed somewhere by the NOS. In a server LAN, this is going to be the NOS running on a server.

So your ideal of "a halfway house situation where the printer is not owned by any workstation or server" is not really possible because it has to be managed by something.

There goes the Neighbourhood

Q. *"I have a 486 DX4 100 running Windows 95 and a Pentium 75 with NT W/S 4.0.*

"Things ought to be going smoothly — after all, this sort of setup is Microsoft's dream, is it not? Well, unfortunately, the Windows 95 machine shows no computers in Network Neighbourhood — not even itself — even if the 'T-piece' on that machine has a terminator on both ends. The Entire Network icon exists but when attempting to open it I get the message: 'Unable to browse the network … it is not accessible'.

"The NT machine allows browsing of the network, but the other PC (the only other one on the network) does not show. I have toyed with the idea of a hardware fault, but I have tested everything I can think of and that appears not to be the case.

"I am a newcomer to networking and can't be sure all the settings on either machine are correct, but I am fairly confident. Any ideas? (The protocol I am using is TCP/IP, but I have also installed NetBEUI.)

"If I enable file/print sharing on the Win95 machine, it does appear in Network Neighbourhood although it takes a couple of minutes for this to happen, during which time it is still unable to browse the network."

alexi@margo.demon.co.uk

A. It is nice to know that this happens to other people apart from me! Don't worry about being a networking novice: I have been doing this stuff for over five years now and I still often find that after zapping my PC's hard drive and carrying out a reinstall (which I do on a regular basis to clear out all the dregs of software I have reviewed), I still get this problem from time to time.

I cannot tell you definitely what the problem is but try this:

1. The first thing to do when you have any network connection problems is to check the physical media — do you know for certain that the network cable works properly? Can you borrow another one on a working system for a while and try it with that?
2. Are you certain that the network cards in each machine work? If not, get their installation disks and run the self-test diagnostics. Then double-check to make sure there are no interrupt clashes; you can do this by looking in Settings/Control Panel/System.
3. Have you tried the Network troubleshooter in Windows 95 Help? This is quite good and has saved my bacon a couple of times.
4. Remove all your network software components and start again, but to start with try just running something simple like IPX or NetBEUI, before trying TCP/IP which is about as much fun to configure as putting your hand into a waste disposal unit and turning it on.
5. Have you tried Find Computer from either the Start menu or Windows Explorer? I have found in the past that although a computer will not show up in Network Neighbourhood you can "Find" it. Strange but true.
6. Zap both PCs and start again. It's a drastic measure but it often works. It depends how much software you have installed on them because some programs can, for no obvious reason, have side effects on others.

PCW Contact

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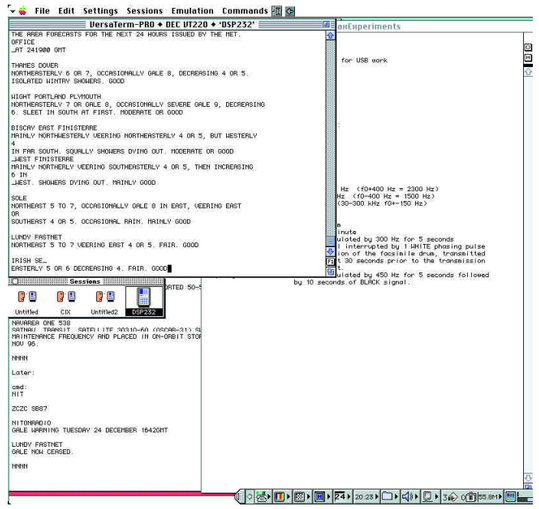
NeXT on the agenda

Howard Oakley hopes that Apple will capitalise fully on its recent acquisition of NeXT, including giving priority attention to a new MacOS filing system. Plus, comms chaos.

In recent years Apple has been more adept at delivering shocks than surprises, so it's a particular pleasure, when all eyes seemed turned towards Be, that we should hear of Apple's purchase of NeXT. While I am sure that Apple has clear plans for its latest acquisition, I am certain that those plans will prove as flexible as Copland, although hopefully it will unravel to a tighter schedule.

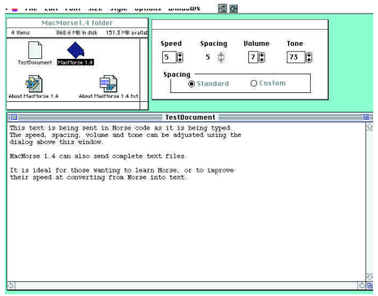
Whatever Apple does with NeXT, it seems sure that its combined products will be more exciting and that it will regain some of the initiative and leadership that has been on the wane. High on my wish list is a replacement filing system for MacOS, which will spare us having to patch up with Disk First Aid after each significant crash.

Just as Apple has managed to transform its implementation of Virtual Memory in System 7.5.5, so it should accord a high priority to the use of memory protection to minimise the consequence of crashes, too: that part of the Copland project (MacOS 8) also needs early introduction. And if the networking and security trappings which the NeXT team brings can turn a hybrid MacOS into a first-class operating system for corporates and the government sector, Apple's purchase will be money well spent.



Left AEA's DSP-232 radio modem connected to VersaTerm Pro, showing a received Navtex weather forecast. An hour or so later the software crashed, leading to comms chaos

Below Although most amateur radio software seems to have been written for Windows or MSDOS, MacMorse's fine Morse tutor is an excellent learning tool



Communication breakdown

Having cut my commercial programming teeth on a suite of applications to drive various bizarre devices through the Mac serial port, I tend to assume that ordinary communications can only be more simple.

If only this were so. This month's new hardware was not a conventional computer peripheral, but the ham radio equivalent of a modem (and more). AEA's DSP-232 is a peripheral of traditional and impressive design: a black box with lots of flashing coloured lights, more convincing than a succession of faceless and unlit platinum peripherals. Instead of converting between digital data fit for the serial port and whistles down a phone line, the DSP-232 works with the far weirder sounds used in radio data transmission. These range from cicada chirruping to rhythmic grating, demanding far greater versatility in the electronics.

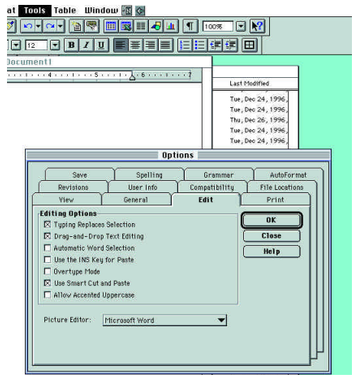
Rummaging through my confused knot of cables, I decided to use the 9-pin "D" (standard, newer PC serial port) to Mac 8-pin "DIN" (standard Mac serial port) cable provided with my new Olympus C-800L digital camera, connected to the 9-pin "D" to 9-pin "D" cable supplied with the DSP-232. With everything plumbed in, and the DSP-232 suitably fed with pops and crackles from an Icom R8500 communications receiver, I flashed up my regular communications software, VersaTerm Pro. At this stage, my interest was in receiving and decoding Navtex messages which contain weather forecasts, navigational warnings and the other bread and butter of mariners. All you should need is a decent receiver, a DSP-232, and a plain text terminal program. But VersaTerm, having obliged dutifully for a couple of hours, suddenly froze the screen. I tried Black Night, a fancy shareware program which uses the same neat communications tools installed in the Extensions folder (in my case, the Serial tool for the connection, and Text or TTY tools for terminal emulation). But it, too, locked up. Taking a multimeter to the cable, it was clear that the Olympus adaptor was not wired to support hardware handshaking, which the software and DSP-232 were expecting to use. When you buy (or make) Mac serial cables, make sure that each one has the special RTS and CTS lines properly connected so you can use hardware handshaking if necessary.

Even when I used a correctly wired cable, or turned hardware handshaking off in favour of the weaker XON/XOFF software method, the crashes still occurred. Switching to VT220 and other tools only made things worse.

I then turned to ZTerm, a popular if vanilla-flavoured shareware comms application. Although the current version predates a proper release version of Open Transport, ZTerm wisely fights shy of the Communications Toolbox while apparently remaining totally compatible with Open Transport. When in plain text mode you can set it to ignore the eighth bit of received characters, and in this way it sat and scrolled its way through pages and pages of Navtex, packet radio and the gibberish of noise, for hour after hour.

The lesson is that keeping it simple often keeps it stable. Because Apple has switched from the sophisticated but idiosyncratic Communications Toolbox to the sleeker Open Transport, older comms programs may be working through several layers of emulation (the 68K emulator on a Power Mac, and Open Transport's emulated support for tools) and with tools that were never completely debugged. Bring on the truly native Open Transport comms programs and all this should be a thing of the past, but they're not here just yet.

Thanks to Ian Cargill of Soliton Software for solving my longest-standing gripe with Microsoft Word 5: its apparent inability to allow you to select irregular parts of words. Use the Tools/Options… menu command to display Word's settings, pick the Edit tab panel and turn Automatic Word Selection off. It's as easy as that (just a bit of tricky navigation to get there)



What goes where in your System Folder?

The only enforced rigour on your Mac's hard disk is in the System Folder. If you want your Mac to work properly and benefit from the full features of all your applications, you must ensure that all files and folders within the System Folder are correctly named and at the right level in the hierarchy. Most software now comes with an intelligent installer which puts each file in the appropriate place, but sometimes you will have to install things by hand. Your first recourse is to drop the file(s) onto the System Folder and allow it to sort out the proper location for each: mostly it works, but sometimes you will need to correct errors.

System Folder A-Z guide

- [f] Apple Menu Items: desk accessories, applications and aliases to be accessed via entries in the Apple menu.
- [f] Claris: if you have installed any Claris applications, contains dictionaries, the XTND file translator system, help files and other materials for those applications.
- Clipboard: the last copied or cut item.
- [f] Control Panels: items accessible via the Control Panel menu, which may contain extension code.
- [f] Control Panels (Disabled): control panels which have been turned off using Extensions Manager.
- [f] Control Strip Modules: will be added to the Control Strip.
- [f] Desktop Printers: LaserWriter 8.4 and later printers shown on the desktop.
- [f] Extensions: a whole mass of extensions, communications tools, and shared libraries.
- [f] Extensions (Disabled): extensions which have been turned off using Extensions Manager.
- Finder: the Finder itself.
- [f] Fonts: installed fonts and PostScript fonts.
- Hosts: definitions for TCP/IP connections.
- [f] Launcher Items: aliases which appear in the Launcher.
- MacsBug: a low-level debugger which can help you cope with crashes.
- [f] Preferences: settings and preference files and folders for applications, although a few older ones still place their files in the System Folder itself.
- [f] PrintMonitor Documents: documents being printed in the background.
- Scrapbook File: the contents of your Scrapbook (in the Apple menu).
- [f] Shutdown Items: aliases etc. to be run automatically before shutting down.
- [f] Startup Items: aliases etc. to be started when your Mac starts up.
- System: the System file itself.
- System Updates: additions to the System file.
- [f] System Extensions (Disabled): older extensions normally littered around in the System Folder itself, when turned off with Extensions Manager.
- [f] Application-specific folders and files.

