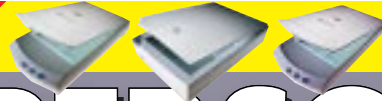


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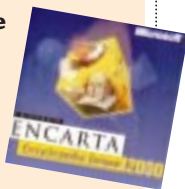
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Most users base their **buying decisions** on others' experiences.

## Run with the pack

**Word of mouth** is what really makes something successful. Whether it's a film, a play or the latest console game – that's the secret ingredient for making anything 'hot' these days. OK, there are hundreds of journalists, critics and shop assistants out there to tell you what they *think* is a damn good car, sound system or TV set. And marketing departments will spend millions putting their brand or product in front of your eyes or near your ears. But nothing is going to make you more confident than hearing that other purchasers fared well.

It's human nature that sometimes we like to run with the pack, no matter how strong our individualism. I'm naturally an individualist, but this summer I did a lot of pack work: I thrilled to the *Phantom Menace*, watched sadly as the Dirty Dan saga unfolded on *EastEnders*, and bought a new Sony MiniDisc machine and a bigger Dyson vacuum cleaner. In each case, I seemed to be doing what most other people were doing, and if everybody's doing it, then you know it must be good. (And if it isn't, then you really have something to talk about!)

**This month, once again**, we invite you to sample a little word of mouth about the best manufacturers to buy from. We invite you to run with the pack by contemplating where the pack is running to buy machines. In our May issue we asked readers to take part in our second annual Service and Reliability Survey and more than 2,300 of you answered that call. So, here are the results of the UK jury...

The pack is running once again to a pantheon of key names: Dell, Dan and Mesh on the systems front; Toshiba and IBM for notebooks; Psion and 3Com for handhelds; and Epson, Hewlett-Packard and Brother for printers.

Not that that's endorsement in itself. There are readers who have had bad

experiences with these companies as well. But for most of the companies that feature in our report, there are at least three or four satisfied customers to every one who has had a problem.

**For most of the companies in our report, there are three or four **SATISFIED CUSTOMERS** to every one who has had a problem**

And therein lies the rub. Our survey doesn't stop at the advice you're given over the phone or in the shop. (Internet purchasing, we note, is still regarded as a minority activity, but that will be a different story in 12 months' time, with the likes of jungle.com prowling the market.) Nor do we stop at the condition of your order when it arrives. Instead, we go on to ask you to assess what happened when something went wrong. How good was the advice you received? How soon were problems fixed? Both pre-sales and post-sales service are a measure of a good company. Because no matter how good a company is, once in a while there will be a cock-up. That's Sod's Law.

**So, the manufacturers** that will wind up ruling the roost are the ones that care not only about providing a good system, but also about making sure the fixes run smoothly in the event that something does go wrong. If, in the words of those great pop philosophers, Simon and Garfunkel, they are trying to keep their customers satisfied, then they're halfway to making word of mouth work for them.

**Bobby Pickering, Editor**

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# READER OFFER

## WHAT THE CRITICS SAY ...

‘Now here **IS** something **amazing**. It is a CD-ROM of the entire electoral register for the UK, cross-referenced to the entire phone directory plus, for good measure, a directory for every business in Britain and the whole country on Ordnance Survey maps [Info Map]. Furthermore, on this one relatively cheap CD [from £39.95] you can search in an instant, rather than ploughing through books for hours. You can even save the extortionate cost of 192 calls. Want to find an old school friend? I located two in a minute. The CD...is pretty **extraordinary**.’