Note: [f] indicates that the item is a folder; others are files — see Fig 1 for icons.

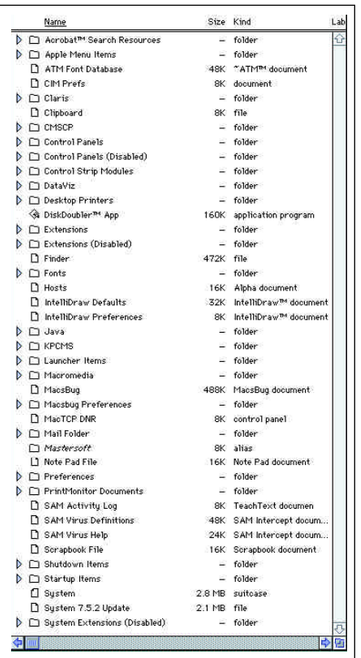


Fig 1 The System Folder contains a strict hierarchy of folders and files. When installing software, give the Finder a chance to put files in the right places, but correct any mistakes

PCW Contacts

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Apple Computer: 0181 569 1199. Web address www.apple.com and www.euro.apple.com
AEA radio modems and radio hardware are distributed by **Nevada: 01705 662145**. Web address www.nevada.co.uk/
ZTerm 1.0.1 is $30 shareware by David Alverson, available from all Mac online resources
MacMorse 1.4 is $15 shareware from Doug Havenhill and can be found in the Ham Radio archive at ftp.demon.co.uk/pub/ham/mac/

Card sharp

You'll find a sound card and/or a graphics card in almost every PC sold these days. Here we present an overview of the technical concepts involved in both.

Just about every consumer PC sold these days comes with a sound card. But back in the quiet, dark ages when the PC was first conceived, sound was the last thing on the agenda. Computers were purely business tools and the internal speaker was only present so that it could beep when you did something wrong.

But with the increase in popularity of multimedia in the last few years, sound cards have advanced considerably and there is a vast range available from £25 to £250. Alongside making games and multimedia sound wonderful, they can allow you to compose, edit and print your own music as well as record and edit digital audio and play audio CDs from your desktop.

Whether you're buying a sound card for the first time or upgrading your existing model, it helps to understand some of the underlying principles of sound generation on PCs. Here we've given a brief summary of the most important technical concepts relating to sound.

Frequency Modulation (FM)

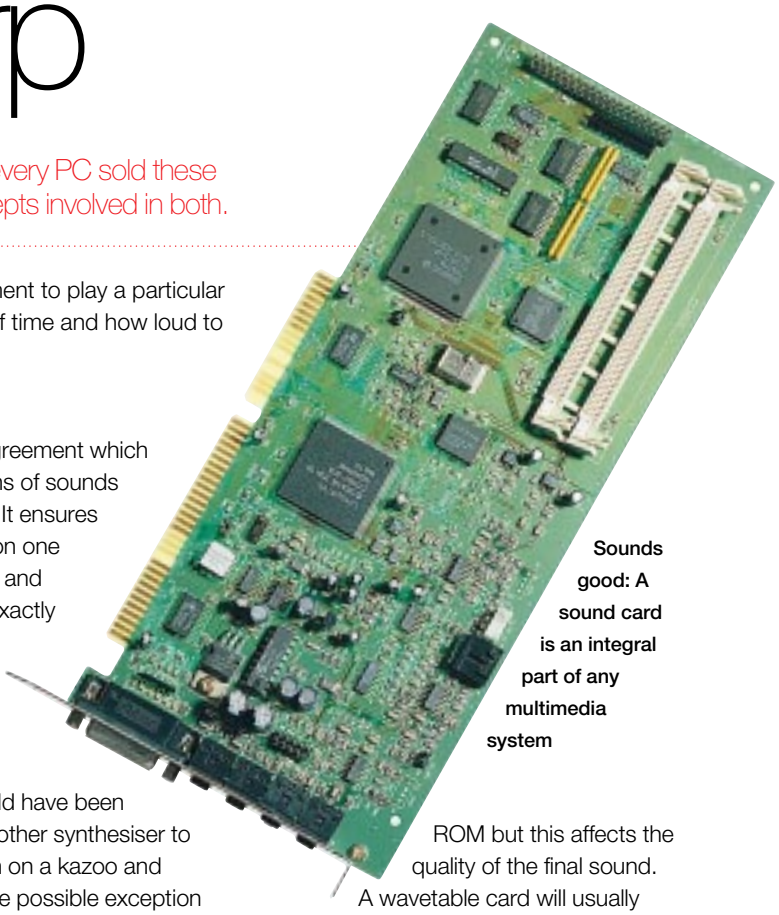
This was the first standard technology to be used in sound cards. It was also used in the first music synthesisers and made a huge impact on the pop world back in the early eighties. FM works by overlaying a number of simple sound waves in order to simulate real instruments. However, this technique can only approximate the sound of a guitar (for example) because the real thing is far to complex for FM to reproduce accurately. Wavetable synthesis (described here) is much more realistic.

Musical Instrument Digital Interface (MIDI)

This was developed as a communications protocol for musical instruments to "talk" to each other. Today it is used mainly for sequencing, which allows complex musical arrangements to be built up that would be impossible to play by one person alone. The most common instructions tell the receiving instrument to play a particular note for a duration of time and how loud to play it.

General MIDI

This is a standard agreement which specifies the locations of sounds within a synthesiser. It ensures that a piece written on one synthesiser for drum and bass will come out exactly the same when played through any other synthesiser. Before General MIDI was implemented, it would have been quite possible for another synthesiser to play the composition on a kazoo and French horn. With the possible exception of fanatical modern jazz afficionados, most people appreciate hearing music as it is meant to be heard.



Sounds good: A sound card is an integral part of any multimedia system

DSP (Digital Signal Processor)

A DSP chip allows the use of effects like reverb, echo, stereo chorus and delay, adding considerably to the overall quality of the sound. Using the same technology, some modern hi-fi systems give you the option of hearing music as if it's being played in a concert hall or a football stadium.

Wavetable

Sound cards with wavetable synthesis play back pre-recorded samples of real instruments. The quality of the samples can vary considerably because of the factors involved in recording the sounds. These include the quality of the original recordings, the number of samples taken for each instrument and the method of compression used. Because they sound different depending on how they are played, a number of different samples have to be recorded for each instrument. A high-compression method means that many samples can be stored in the wavetable ROM but this affects the quality of the final sound.

A wavetable card will usually have between 1Mb and 4Mb ROM (the bigger the better) but reproducing a piano's sound accurately could take up as much as 10Mb, so it's understandable that synthesised instruments never really sound like the real thing.

Wavetable Daughterboard

If you're thinking of improving the sound capability of your PC, check out your existing sound card first to see if it has a feature connector. If it does, then you could save some money by upgrading the card with a wavetable daughterboard. Wavetable daughterboards are compatible with any 16-bit sound card that has a feature connector. This is located to the bottom left-hand side of the card near the blanking plate and looks similar to a CD-ROM interface, only smaller. Some cards, including the Value edition of the SoundBlaster 16, do not have this connector, so check first.

Installing a wavetable daughterboard couldn't be easier. Simply remove your sound card and "sit" the daughterboard on top, making sure the connectors are firmly attached. Three plastic spacers will also be provided which prevent the two cards from damaging each other.

p324 ➢

SoundBlaster

This is not so much a technical issue as one of compatibility. If you're into games, make sure any sound card you buy is 100 percent SoundBlaster compatible. This will save you a lot of heartache in the long run.

Graphics Cards

Virtually every PC contains a graphics card — it's the one your monitor lead plugs into. But what does it actually do?

Data from the CPU is fed into the graphics card where it is processed and placed in the Video Memory. This stores a "mirror" of the image that you see on your monitor. The "mirror" is read by the Digital Analogue Converter (RAMDAC) and converted from digital data to analogue information which is sent to the monitor. This happens many times a second — the refresh rate (in Hz (hertz)) is the number of times per second that the screen is redrawn.

This should give you some idea of the amount of information a graphics card has to deal with. Consider a Windows environment at 1024 x 768 resolution with 24-bit colour depth. Each screen here is made up of 18,874,368 bits of information. That's a lot, but let's not forget that the screen should be redisplayed at least 75 times a second. That's 1,415,577,600 bits of information every second!

How does the graphics card cope? There are two factors. Firstly, the size of the RAM on the card must be large enough to contain an entire "mirror" of the screen image. If you've got 1Mb there's no way your card could cope with the example given above.

Secondly, the card must be able to get the data out of the Video Memory and into the monitor quickly. The speed of the RAMDAC and Video Memory both affect this performance considerably.

The other factor in processing the data is the size of the Video Memory bus (how many bits of information can be read in one go). Most graphics cards these days have 64-bit buses, but there are a few (expensive) cards around with 128-bit buses.