*London Evening Standard, Jonathan Margolis, on UK-Info Disk Version 4.0*

‘Simple and versatile ... Overall: ★★★★★’  
*The Daily Telegraph*

‘Does what it says’  
*Directors Magazine*

A ‘**watershed** in the Information Age in the UK’  
*The Independent*

‘**Top of the list**...This is a worth-while upgrade to all previous versions of the UK-Info, and remains **good value**.’  
*The Guardian*

‘WITH 47 million names and addresses, this is a **formidable** search tool’  
*The Daily Telegraph*

‘Ease of Use ★★★★★ Performance ★★★★★ Features ★★★★★  
Value for Money ★★★★★ Overall ★★★★★’  
*Computer Active*

‘A **sublime** piece of software’  
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# November COVER DISCS

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UK Info Disk can be an extremely powerful information tool. It is designed to allow anyone – be it an individual or many people working in large corporations – to search quickly and easily for contact addresses and telephone numbers, without incurring the mounting costs of repeated calls to the Directory Enquiries service.

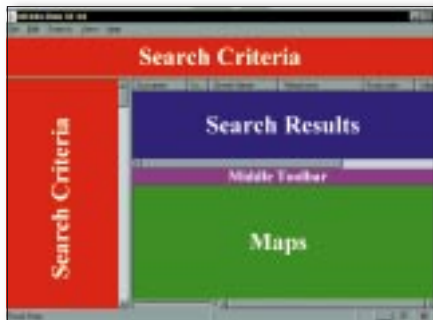
The version featured on our cover disc this month is UK Info Disk 2000 SE, which includes the fully updated 1999 database boasting information on over 42 million UK residents and businesses. But to get the most out of UK Info Disk and produce the most efficient searches, you must master its many intricacies.

Here's our guide to squeezing the best from this nifty product.



## A step-by-step guide

**1** UK Info Disk's workspace is split into three areas: search criteria, search results, and maps. At the very simplest level, you can use the program to search for someone using characters from their surname or postcode.



Imagine you want to catch up with a long-lost friend, for instance, but all you can remember is that they live somewhere in Norfolk. Click in the Surname entry box (in the search criteria area) and type in the name – we're using Smith as an example. Now move to the list of localities in the left-hand pane, scroll down to select Norfolk and then click Start.

**2** After a short while, UK Info Disk will return a list of matches, complete with a summary of information stored in its database. However, you'll notice that they're in no particular order. To sort them by any one of the field names (Initial, Street Name, Town, etc), simply click on the

appropriate field heading at the top of the list. If one of the entries looks like it might refer to the person or company you're after, simply double-click it to bring up a more detailed record.



**3** Using this method is fine for quick-and-simple searches in small localities. However, UK Info Disk 2000 SE limits the number of entries on a list of matches to 30 –

imagine how many people called Smith live in London, for instance, and you can see how this has the potential to cause problems.

The best way around this is to narrow your search by using additional



criteria. Tap the initial of the person you're looking for into the Initial entry box and, if you know all or even part of it, put the postcode into the P.Code entry box. Click Search again.

UK Info Disk keeps track of anything you enter so, as time goes by, you can reduce the amount you have to type for future searches by using entries from the drop-down menus available on all fields – this is particularly handy if you intend regularly searching for people residing in a select number of localities.

**4** One of UK Info Disk's most impressive features is its ability to pinpoint your chosen record's location on a street map – anywhere in the UK! To do this, just select the match from the list as before, right-click with the mouse and select the Show Record On Map option from the pop-up menu. The exact location of the record will be marked by a little figure of a person.



On our cover disc version of UK Info Disk, there is a 30-day time limit on this feature. If you have access to the Internet, it's possible to 'refresh' the counter once by visiting the developer's website at [www.192.com](http://www.192.com) – but you will be expected to register by entering a number of personal details.

**5** If you're doing a number of different searches and want to make a note of a few matches from each one, UK Info Disk's tagging feature can help you out. When your first search is complete, click the Tag/Untag button (it's just below the Edit menu, and looks like a little checklist). Now double-click on each record in the list of matches that you wish to tag; the entries will be highlighted in red as you do this. Now perform your second search, and repeat the tagging procedure. When you've finished, you can view all the tagged records by



clicking on the Tagged tab at the bottom of the list.

Records can be untagged by simply clicking on them in the main search results list (click the Results tab to return to this).