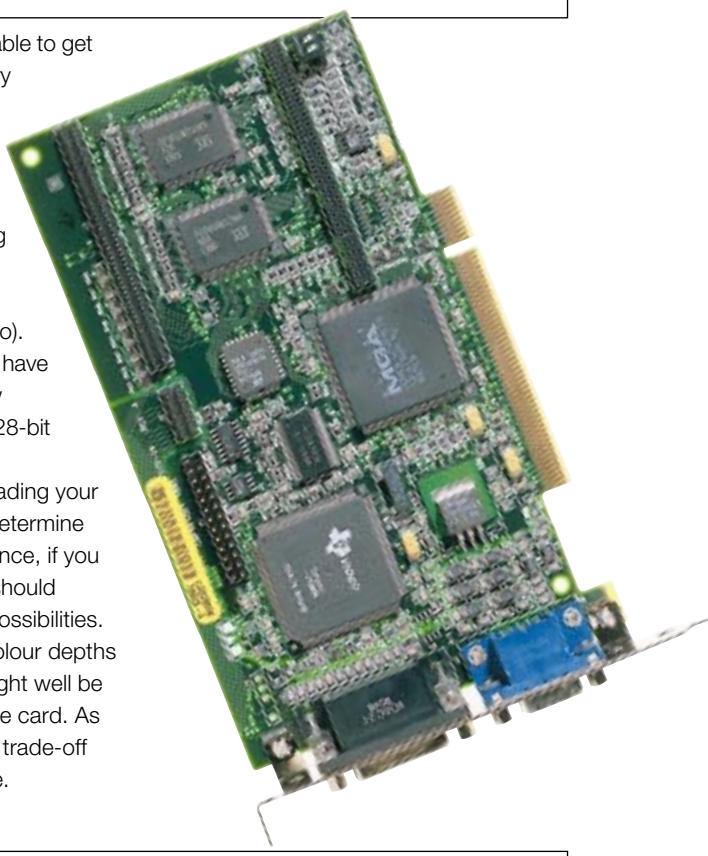
If you're thinking about upgrading your graphics card you should first determine what you want from it. For instance, if you play a lot of games, a 3D card should feature strongly on your list of possibilities. Are high resolutions and high colour depths important to you? If not, you might well be perfectly happy with a mid-range card. As always with PC hardware, it's a trade-off between price and performance.

Plug and Play

"Plug and Pay" is a standard introduced by Microsoft in Windows 95. Essentially, it was introduced to make the installation of new devices easier by automating the whole process.

Windows 95 includes drivers for a large number of sound cards and should automatically detect plug-and-play cards on installation. It scans your files for existing drivers on installation. If the card's drivers are pre-bundled with the OS, they'll be installed and configured for you. If not, you'll be prompted for an installation disk.

Sound cards which are not plug-and-play compatible must be installed manually using the Add New Hardware wizard in Windows 95. As with many plug-and-play devices, the "seamless integration" concept does not always find its way into reality, and often, cards which claim to conform to the plug-and-play standard do not install smoothly.



Glossary

DRAM (Dynamic Random Access Memory) Standard memory chip mainly used in older PCs. Less efficient than VRAM or EDO RAM.

EDO RAM (Extended Data Out RAM) A more efficient type of memory with faster access time. Almost all new PCs are fitted with EDO RAM.

VRAM (Video RAM) Fast memory optimised for graphics cards. Faster than EDO RAM.

WRAM (Windows RAM) Fast video memory optimised for displaying Windows.

RAMDAC or DAC (Random Access Memory Digital to Analogue Convertor) Converts the digital data from the PC to the analogue information required by the monitor for display.

LPB (Local peripheral Bus) A specific feature connector used to connect MPEG or other related components (such as TV tuners) to the graphics card.

Refresh Rate (or vertical scan rate) The frequency with which the whole screen is refreshed (or redrawn). At 60Hz (60 times per second) flicker is quite apparent. Above 72Hz the flicker appears to go away. Increasing the refresh rate above 75Hz makes the image increasingly solid.

Interlacing Where only every other line on the screen is refreshed with each pass. The result is very flickery and certainly not recommended for long periods.

Virtual Desktop When the card is capable of holding in its memory a screen image bigger than that displayed on the monitor. The monitor acts as a window onto a larger desktop.

On-the-fly-switching The ability to change screen resolution, colour depth or refresh rates without having to restart your PC.

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 14.4kb/sec modems are not the bargain they seem. Opt for 28.8kb/sec or one of the new 33.6kb/sec modems when they become available.

Buying Do's

- You can never have too much disk space. Spend extra cash on buying the next largest hard disk size.
- Make sure Pentium motherboards have an Intel Triton chipset; either 430HX or 430VX.
- 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 contact?
- For home use, you'll probably want full multimedia capabilities to enable you to use CD-ROM games and edutainment products and play video clips. This should include at least a 16-bit SoundBlaster-compatible soundcard and speakers.
- Think about ordering more memory. RAM prices are low at the moment but creeping up — you can pick up 16Mb of EDO RAM for around £100 or less

Upgrading memory to 32Mb is also the quickest way to improve the performance of your machine — often more so 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 one third of the recommended retail price. Multimedia CD-ROM bundles will not include the UK version of Encarta 96 — Microsoft only allows the US version to be bundled.

Other things to consider

PCs have become similar in the last few years. The days when smallish computer companies designed their own chipsets (the 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 motherboards themselves (Apricot, Compaq, IBM) or get motherboards built by other companies to their specifications (Gateway).

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 soundcard 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. Remember that, unlike your hi-fi setup, good speakers are powered from the mains, not from your PC.

You can read our up-to-date PC reviews in every issue of *PCW*.

•PCW Second-hand specification

Buying second-hand or discontinued kit is the cheapest way to get started. This is the minimum spec we think you should go choose for general business use, playing games and accessing the internet.

- Windows 3.1 or 3.11
- DX2 66Mhz 486 processor
- 8Mb RAM
- Graphics card with 512Kb of memory
- 200Mb hard disk
- 3.5in floppy disk
- CD-ROM drive
- 14in colour monitor

•PCW Minimum specification

This is the absolute minimum spec we think you should consider if you're buying a new PC. Suitable for general business use: word processing, databases and spreadsheets and, with a modem, accessing the internet.

- Windows 95
- 100MHz Pentium processor
- 16Mb RAM
- Graphics card with 1Mb of memory
- 1.2Gb hard disk
- Quad-speed CD-ROM drive
- 14in colour monitor
- PCI local bus

•PCW Recommended specification

If you're not strapped for cash, this is the specification we recommend. No-one at *PCW* would settle for less.

- Windows 95 or Windows NT 4.0
- Pentium or equivalent 166MHz processor (a fast processor will make your computer run quicker and more smoothly)
- 256Kb secondary cache
- 32Mb EDO RAM.
- Graphics card with 2Mb of memory
- 2Gb hard disk — modern computer software takes up a lot of space
- Six-speed CD-ROM drive (video clips will play more smoothly and you will be able to access files on CD-ROM disks more quickly)
- 15in colour monitor
- 16-bit SoundBlaster-compatible soundcard

•PCW Best specification

This is as good a PC as you are likely to need for most software. For some specialist applications, like professional DTP or CAD, you may need even more memory, a bigger hard disk, a more powerful graphics card, or a larger monitor.

- Windows 95 or Windows NT4.0
- Pentium 200MHz MMX or Pentium Pro
- 512Kb secondary cache
- 32Mb EDO memory
- 4Gb hard disk
- Eight-speed CD-ROM drive
- 17in colour monitor
- 4Mb VRAM or WRAM graphics card (this means your graphics card can display more colours and at a higher resolution on your monitor: 16 million colours at a resolution of up to 1,280 x 1,024
- 16-bit wavetable soundcard

**** We assume that any new PC has PCI local bus and a 3.5in floppy disk drive.***

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 seems to be a problem and it can be fiendishly difficult to obtain spares. A useful guideline when choosing a notebook is: try before you buy.

Remember that 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** These are rapidly becoming standard in notebooks. If your notebook is going to be your only machine, it's worth getting one.
- **Floppy disk drive** Often there's a choice between a CD-ROM drive and a floppy disk drive. If the notebook is to be your only machine, make sure the CD-ROM drive and floppy can be used simultaneously.
- **PC Cards** Modern notebooks all have at least one PC Card slot. They take credit-card-sized expansion cards which add a fax-modem, a network interface card or even an extra hard disk to your computer.
- **Battery life** Battery life varies from as little as 30 minutes to over six hours. Lithium Ion and Nickel Metal Hydride batteries have now replaced the older NiCad (Nickel Cadmium) batteries.
- **TFT screens** TFT or active matrix screens are replacing the slower dual-scan or passive matrix screens. It means the screen image is refreshed far 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 quickly. It's possible to pick up end-of-line machines with Pentium processors from brand-name manufacturers like Toshiba and Compaq at discounted prices of £1,000 or less. These can be a very good buy. Just make sure they can run the software you need to use.

•PCW Recommended specification

- Windows 95
- Pentium
- Quad or six-speed CD-ROM drive
- 256Kb secondary cache
- 16Mb RAM
- On-board graphics with 1Mb of memory, PCI local bus
- 850Mb hard disk, 3.5in floppy disk drive and/or dual-speed CD-ROM drive
- TFT 800 x 600 screen

•PCW Best specification

The state-of-the-art notebook: either you're loaded, or your company's picking up the tab.

- Windows 95 or Windows NT
- Pentium
- 256Kb secondary cache
- 32Mb RAM
- On-board graphics with 2Mb of VRAM memory, PCI local bus
- 1.2Gb hard disk
- 3.5in floppy disk drive
- Eight-speed CD-ROM drive
- Active matrix 1,024 x 768 TFT screen
- Long battery life

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Glossary of computing terms

A

Access time
The time it takes for a device to access data. The access time, quoted in milliseconds (ms) for hard disks and nanoseconds (ns) for memory, is usually an average as it can vary greatly. Together with the transfer rate, it is used to gauge the performance of hard disks and other devices. The lower the number, the better the performance.

Applications
An application, or package, is one or more programs used for a particular task. For example: word processing, invoicing or spreadsheeting. Applications are bought shrink-wrapped (wrapped in cellophane for general use) or custom-built for specific uses.

ASCII (American Standard Code for Information Interchange)
Usually a synonym for plain text without any formatting (like italics, bold or hidden text). Since computers naturally use binary rather than Roman characters, text has to be converted into binary in order for the processor to understand it. ASCII assigns binary values to Roman characters. RTF, a Microsoft standard, adds extra formatting features to plain ASCII.

B

Backwards compatible
Compatibility of hardware or software to older versions of the product or standard.

Baud rate
The 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. 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 2^{10} (1,024 bits); and a Megabit is 2^{20}, which is just over a million bits. These units are often used for data transmission. For data storage, Megabytes are more generally used. A Megabyte (Mb) is 1,024 kilobytes (Kb) and a Kb is 1,024 bytes. A Gigabyte (Gb) is 1,024Mb. A byte (binary digit eight) is composed of eight bits.

Bug (See Crash)

Boot
Short for bootstrap. Refers to the process when a computer loads its operating system into memory. Reboot means to restart your computer after a crash, either with a warm reboot (where you press CtrlAltDel) 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, yet this makes them ideal for archiving.

CISC (See **RISC**)

CPU
Central processing unit. Normally refers to the main processor or chip inside a PC. (See Processor).

Crash
Common term for when your computer freezes. Can be caused by a power surge, a bug (which is a fault in software), or a GPF.