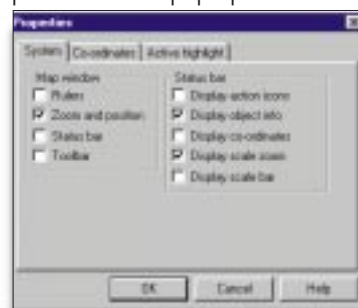
**6** So far, we've confined our searches to individuals, but UK Info Disk is just as good at searching for businesses. To start with a clean slate, click the Reset button (it sits just under the File menu, and looks like a little sweeping arrow). Type all or part of the company's name into the Company entry box,

and then select its locality as per step one – we're looking for VNU Business Publications, the publisher of PCW.

As with people searches, you can plot the location of the target business on a street map by right-clicking its entry in the results list. The only difference here is that the business' location is marked with a pound (£) symbol, rather than the person icon seen before.



**7** Displayed map information can be tweaked to your heart's content, too. Right-click anywhere within the map area and select Properties from the pop-up menu. For an idea of scale, you might want to turn on the rulers; or perhaps you'd like to pinpoint precise locations using British Ordnance Survey co-ordinates. The best bet here is to simply experiment with the various options until you're happy.



**8** UK Info Disk is closely integrated with the Windows Phone Dialer applet. If your PC is fitted with a voice modem, you can use the Phone option from the File

menu to have UK Info Disk automatically dial the number of your selected record. With a little bit more effort, you can even set Phone Dialer up with a number of 'speed' dials – one-touch shortcut buttons to your 10 most-dialled contacts – just select Speed Dial from the Edit menu and follow the on-screen instructions.



**9** Finally, UK Info Disk's display can be configured just like any other Windows application. If you want to make the map area much larger so that you can see more detail, click and hold down the mouse button on the window separator and just drag it to the required size. You can alter any of the other windows in exactly the same way.





# Lotus SmartSuite 97



This month we bring you the complete professional office suite – Lotus SmartSuite 97. It's a full version and includes everything you need to run your office. Please install from the English Folder – foreign language options are not available.

Taking a quick head count, we have Word Pro processing the words, 1-2-3 on spreadsheet duties, Approach directing databases, Freelance Graphics creating business presentations and Organizer managing personal information – all fully 32bit applications. There's also Lotus ScreenCam, a tool to record videos of screen actions for training or demonstrations.

Here's a quick tour through some of the special features in Lotus SmartSuite 97.

## Lotus 1-2-3 97

As well as the full range of professional spreadsheet functions, the 32bit 1-2-3 includes powerful database capabilities and a set of sophisticated charting and graphics features. Files can be saved or loaded in all the common formats, so compatibility will never be an issue.

In common with the other components of the suite, the Internet and intranets are on tap via a set of SmartIcons. You can also open or save documents on the web, or publish them as a standalone HTML file.

New to this version of 1-2-3 is an outlining feature that lets you collapse or expand ranges of data.

## Word Pro 97

This goes way beyond the standard word processing features you'd expect from a

top professional word processor. A powerful DTP (desktop publishing) capability makes Word Pro 97 ideal for creating everything from newsletters to web pages. Its close integration with the rest of SmartSuite 97 also means that it is easy to link elements from all the modules.

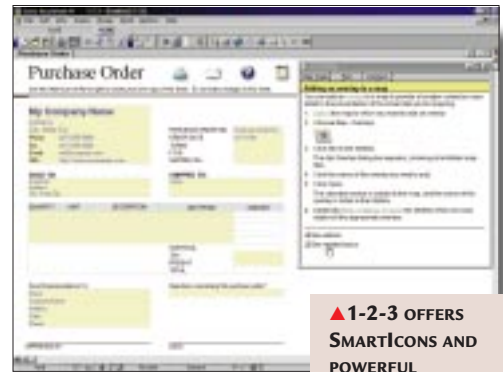
## Net with everything

Lotus had a headstart over Microsoft with the first version of SmartSuite offering web connectivity and basic HTML output. But this release goes a lot further.

Start Word Pro and you'll find two new sets of SmartIcons. The Internet tools comprise buttons for opening files directly from a web or FTP site, or publishing the current document (assuming you have access rights) straight onto a web site. Further SmartIcons offer connections via your web browser to the Lotus Home Page, Customer Support Page, FTP site or Internet Directory. A set of SmartMasters (interactive templates) offers web page layouts with Click Here fields to replace dummy text with your own.

## Teamwork

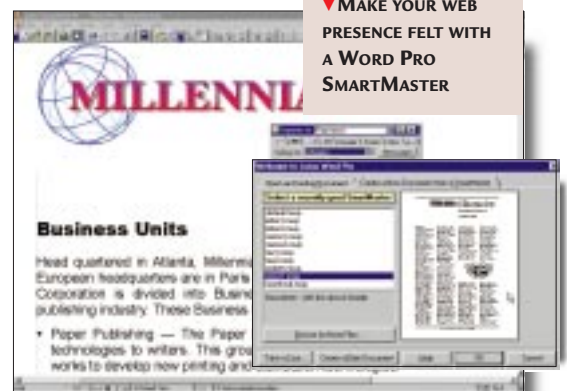
SmartSuite 97 comes with tools allowing group review of documents, consolidation and saving multiple versions. The Team features originally seen in Word Pro are now part of 1-2-3. TeamMail lets you distribute data to colleagues, simultaneously or sequentially. TeamReview brings it back, with amendments from the other members: the author can



▲ 1-2-3 OFFERS SMARTICONS AND POWERFUL DATABASE FACILITIES

replace their original data with the team contributions, or merge the changes as different versions of named ranges. TeamConsolidate works with Lotus Notes to distribute and assemble separate worksheets and merge them into a single file.

Another integration milestone is that Lotus Script, described by the company as a superset of Visual Basic, is now the official language for macros throughout. Lotus 1-2-3 still lets you record macros in the traditional way and existing macros will work, but you also have access to the full power of Lotus Script to create custom applications.



▼ MAKE YOUR WEB PRESENCE FELT WITH A WORD PRO SMARTMASTER



## Approach

Approach is one of the easiest to use of the leading commercial database packages on the market. It follows the familiar tabbed section look, with suite-standard SmartIcons and the InfoBox available in form design view. As well as powerful database features, a full set of Internet tools allows you to open and save Internet/intranet files, and publish in HTML.



▲ SCREENCAM HELPS RECORD VIDEOS FOR TRAINING  
▶ SMARTCENTRE WITH THE FRIENDLY FACE OF ORGANIZER

## Freelance Graphics

Freelance Graphics has the same look and feel as the rest of the suite, complete with InfoBox, but the tabbed dividers switch between slide-sorter, outliner and single slide view. There are 134 SmartMasters which offer not only design assistance but also advice on contents. On the collaborative side, in addition to TeamReview, TeamShow enables you to perform a screenshow for multiple remote audiences from your own desk. All the Internet stuff is here, so you can put an entire presentation onto

The Notepad supports OLE objects and rich-text formatting, and web sites can also be launched from here. Windows 95 TAPI support streamlines autodialling, and the calendar provides flexible, graphic views of time blocks.

## Help is at hand

Overall help includes Lotus Assistants, for such things as mail-merging a Word Pro letter with an Organizer address list, or distributing documents for TeamReview.

And if you want to ask something in plain English, try the search engine Ask the Expert. Word Pro users also get conversion help from Word, WordPerfect and AmiPro.

## SmartCentre

In overall control is SmartCentre, sitting at the top or bottom of the screen, neatly avoiding the Windows Taskbar. This is

split into Drawers which are sub-divided into Folders. It's customisable with a choice of drawer fronts and a range of sound effects.

The first drawer is SmartSuite. There is a folder of shortcuts to launch each component and to create new documents based on SmartMaster templates in any

application, plus recent files folders for each application.