D

DRAM (See Memory)

DOS (Disk Operating System)
Once the standard operating system for PCs, it is now being replaced by Windows 95 and Windows NT.

DPI (Dots Per Inch)
Common measure of the resolution on a printer, a scanner or a display.

Drive controller card
An expansion card that interprets commands between the processor and the disk drives.

Drivers
Pieces of software that "drive" a peripheral. They interpret between the computer and a device such as a CD-ROM. If you have a SCSI CD-ROM drive connected, you will be able to use it on a PC or a Mac just by loading up the relevant driver on each machine.

E

EIDE (See IDE)

EISA (Extended Industry Standard Architecture)
A bus standard designed to compete with MCA. Now being replaced by PCI.

Electronic mail (E-mail, email)
Still the biggest single use of the internet. When you sign up with an ISP you are given an email address. Usually you can incorporate your name, or part of it, into your email address to make it easy to remember.

Expansion card
Circuit boards that fit inside PCs to provide extra functionality. For example, one might be an internal modem, providing the same functions as an external version (which is more common) but sitting inside the PC. Expansion cards are designed to be fitted and removed by people with little knowledge of PCs.

F

Floppy disk drive
Practically all PCs come with a floppy disk drive. 3.5in HD (high density) 1.44Mb floppy disks are now the standard. They come in hard plastic cases and have replaced the older, literally floppy, 5.25in disks.

Fonts
A font is an alphabet designed in a particular style. Fonts apply to both screen and printed letters. TrueType and Type 1 fonts are stored as shape descriptions, scalable to any size.

Format
To wipe a floppy or hard disk in order to prepare it to accept data.

G

GPF
General protection fault.

Graphics card
An expansion card 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, which can be read by web browsers.

I

IBM-compatible
Originally meant any PC compatible with DOS. Now tends to mean any PC with an Intel or compatible processor capable of running DOS or Windows.

IDE
Integrated drive electronics. A

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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 — the standard for exchanging data using infra-red, typically from PDAs or notebooks to a PC or printer.

ISA (Industry Standard Architecture)
This was the original bus architecture on 286 PCs. Also known as the AT bus (the 286 was known as the AT), it 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)
Offers significant advantages over analogue telephone lines. It can handle multiple transfers on a single connection and is faster. In the UK, however, costs of installation and rental are still high.

J

JPEG (See MPEG)

K

Kbit (kilobit), Kb (kilobyte)
(See Bit)

L

LAN (Local Area Network)
(See Network)

Local Bus
PCI (Peripheral Component Interconnect), developed by Intel, is now the standard for local bus architecture. It is faster than the older VL-Bus (Video Electronic Standards Association local bus) it replaces.

M

Macintosh (Mac)
A personal computer made by Apple and which is incompatible with PCs. Developed as a rival standard, its operating system looks like Windows, but pre-dates it and (in some people's view) looks and works much better.

Maths co-processor
A specialised chip that handles mathematical calculations (floating point operations) for the processor. Modern processors such as the Pentium have a co-processor built into them.

Mbit (megabit) (See Bit)

Mb (megabyte) (See Bit)

MCA
A type of bus designed by IBM to beat EISA. Although faster, it never became popular because every machine that used it had to pay a royalty to IBM, and because it was not backwards-compatible with ISA.

MPEG (Moving Picture Expert Group)
A standard for compressing video available in several flavours: MPEG 1, MPEG 2, MPEG 4. JPEG (Joint Photographic Expert Group) is a standard for still image compression.

Memory
The term normally refers to RAM (Random Access Memory). This is the kind that disappears when you turn off your computer and is much faster to access than a hard disk. It acts as a staging post between your computer's hard disk and its main processor.
• 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 in-built cache. This can be further speeded up by a secondary cache, typically 256Kb. Part of your DRAM is often used to cache your hard disk.
• ROM (Read-Only Memory) A type of memory which can only be read: you can't make changes to it as you can to RAM. It is commonly used for things that will never need to be changed, such as the information the computer requires when you start it up.

MMX (Multimedia extensions)
(See Pentium)

Modem
The word is a contracted version of "modulator/demodulator", which means that a modem is a box (or, less commonly, an expansion card) that lets your computer talk over phone lines to other computers.

Monitor
Your computer's screen. Signals are sent to it from the video card.

Motherboard
The main printed circuit board which houses processor, memory and other components.

N

Network
A network is a group of computers linked together with cable. The most common form is a LAN (Local Area Network), where electronic mail and other files can be exchanged between users without swapping floppy disks. Printers and other resources can be shared. All the PCs on a LAN are connected to one server, which is a powerful PC with a large hard disk that can be shared by everyone.

O

OS (Operating System)
The operating system communicates with the hardware and provides services and utilities to applications while they run, such as saving and retrieving files.

P

PC Card
Formerly PCMCIA. A standard to allow PCs, particularly notebooks, to be expanded using credit-card sized cards.

PDA (Personal Digital Assistant)
Small electronic organisers. The Psion 3a is a typical example.

PCI (See Local bus)

PCMCIA (See PC cards)

Package (See Application)

Parallel ports
Used by your PC to communicate with the outside world, usually via a printer. Information can travel in parallel along a series of lines, making it faster than serial ports which can only handle one piece of information at a time.

Pentium
Fast 32-bit processor with a built-in 16Kb cache. Now the standard on PCs. It is about to be replaced by the Pentium MMX chip which has extra instructions and a 32Kb cache. The Pentium Pro is a higher end workstation CPU with 256Kb cache meant for full 32-bit operating systems such as Windows NT.

Pixel
Picture element. The smallest addressable dot displayed on a monitor.

PowerPC
This family of RISC chips is the result of a collaboration between IBM, Apple and Motorola. It is now used in all Apple Macintosh computers and many IBM workstations.

Processor
The chip that does most of a computer's work.

Programs (See Applications)

Public domain
Software that is absolutely free. The author usually retains the copyright but you can make as many copies as you want and pass them to other people. "Public domain" software is often confused with "shareware".

Q

QWERTY
The name of a standard English-language keyboard, derived from the first six letters in the top row. 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're usually faster. The PowerPC chip is a typical example.

ROM (Read Only Memory)
(See Memory)

RTF (Rich Text Format) (See ASCII)

S

SCSI
Small Computer System Interface is a bus that comes as standard in a Macintosh and is starting to rival EIDE on PCs.

Serial port
Serial ports (com1 and com2) are used by your PC to communicate with the outside world. Serial ports are mostly used by modems and similar devices which communicate quite slowly. Faster communications are achieved via the parallel port.

Shareware
A method of distributing software. It is freely available, but not free-of-charge. You are honour-bound to pay a small fee to the software's developer if you continue to use the program after a set period.

SIMM (Single Inline Memory Module)
The standard modules for memory expansion on PCs. Older 30-pin SIMMs have now been replaced by the 72-pin variety available in capacities up to 16Mb.

T

Tape streamer
Magnetic tape recorder for backing up data from a hard disk.

U/V

UART (Universal Asynchronous Receiver Transmitter)
Pronounced "you-art". A chip that allows your PC to cope with high-speed communications.

(…Glossary continued on p334)

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How to choose an ISP

There are now over 100 Internet Service Providers, which makes selecting the right one a difficult task. Competition between them is now so fierce that many Providers are happy to offer a month's free trial.

All ISPs (Information Service Providers) allow you to send and receive internet email, browse the web and download files from internet servers. But there are differences between the extra services that each provides.

Large, centralised, online services like AOL and CompuServe offer discussion areas and specialised content like online magazines, and searchable file libraries and are easy to use. However they are not the fastest way of accessing the World Wide Web.

Some ISPs 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. The 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 chosen ISP can have a big effect on the performance of your internet connection, particularly access speed to US site. Relatively few ISPs provide local call access to anywhere in the UK. In London you'll have plenty of choice, but in the west of Scotland, say, the choice will be limited.

•PCW Recommended products

Big, commercial ISPs are not cheap, but are easy to use, with plenty of extra services thrown in: **CompuServe 0800 289378; AOL 0171 385 9404**

Barebones service which is not for beginners but it does make your PC a full internet node in its own right: **Demon 0181 371 1000**

Another established service provider 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 much like photocopiers, and are cheap to run and print quickly. The disadvantage is the higher initial cost and mono output. Laser printers are available in all sizes and 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 print by sending a description of the page to be printed down a printer cable. There are three commonly-used page description languages (PDLs):

• PostScript
This sends an outline in vector form (see *Drawing Software*) to the printer where it is rasterised (converted into dots) and printed to the device's best ability. PostScript is device-independent so the image looks the same on a monitor (75dpi), a laser printer (300dpi) and professional image-setter (2,400dpi).

• 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 machine 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 only work with Windows but are cheap and fast. They are 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 1996)
- **Sub-£750 lasers** Hewlett-Packard 5P: **Hewlett-Packard 01344 369222** (see *PCW* November 1995)
- **Network lasers** Hewlett-Packard 5P: **Hewlett-Packard 01344 369222** (see *PCW* February 1996)

Inkjets
Inkjets work by spraying ink onto paper. There are still some mono inkjet printers available, but it is best to stick with a colour inkjet printer as the price difference is negligible. They are cheap to buy but more expensive to run, and slower. Even cheap inkjets can print in good quality colour, especially on high-resolution paper.

•PCW Recommended products

H-P Deskjet 870CXi: **H-P 0990 474747;** street price £311.

Lexmark 2070: **Lexmark 01628 481500;** street price £280. (See *PCW* November 1996).

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

Brother HL 730: **Brother 0161 330 6531**. £270.

Sharp JX 9210: **Sharp 01753 819819**. £209. (see *PCW* January 1997)

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, costing from £300 to over £3,000. They are capable of scanning colour pictures to a high standard. Most have transparency adaptors as optional extras.

Document scanners
A new category 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.

•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 1996).

•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 1996).

Buying a **Fax Modem**

You'll need a modem to connect to the internet or an online service, such as CompuServe or AOL, and also to send and receive email.

Modems are available in three formats: 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 expansion cards.

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 built-in fax capability, which means you can receive faxes on your PC to view or print out. If you're strapped for cash, a V32bis 14.4kb/sec modem is just about adequate, although

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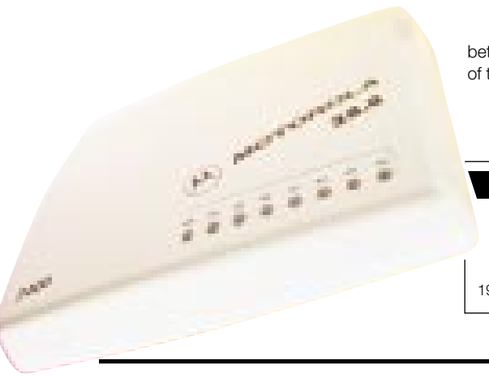


better to buy a V34 28.8kb/sec modem or one of the new V34 Plus 33.6kb/sec modems.

PCW Recommended products

Fax modems

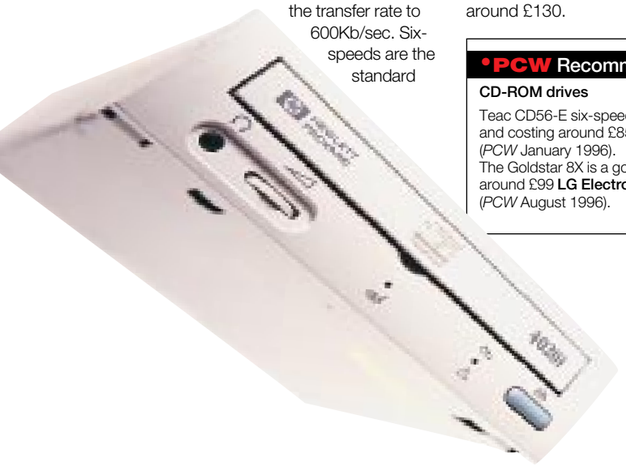
• External — Hayes Accura 288 Message Modem **Hayes 01252 775 577** street price £145. (see *PCW* November 1996, December 1996).

Buying a CD-ROM Drive

Just about the only things which vary 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 soundcards.

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 the transfer rate to 600Kb/sec. Six-speeds are the standard (900Kb/sec), with eight-speeds (1,200Kb/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 drives

Teac CD56-E six-speed: fitted to many new PCs and costing around £85 **Teac 01923 225235** (*PCW* January 1996).

The Goldstar 8X is a good eight-speed choice for around £99 **LG Electronics 01753 691 888** (*PCW* August 1996).

Glossary

(contd. from p331)

V34 Plus, V34, V32bis
A series of CCITT standards that defines modem operations and error correction. There are more than 20, but the key ones are:
• **V32.bis**, the standard for 14.4kb/sec modems.
• **V34**, the standard for 28.8kb/sec modems (see Baud).
• **V34 Plus**, the new standard for speeds up to 33.6kb/sec.

VESA (See Local Bus)

VGA
Video Graphics Array is the name given to a popular display. VGA graphics have 640 pixels horizontally and 480 vertically, and can display 16 colours. SuperVGA (SVGA) graphics can display 800 x 600 or 1,024 x 768 in as many colours as the memory in your graphics card will allow: up to 16.4 million, or true colour.

VL-Bus (See Local Bus)

VRAM (See Memory)

W

Windows
A GUI (Graphical User Interface) developed by Microsoft. Windows is intended to make programs easier to use by giving them a standard, mouse-driven interface.
• **Windows 3.11** 16-bit operating system.
• **Windows NT** Robust, fully 32-bit operating system from Microsoft. The latest, version 4.0, features a Windows 95 interface.
• **Windows 95** Major improvement to Windows 3.11, with a redesigned interface. Less prone to crashes and easier to use, but requires more memory.

Winsock
Short for "sockets for Windows". The Winsock.dll is an extension for Windows which is necessary for connecting to TCP/IP networks.

World wide web
A 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 get when you print out your work.

Z

ZIF (Zero Insertion Force)
Sockets which are used for large CPUs. Lifting a handle enables you to remove the processor.

ZIP
The common standard for compressing files so that they take up less space. Zipped files have the extension .zip and are compressed and decompressed using shareware utilities such as Winzip and PKZIP.

Buying a Graphics Card

The graphics card sits inside the PC and controls the features which the software can displays on the monitor.

Check the amount of memory on the card. 2Mb is 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 interface.

PCW Recommended products

Graphics cards

ATI Video Xpression: **ATI Technologies 01235 833666;** around £175 (see Graphics Card group test, *PCW* June 1996)

Matrox Millennium: **Matrox 01793 441144** £150

VideoLogic GrafixStar 600: **VideoLogic 01923 260511** from about £150

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Buying a **Monitor**

Regardless of your computer application, you'll be looking at your monitor all day, so make sure you get a good one.

Some people claim not to see monitor flicker, but your brain does, resulting in fatigue and headaches. A refresh rate of 70Hz or higher will produce a flicker-free image on most monitors.

Interlacing also results in flicker. Always run in non-interlaced modes and ignore interlaced quotes. The resolution refers to the number of dots (pixels) horizontally and vertically on-screen. Standard VGA mode runs at 640 x 480 pixels, while other typical modes include 800 x 600 and 1,024 x 768. The more pixels, the more you'll be able to fit on screen, but everything will be smaller and may only be suitable on a larger screen. Go for a 15in or 17in monitor capable of running a resolution of 1,024 x 768 non-interlaced at 70Hz or higher. The visible area of most monitors (and TVs for that matter) is smaller than the model implies: a 15in screen may only have a 14.5in visible area, and a 17in may have only 16in visible.

•PCW Recommended products

- For a 15in screen: try the CTX 1569MS (around £300) or the NEC M500 multimedia **CTX 01923 818461 NEC 0181 993 8111** (around £410 on the street).
- At 17ins there's the Sony 17sfII or the Taxan Ergovision 730TCO-S at around £500 **Taxan 01344 484646** (*PCW* July 1996).

Buying a **Sound Card**

You need one of these to add sound capability to your PC.

Check compatibility with your CD-ROM drive, and remember that 16-bit cards capable of 44KHz provide higher-quality sound than slower 8-bit cards. Better soundcards now include wavetable synthesis which means they have samples of real instruments held in ROM.

The quality of wavetable synthesis still varies widely. Even cheap cards which have the inferior Frequency Modulation synthesis should have a daughterboard connector allowing them to be upgraded to wavetable. The newer cards are also plug and play which means, in theory, that you should be able to plug them straight into a PC without any extra configuration. Most cards are bundled with extra software, normally sequencers, wave editors and audio players.

•PCW Recommended products

AWE-32: **Creative Labs 01245 265265;** £199 (*PCW,* April 1996).

Aztech SoundGalaxy Waverider Pro: **Aztech 01734 814121;** £79 (*PCW,* April 1996).

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No-nonsense Buyer's Guide

Buying Software

Only a few years ago there were dozens of different software applications in each category. During the last two years or so, however, there has been rapid product consolidation. Other magazines list large numbers of packages, most of which are out of date and not worth considering. We've distilled each category down to just one or two recommended products.

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.

B

■ BROWSER Programs used to navigate the internet. A modern browser lets you navigate web pages, download files and send and receive email.
Recommended products: There are only two worth talking about: Netscape Navigator and MS Internet Explorer.

C

■ CAD SOFTWARE Computer Aided Design covers everything from architectural drawings through office planning to complex engineering drawings.
Recommended products: AutoCAD is the industry standard but we think MicroStation 95 is a more capable product at the high end. At the cheap end, DesignCAD 3D offers astonishing value for money.

■ CONTACT MANAGERS (see PIMs)

D

■ DATABASE At its simplest, an electronic card index. For just a few hundred names and addresses, an electronic-type Filofax such as Lotus Organizer may be more appropriate. But for more sophisticated applications like tracking products and customers, the power of a relational database is required. Databases are generally the least user-friendly of the main suite applications. In most offices you are likely to use a database application that somebody else has written for you.
Recommended products: Lotus Approach, Microsoft Access.

■ DESKTOP PUBLISHING SOFTWARE (DTP) This is software used to create newsletters, magazines, books, brochures or adverts.

Typically, it allows you to incorporate graphics, lay out text in multiple columns and to run text around graphics. You also have control over how text appears including the leading (pronounced ledding) which is the space between lines of text and kerning, which is the space between individual letters.
Recommended products: The high-end market leader is Quark Xpress on Macintosh. On the PC, Pagemaker is strong. For serious work on a budget we recommend Serif Publishing Suite and for sheer ease-of-use Microsoft Publisher.

■ DRAWING SOFTWARE Programs for drawing, 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, FreeHand 5 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 products: For simple image editing the popular shareware program Paintshop Pro is fine. For professionals, Adobe's Photoshop is the industry standard.

■ INTEGRATED PACKAGES Typically these combine the functionality of a database, word processor and spreadsheet in one application. This makes it easy to move data from one component to another, but integrated packages tend to lack some of the advanced features of individual applications.
Recommended product: Microsoft Works.

■ MULTIMEDIA AUTHORING TOOLS Programs designed for producing interactive multimedia applications, typically for training applications or for CD-ROMs. The software lets you control and manipulate different types of media like sound files, audio files, video clips and graphic files.
Recommended product: Macromedia Director, the product used to produce *PCW*'s cover-mounted CD-ROM, gets our vote.

O

■ OCR SOFTWARE Optical Character Recognition software converts printed text into computer text you can edit. You will also need a scanner or fax card to get the printed text onto your PC. OCR saves re-keying documents and can cut down drastically on paper filing systems.
Recommended products: Omnipage is the best product we have found, but TextBridge offers most of the same capabilities for less cash.

P

■ PERSONAL INFORMATION MANAGERS (PIMs) PIMs are an electronic way of storing names, addresses, phone numbers and appointments. Contact managers take the idea one step further to include business information about dealings with clients.
Recommended products: Sidekick 95 and Organizer are excellent PIMs. For contact managers we recommend Goldmine for Windows.

■ PRESENTATION GRAPHICS Increasingly the trend is towards doing presentations on a PC and the latest packages tackle this by including sound, sophisticated transitions between slides and support for video clips.
Recommended products: Powerpoint and FreeHand are both capable products sold with Microsoft Office and SmartSuite respectively.

■ PROGRAMMING TOOLS Applications designed for writing software. These range from "low-level" languages which are powerful but difficult to learn and use, to "high-level" languages which, although much easier to use, generally sacrifice performance and flexibility in the process.

Commercial programs like Word for Windows are written using low level languages. Bespoke applications and prototypes are often written using Delphi or Visual Basic.
Recommended products: Delphi 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 PACKAGES 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 product: Quicken is the outstanding product in this category and has no serious rivals.

■ PROJECT MANAGEMENT Programs for managing large projects. Anything from building a power station to planning a marketing campaign.
Recommended products: SuperProject 4.0 for Windows

R

■ REMOTE CONTROL SOFTWARE Software which lets you access and control a PC remotely, usually by 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.Excellent graphing and charting facilities are included nowadays.
Recommended products: Lotus 1-2-3, Microsoft Excel.

■ SUITES Most general business software (word processors, spreadsheets, presentation graphics packages) is now sold in suites.

Two suites are widely available: Lotus SmartSuite and Microsoft Office. Lotus SmartSuite also contains a database.

For Microsoft Office, you pay extra for Office Professional which contains Microsoft's Access database.
Recommended product: Microsoft Office is close to the industry standard. Its high level of integration gives it the edge over the opposition.

V

■ VISUAL PROGRAMMING (see Programming Tools).

W

■ WEB EDITORS Programs designed to do for web page design what DTP did for magazines and newsletters. They allow you to create web pages without manually writing HTML. You can also incorporate graphics, backgrounds, tables, images and sounds into web pages.
Recommended products: HotMetal Pro 3.0 is our first choice. Adobe Pagemill is a capable alternative.

■ WORD PROCESSOR An application in which you can write letters and prepare reports, or even produce a simple newsletter.

The latest word processors have advanced features such as outliners, table editors and facilities for adding columns of figures.
Recommended products: Microsoft Word is the clear market leader. WordPro (formerly AmiPro) is a capable alternative.

■ *If you want to obtain any of the reviews listed and do not have the original issues, order PCW on CD-ROM. It costs just £9.95 (including postage and packing).*
See pages 20/21.

A-Z of Recommended **Software Products**

	Category	Product	Supplier	Contact	Price (ex VAT)	Date of *PCW* review
A	Accounts	Lakeview LM3	Lakeview Computers	0181 303 3329	£8,750	Jan 1996
	Accounts	Exchequor	SBS Financial Systems	01202 298008	£5,980	Jan 1996
B	Browsers	Netscape Navigator	Netscape	0181 564 5100	£49	Mar 1997
	Browsers	Internet Explorer	Microsoft	0345 002000	Free	Jun 1996
C	CAD	Microstation	Bentley	001344 412 233	£3,495	Jan 1997
	CAD	DesignCAD 3D	BVG	01874 611 633	£149.95	Jan 1997
D	Database	Approach	Lotus	01784 455445	£99	Nov 1996
	Database	Access	Microsoft	0345 002000	£220	Nov 1996
	Desktop publishing	XPress 3.3	Quark	01483 454 397	£795	Apr 1996
	Desktop publishing	Publisher	Microsoft	01734 270 000	£70	Apr 1996
	Desktop publishing	Publishing Suite 3.07	Serif	0115 942 1502	£99	Apr 1996
	Drawing	Freehand 5	MacroMedia	01344 761111	£450	Apr 1996
	Drawing	Designworks 3	GSP	01480 496789	£39.95	Apr 1996
I	Image editing	Photoshop	Adobe	0181 606 4000	£382	Dec 1996
	Image editing	Paintshop Pro	Digital Workshop	01295 258335	£49.95	Jun 1995
	Integrated package	Works	Microsoft	0345 002000	£79.99	Oct 1995
M	Multimedia authoring	Director 5.0	Macromedia	0181 200 8282	£99	Oct 1996
O	OCR	Omnipage	Caere	0171 630 5586	£595	Nov 1995
	OCR	Textbridge	Xerox Imaging Systems	01734 668421	£349	Nov 1995
P	Personal finance	Quicken	Intuit	0800 585058	£39.95 (Incl VAT)	May 1996
	PIM/contact manager	Organizer 2.1	Lotus	01784 455445	£99	Mar 1996
	PIM/contact manager	Goldmine for Windows	Elan Software	0171 454 1790	£395	Mar 1996
	PIM/contact manager	Sidekick 95	Starfish UK	0181 875 4400	£39	Mar 1996
	Presentation graphics	Freelance	Lotus	01784 455445	£415	Nov 1996
	Presentation graphics	Powerpoint	Microsoft	0345 002000	£220	Nov 1996
	Programming tools	Visual C++	Microsoft	0345 002000	£379	Feb 1996
	Programming tools	Delphi 2.0	Borland	01734 320022	£249	Feb 1996
	Project management	SuperProject 4.0	Computer Associates	01753 679679	£495	May 1996
R	Remote control	Reachout	Stac Electronics	01483 740763	£110	Nov 1995
S	Spreadsheet	Excel	Microsoft	0345 002000	£220	May 1995
	Spreadsheet	1-2-3	Lotus	01784 455445	£365	May 1995
	Suite	Office (Standard)	Microsoft	0345 002000	£360	Mar/Dec 1996
	Suite	Office (Professional)	Microsoft	0345 002000	£460	Mar/Dec 1996
W	Web authoring	HoTMetal Pro	SoftQuad	0181 236 1001	£99	Oct 1996
	Web authoring	Fusion	NetObjects	(US) 415-482 3297	(US$695)	Jan 1997
	Word processing	Word	Microsoft	0345 002000	£220	Oct 1996
	Word processing	WordPro (AmiPro)	Lotus	01784 455445	£99	Oct 1996

News

Doctor's orders

If you have ever had the urge to be a hospital administrator, then Theme Hospital, the successor to the 1.5 million selling Theme Park, could be just what the doctor ordered.

As an administrator, you must design, build and run your hospital in the most profitable and efficient way possible. If you find you have unhappy patients, why not cheer them up with strategically placed plants? Or you can put a drinks machine in the holding room for patients waiting for treatment. Don't forget to build those toilets, though…

The better you do, the higher up the career ladder you go until you are the best hospital administrator around.

Theme Hospital is designed to run on any PC from a 486/50MHz with low-resolution monitor to any new PC with standard high-resolution monitor. It will be released on 31st March.

■ **Bullfrog Productions 01483 579399**

Creepy crawlies

Grolier Interactive has announced the forthcoming release of Banzi Bug, its new, quirky 3D flying game. Banzi is the young, hip hero who's trapped in a house full of crazy characters, ranging from a lusty spider to nasty fly-killing humans. As Banzi, your job will be to fly around the house and survive all the trials and tribulations that come your way. The game incorporates Microsoft's DirectX technology and will be available for Windows 95 in mid-April.

■ **Price: £29.99 Contact: Grolier Interactive 01865 264800**

Three's company

Europress has re-released three successful titles in a three-game bundle called Total Insanity. For £49.99 you get Europress' Rally Championship, Microprose's Star Trek — The Next Generation: A Final Unity, and Electronic Arts' PGA European Tour.

■ **Europress 01625 859333**

Charts

1	Cool Boarders	Sony	PlayStation
2	Destruction Derby 2	Psygnosis	PlayStation
3	Command & Conquer: Red Alert	Virgin	PC CD-ROM
4	Victory Boxing	Virgin	PlayStation
5	Die Hard Trilogy	EA	PlayStation
6	Tomb Raider	Eidos	PlayStation
7	Tomb Raider	Eidos	PC CD-ROM
8	Championship Manager 2: Double Pack	Eidos	PC CD-ROM
9	Dark Forces: White Label	Virgin	PC CD-ROM
10	Soviet Strike	EA	PlayStation
11	Diablo	Ablac	PC CD-ROM
12	Flying Corps	Empire	PC CD-ROM
13	Secret of Monkey Island 1&2: White Label	Virgin	PC CD-ROM
14	FIFA '97	EA	PlayStation
15	Sega Rally	Sega	PC CD-ROM
16	Tekken 2	Namco	PlayStation
17	Tie Fighter: White Label	Virgin	PC CD-ROM
18	Command & Conquer	Virgin	PlayStation
19	NBA Live '97	EA	PC CD-ROM
20	Worms United	Ocean	PC CD-ROM

Tomb Raider

3D thrills, with a feisty female hero fighting her way through fiends and foes. Great viewpoints.

Tomb Raider is a 3D game with a refreshing difference: you are Lara Croft, a hard-edged female version of Indiana Jones. Your mission is to penetrate an ancient tomb to retrieve the mystical Scion.

Lara is one tough lady you wouldn't want to double-cross!

Your journey starts in the Caves where you encounter shooting wall-darts, nasty attack-bats and vicious wolves. Luckily you're packing two Colt .45s, so you can blast your way out of some tough scrapes. You'll need to hunt around for special items, door keys, better weapons and secret chambers.

As you progress through the tomb to higher levels, like the City of Vilcabamba, you'll need to sharpen your skills and practice your breast-stroke — Lara has to do a lot of swimming here. The higher you go the more dangers you find, like prehistoric dinosaurs with big appetites.

The most unique feature of the game is Lara's zoom-around camera viewpoint. This aspect of the game is brilliant. As you make her walk, run, jump and swim, it feels as if you were following her with a hand-held video camera. But you'll need a lot of Pentium power to get the most out of the game. It ran fine on a Pentium 150MHz with 32Mb RAM, but it struggled somewhat on a Pentium 120MHz with 32Mb RAM.

Dylan Armbrust

PCW Details

Price £39.99

Contact Eidos Interactive 0181 780 2222

System Requirements MSDOS 5.0 or higher, or Windows 95, Pentium 60MHz (Pentium 90 recommended), 8Mb RAM, 20Mb disk space, dual-speed CD-ROM, SVGA graphics card, 16-bit sound card.

★★★★★

Flying Corps

Join the Brylcreem boys and hunt the Hun in this accurate WWI dog-fight simulation, what!

At first sight, this WWI flying simulation looks the business: plenty of dashing mustachioed heroes leaping into their crates and yelling "Chocks away! Let's get this kite into the air!". But the reality of life as a fighter pilot was grim, so Flying Corps' *raison d'être* is realism: attention to detail, authentic aircraft performance and accurate landscapes are recreated, and different levels of flying skills are available.

Got to shake that cunning Fokker off my tail

The landscape detail is impressive, but when running on a 133MHz Pentium with 32Mb RAM it is a little jerky and occasionally the action stops completely for a second or two, which is particularly annoying if you are in the middle of a dogfight. You can take any of six aircraft for a spin and engage in four campaigns: two as a German and two as an Allied flier. There are opportunities to command your own squadron, formations and tactics. The manuals do a superb job of setting the scene for the campaigns and are full of interesting historical information as well as advice from pilots who flew during the war.

Flying and landing the planes is fairly easy, but navigating and fighting other aircraft can be tricky. Attention to detail is impressive, but it takes a lot of time to learn the basics before you can do anything worthwhile. The manual recommends climbing to several thousand feet and spending time familiarising yourself with the French landscape; not my idea of a good time. If you're a dedicated flight-sim fan you'll get a lot from this game. Others may be put off by the amount of effort involved.

Adam Evans

PCW Details

Price £44.95

Contact Empire Interactive 0181 343 9143

System Requirements 90MHz Pentium (133MHz recommended with 512Kb secondary cache), 16Mb RAM, 5Mb hard disk space (20Mb recommended), four-speed CD-ROM drive. Runs under Windows 95 and DOS.

★★★

p506

Master of Orion 2

More megalomaniac mastery of the galaxy in this challenging sequel to Master of Orion.

If you want to be in charge of mighty armies and rule the galaxy, one of the most successful games and one of the better titles in this genre is Master of Orion. And now, the long-awaited sequel, Master of Orion 2 — Battle at Antares (or MOO2) is here.

It boasts SVGA graphics, multi-player options and works under Win95 and DOS, but lacks the multimedia pizzazz of contemporary games.

You are controlling the fate of the galaxy, so don't spend all your money in one place

There are almost no video clips. The battle sequences are visually unappealing and the sound effects and music quickly become monotonous. Nevertheless, MOO2 offers new options at almost every level. Some, like multiple colonisable planets at each star on the map, seem to add complexity without helping the gameplay, yet others have clearly been added after much testing and feedback from gamers. For instance, in the original game you could amass huge starfleets, which made it hard to keep track of all your ships, and the battles were rather impersonal. Now ships cost more and there are strict limits to the number an empire can control, so losing even one battleship can be a serious blow.

Even with greatly improved online help it can take weeks of play before you feel you have mastered it. But if you're after a real challenge, few games can match MOO2.

David Brake

PCW Details

Price £34.99

Contact Microprose 01454 893893

System Requirements 486/DX100 or better (Pentium recommended), 8Mb of RAM (16Mb with Windows 95 recommended), double-speed CD-ROM, 75Mb of free HD space, SVGA graphics card, 16-bit sound card.

★★★

Toy Story

Woody & Co. in a charming children's game.

This nice little video game would make an ideal gift for children. The colours are bright and cheerful, Woody's comical expressions and gesticulations revive both the character and the story, and the screen is full of exciting toys.

It is easy to install and the task of getting to the top (seventeenth) level becomes increasingly difficult yet never unmanageable. It's a good game to promote skills development, as each new level demands a higher degree of concentration and a new trick in order to crack it. The manual offers hints but progress depends on your own observation, curiosity and co-ordination. The tasks are fun and range from dodging, to combat, to steering "RC Car": not too difficult, but some persistence is needed.

I appreciated the level of choice available: if you are stuck it's nice to have alternatives such as higher shelves to explore or different escape actions to use. Although the story screen beginning each level sets the scene well, it lasts nearly two minutes: thankfully you can turn it off before making successive attempts at the same level.

Come on, Mr. Potato Head — have a go on the bouncy ball!

The sound effects are fun. My favourite is the tinkly sound emitted when Woody nabs those omnipresent little gold stars. I would have liked more audio expression of his many deaths, though. He gets savaged by sharks and bumped off (literally) by clowns, but the game doesn't provide different sounds for these events.

Toy Story would appeal to the eight- to twelve-year-olds who still take toys and picture-book adventures seriously, and can concentrate enough to become engrossed in the gameplay.

Sinéad Carew

PCW Details

Price £34.99 (Incl VAT)

Contact Disney Interactive 0171 341 5505

System Requirements DOS 3.3 or higher, Microsoft Windows 3.1 or 95, 8Mb hard disk space, 8Mb RAM (16Mb recommended), 8-bit soundcard (16-bit recommended), VGA graphics adaptor, double-speed CD-ROM, gamepad or joystick.

★★★

A rainbow warrior

Simon Rockman remembers the colourful advent of the ZX Spectrum, then the most important computer launch in the UK.

In June 1982, with the bold headline "World Exclusive: ZX Spectrum. We Benchtest Sinclair's new 16k colour micro", *PCW* broke a news item that was so momentous our cover illustration had to be re-shot — a chimpanzee with an artist's palette replaced a man parachuting with a Sharp pocket computer. The chimp was chosen as a follow-on from the ZX-81 cover that had featured a similar simian. The colour palette was chosen because, back then, colour was still a pretty new feature for a small computer.

The hype was understandable because, at the time, the Spectrum was probably the most important computer ever launched in the UK. The BBC Micro might have been a planned attempt to make the country computer literate, but it was the Spectrum which succeeded. In 1982, more people were programming in bedrooms than today.

The price was a lot less than we would expect to pay for a computer now: £125 for the 16K model and £175 for the one with lots of memory, i.e. 48K! In years to come, Alan Sugar was to refer to it as a "pregnant calculator" but in 1982 it was very special. The size of a hardback book but not as heavy, it broke new ground for Sinclair by having actual press-down keys on the keyboard.

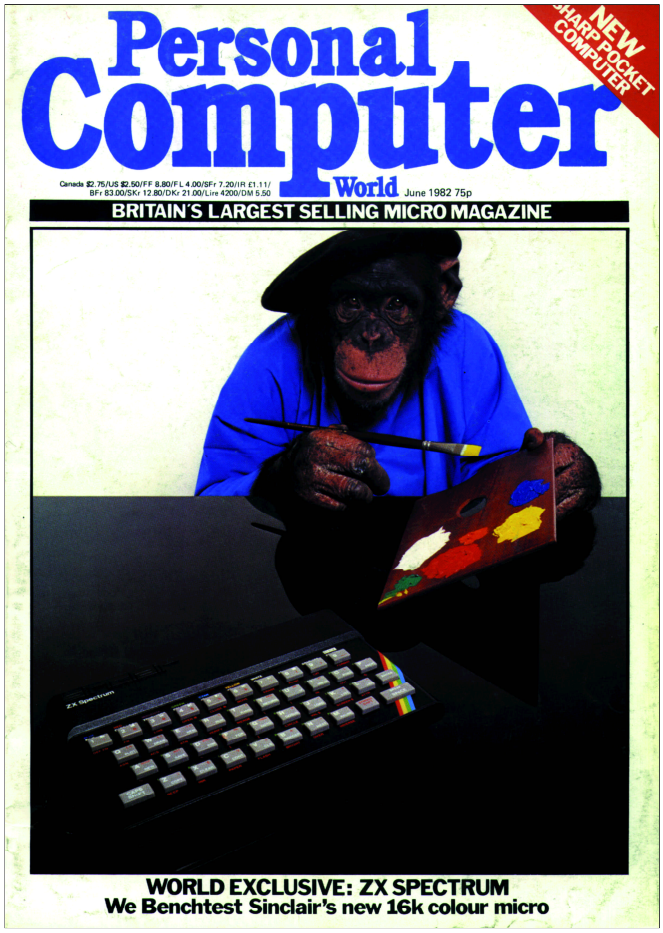
The original *PCW* review praised the Spectrum for having all the possible signals on the edge connector. This may have been a result of Sinclair not knowing what would be needed, but it was wonderful for all those third-party programmers who grew up around the machine. Many fortunes were made from building add-ons for the Spectrum.

I've heard it said that if every component in a Spectrum only just worked to its specification, the machine would have failed: it relied on components being better than the manufacturers guaranteed. The Uncommitted Logic Array (ULA) certainly became very hot on the machine David Tebbutt tested 15 years ago. He also noted that the keyboard, with its multitude of functions on each key, was confusing and you had to look at pretty much every key to find the one you wanted.

For the day, the graphics were great. A resolution of 176 x 256 pixels was offered although colours were limited to the same resolution as text, with 24 lines of 32 characters, so graphics were best limited to monochrome. There was a choice of eight colours, which was seen as being very special. In addition to the software, which allowed lines to be drawn from one point to another, the Spectrum offered user-defined graphics. So, if your game didn't use the % symbol but did need a picture of a bomb or an alien craft, you could define one of your own within the 8 x 8 grid of a letter. All this could be done using the Basic programming language.

The review praised the machine for having a comprehensive Basic interpreter. It's something of a backward step that machines no longer come with a programming language as standard. Back then it was assumed that you'd be programming, and the strict program editor which inserted spaces was good for encouraging proper style.

The delays between launch and delivery were part of the Sinclair legend; in part, the advance payments for machines financed the production engineering and this led to much bad feeling. The result was a huge pent-up demand for software when the machines did arrive.



One of my favourite Sinclair anecdotes involves Andrew Glaister. He wrote the program for the game Orbiter on paper, using only gleaned information, while waiting for the machine to be delivered. When his early Spectrum arrived he typed in his machine code program but couldn't figure out how to do sound from Assembler, so each time an alien was shot or an explosion was needed, the program popped back into Basic and played the appropriate sound. It was good enough, and the game sold thousands of copies.

For all its praise, the review was realistic enough to point out that the Spectrum was a home machine designed for plugging into a TV. This was long before the advent of disk drives that helped make PCs useful for many other things, but in those days it was perfect for just monkeying around. ■

Brainteasers

Quickie

The idea for this Quickie came to me on New Year's Eve. If a missile were launched at midnight on 31st December 1996 and it travelled towards the sun at a constant speed of one mile per second, would it get there before the millennium, January 2000, assuming it didn't burn up and that it could get beyond the earth's gravity?

This Month's Prize Puzzle

When I was a boy, I had a toy which consisted of a series of hollow open-ended cubes of increasing size which fitted inside each other, in much the same way as Russian Dolls do. The side of each cube was an exact number of centimetres with the edge of each successive cube being one centimetre larger than its immediate predecessor. You could use them as building blocks and they could be stored away in the toy cupboard in the space required by the largest box only.

■	2	5	7	8	3	6	8	8	■
8	9	2	8	3	2	5	9	■	1
8	5	■	6	5	4	4	0	4	8
9	6	9	9	2	1	■	8	4	3
9	1	3	5	■	2	3	6	5	4
■	9	9	1	3	■	1	1	9	5
6	9	5	x	2	2	8	9	4	7
3	7	8	2	7	4	9	■	6	8
1	■	1	6	0	3	9	4	3	8
■	6	3	6	0	3	0	2	2	■

The toy was called "The (n+1) Cubes" (I won't tell you what n was) and I could never understand why, since there were only n cubes. I thought one must have been missing, but it wasn't until later when I became interested in mathematical puzzles that I realised where the (n+1)th cube came into it. The sum of the volumes in cubic centimetres of all the boxes was itself a perfect cube! I can't remember the dimensions of my boxes, but I do recall there were two ways in which that number (n) of boxes could have been produced to meet the stated requirement.

How many boxes were in the set? For the benefit of any pedants that might attempt this problem, my toy cupboard was just an ordinary cupboard and not an aircraft hangar! Send the solution to: *PCW* Prize Puzzle April 1997, P.O. Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20th April 1997.

Winner of Jan '97 Prize Puzzle

As usual with the annual number puzzle, we were swamped with entries. The winning card, chosen at random, came from Mr M Mitchell of Winchester who gets our congratulations now and a prize shortly. The winning solution is shown. Meanwhile, keep trying, you could be the next winner.

JJ Clessa

Computations

Oil giveaway

Nearly all the oil pumped out of the British Isles has been during a Conservative government. It started flowing in big quantities in 1976. Since 1979 we've used 7.5 thousand million tonnes. That's 75,000 supertankers (gone forever).

While we burned off that vast treasure, taxation on the resource was reduced. Those pumping the oil, mostly foreign-owned transnationals, are paying less than half the royalties they were when this government came to power, when consumption and prices were comparable (£6,000m adjusted/£2,300m). The tax picture is strange. Individuals on average earnings pay over thirty percent of their profits in tax and National Insurance. Companies pumping out British oil and gas are meant to pay about the same, but actually pay about 6.5 percent on their gross profits.

If those so-called global companies actually paid the same rate as most people in Britain on a typical year's profits of £13 thousand million, it would add £4 thousand million a year to national revenue. This would exceed the annual revenues from the National Lottery, by more than three times.

■ Source: Gross oil and gas production half-year profits: £6.584 billion (£13.168bn pa). Deductions allowed before taxation: £5.952 billion (£11.904bn pa). Tax paid: £424 million (£848m pa). Inland Revenue (June-Dec 94). Lottery contribution last year: £1.2bn.

Sunny places for shady people

We hear a lot about social security fraud, but we hear little about tax evasion by UK businesses, a practice which multiplied 16 times in value in a decade.

A circular promoting a City conference offers to tell Britain's 100,000 accountants about methods of "getting the taxman to pay the mortgage". Then there's the never-never land of cyberspace, brought to us by computerisation. It was recently revealed that News Corporation paid little UK tax. In bureaucracies you can pass the buck and avoid not only taxes, but responsibility too.

Clever directors have their money-laundry abroad: the Isle of Man, Jersey, Gibraltar, Luxembourg and Switzerland's corrupt canton of Vaud. British money's sunny place is the Cayman Islands, which is much smaller than the Isle of Wight, with one-fifth its population. Its residents are British subjects but not payers of UK tax. Cayman Islands has 546 banks, over twice as many as London (213). Along with the British Virgin Islands, it has the offices of 100,000 companies. Compared with more than a million UK companies, that's about one-in-ten for each company registered in Britain, and so British taxes are avoided.

Be sure the pence-in-the-pound taxation debate in the British general election is of minimum concern to persons using these financial facilities in the sun.

■ Source: HM Treasury/Cayman Islands High Commission. Nominee tax-avoidance and money-laundering companies lodged in the Virgin Islands, 65,000: in the Cayman Islands, 34,000; BBC News & Current Affairs. Tax dodgers form 10,000 secret companies a year in the British Virgin Islands. Secret companies registered in the Virgin Islands in 1986, 5,000: in 1992, 65,000.

Rowland Morgan

Win a Panther P166+

Looking for a new pet? Thinking of getting that cute little kitten? Well, why not go for a Panther? In this month's *PCW* competition we have two to give away. Roldec is offering two complete Panther multimedia P166+ PCs as top prizes.

The Panther 166+, worth £923, is the perfect high-performance PC for home or office. With a Cyrix P166+ processor, 16Mb RAM, 512Kb cache, eight-speed CD-ROM, 1.2Gb hard drive, 16-bit sound card, 128-bit graphics card and 14in monitor, you won't have any trouble running that accounting package or blasting your way through a cyber-galaxy.

There's plenty of expansion space if you have the urge to upgrade. With three PCI slots, four ISA slots (one shared, one PCI populated) you'll have plenty of room to fit in a modem card, TV tuner add-on or whatever you please.

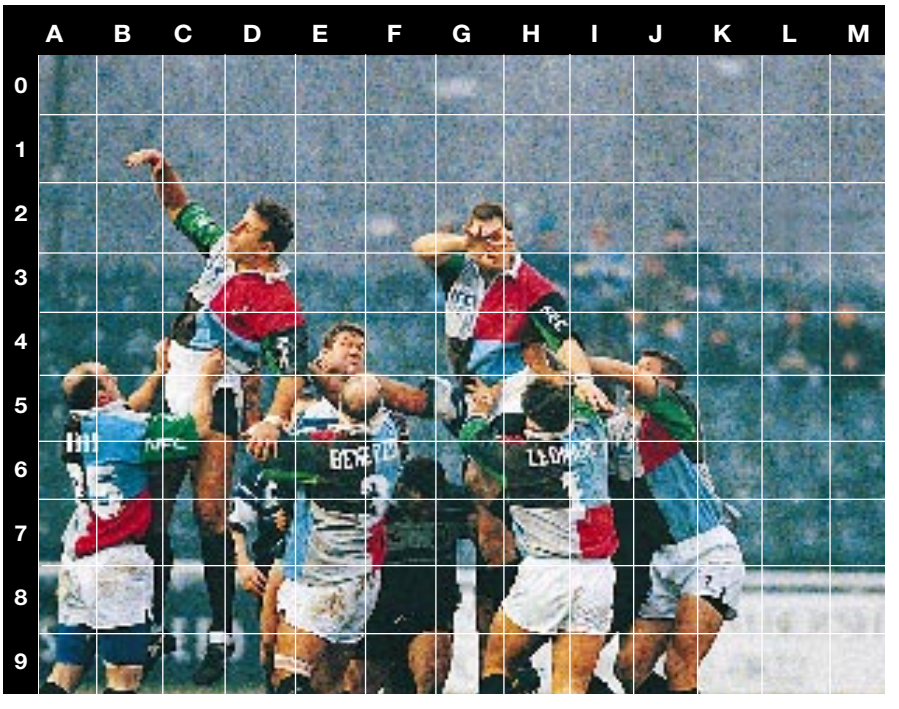
But that's not the whole package. Roldec is also including a two-year return-to-base warranty for parts and labour plus an additional three years warranty for labour. So you'll be able to rest easy regarding those "just in case" thoughts.

If you want a chance to win a Panther, here's where you can do it.

Roldec®
computers for people

All you have to do is enter this month's competition, either by post or through our web site, and the Panther could be yours.

Just spot the ball in the photograph below. Please do not mark a cross — just tell us what the grid co-ordinates are.



How to enter

Send your grid co-ordinates, with your name, address, and daytime telephone number, to: *PCW* April Competition, P.O. Box 11312, London WC2H 0DJ. Alternatively, enter the competition via our web site at www.pcw.vnu.co.uk. ***Please do not send direct email.*** Entries must arrive by 18th April 1997.

If you do not wish to receive promotional material from companies other than VNU Business Publications, please say so on your competition entry.

Rules of entry

This competition is open to readers of *Personal Computer World*, except for employees and their families of VNU Business Publications and Roldec. The Editor of *Personal Computer World* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.

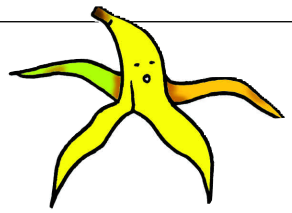
p517 ➢

p519 ➢

Product Locator

p521 ➢

ChipChat



Oops!

■ In last month's Palmtops group test we inadvertently used the term "biro" as a generic term to describe a ballpoint pen. Biro Bic has informed us that the term "biro" must, in fact, be "Biro" and should only be used in connection with ballpoint pens… er, Biro ballpoint pens. We apologise for any confusion caused to our readers.

Microsoft boob

We've heard of support, but it looks like Microsoft has gone too far this time. It seems that Asda is now selling a "microsoft" bra! Inside sources say that Microsoft is aiming to "lift and separate" instead of "embrace and extend" for this particular product line.

There are, however, concerns over the potential confusion of product lines between Microsoft's Visual C++ programming package and the new microsoft C-cup bras. It has been said that programmers might confuse the microsoft bras with the old programming interface and attempt to get hands-on experience. One can only hope that they read the manual first before trying them out.

Caption competition

"If only we had British Rail in the States."

Congratulations to Alan Aldous who won February's caption competition with this:

"It's up to you — give me ten million or I play track 13 of Barry Manilow's Greatest Hits."

Think you can do better? Then email captions@vnu.co.uk, enter via our web site, or write to the usual *PCW* address with your own captions on a postcard marked "Caption Compo", before 15th May. We'll print the funniest entry and the winner will receive a £20 book token.

Ear ear!

Following a blistering Micrografx press conference for Graphics Suite 2, a certain freelance (who shall remain nameless) was seen chatting with David Whitewood, the youthful and earnest UK general manager. Nothing wrong with that, apart from the fact that the said freelance seemed to have a somewhat eccentric habit of sticking the arm of his spectacles in his ear. During the conversation he had a good old dig around until he had prised out the offending lump of wax, took a look at it, wiped it off and replaced his glasses, continuing to chat all the while.

Either Mr Whitewood somehow failed to notice, or was so taken aback by this public display of aural excavation that he was simply rendered speechless, rooted to the spot. All credit to him for remaining professional enough to appear undaunted throughout the entire unsavoury episode. What a guy!

Travel sickness

PCW's own features editor, Gordon Laing, sadly appears to be £30 out of pocket due to a rather unfortunate experience on the railway.

Last month, Mr Laing was invited to visit the Sony plant in "sunny Weybridge" (his description). Ever eager to see yet another factory assembly line, he dashed rather belatedly to Waterloo station to catch the 17:20. On arrival at the station he approached the ticket office and asked for a ticket to Weymouth (about 120 miles down the line) whereupon he was told that it would cost him £30.

Gordon normally pays £3 for the trip, so, dazed and confused, he questioned the booking clerk about whether the fare to "Weymouth" was indeed £30... Surely it couldn't be this much? The man behind the window answered in the affirmative, and so our poor cash-strapped colleague sheepishly handed over his money and ran for the train.

One can only imagine the feeling of horror when Gordon arrived, just 15 minutes later, at, lo and behold, Weybridge in Surrey, a mere 20 miles down the line. Way to go, Gordon!