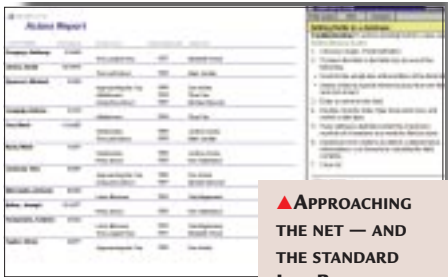
The next drawer is the Internet, with folders for stock quotes, weather forecasts, favourite places and so on.

Apart from help, the Help drawer provides access to Acrobat documents, guided tours and useful web sites. The Reference drawer contains a dictionary and thesaurus. You can leave one or more drawers open at any one time: they hide behind the active application but can be brought to the top by clicking the continually visible bar.

The package includes a calendar, address book and sticky-note reminder. The latter is simple. A list of reminders can be dragged onto the desktop or marked as 'done'. After you have entered a record in the address book, you can click on one of a series of buttons beside each main field to carry out an action.

The calendar and address book synchronise with the appropriate sections in Organizer. Looking up addresses or appointments becomes faster than firing up the full monty of Organizer itself.

To find out more about the latest version of SmartSuite Millennium, why not visit the Lotus website at [www.lotus.com](http://www.lotus.com) or take advantage of our special reader offer to upgrade for only £152.88.



▲ APPROACHING THE NET — AND THE STANDARD INFOBOX

the web, or publish it as standalone HTML documents. An additional facility enables you to jump to a URL 'live' during a screenshow.

## Organizer

The famous Organizer interface uses the classic Filofax look, with no attempt to impose tabs and InfoBox features which, given the success of the product (six million users), is a wise decision. Organizer sets the standard for easy-to-

use yet powerful personal and group information management.

**This software is provided for domestic evaluation purposes only and is not for commercial or professional use and is not supported by IBM/Lotus.**

## UPGRADE ORDER FORM LOTUS SMARTSUITE MILLENNIUM EDITION

Price (inc VAT & P&P): £152.88

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Method of payment:  Cheque  Visa  Access Switch issue no. \_\_\_\_\_

Card no.  Expires: \_\_\_\_\_

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Now send this form and your payment to:

**Software Warehouse, Clifton Road, Gorse Wood, Coleshill, Warwickshire, BA 1SW. Tel: 0800 0355 355**

Please allow 28 days for delivery. Cheques payable to Software Warehouse.

**Your name and our mailing list:** We would like to keep you updated on our products by mail and occasionally we may make your details available to other reputable companies whom we deem to offer goods and services that may be of interest to you. If you do not wish your name to be made available to third parties please tick  If you do not wish to receive product updates please tick  PROMOTION CODE LOT 0211

## Screaming time limit

Screaming.net has imposed a two-hour time limit on off-peak freephone net access which was originally offered as unlimited, users claim.

Spokespeople for parent company Tempo and line provider LocalTel told *Personal Computer World* that they believed a two-hour timeout was operating, which users could get around simply by accessing a website.

But users complain of being cut off and one forwarded an email from LocalTel customer services saying a timeout was not practical as it could easily be got round.

• For a full explanation see Letters, page 68

### INSIDE

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Mac fans gloat page 29

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with new service page 35

# Home nets set to boom as users share access costs

The industry is girding its loins for a boom in home networking, when users realise the ramifications of broadband access.

One reason for the surge in interest is the possibility of sharing the cost of expensive ADSL or cable modem links.

Shared ADSL means shared bandwidth, which could be tolerable for a small number of users – speeds would be much the same as those of many office links.

Cable modems are in an odd position because their bandwidth is already shared between users in a loop. At present, it seems that a single user will be able to grab any bandwidth that is going.

In theory, with no-one else on the line, this could be as much as 30Mbit/sec – although the Ethernet card linking the modem to the PC

is limited to about 3Mbit/sec. This from a line with a nominal speed of 400Kbit/sec.

A block of five flats might pay between £150 and £200 per month for five 400Kbit/sec lines – or set up a 11Mbit/sec wireless network and pay £30 to £40 per month for a single line. In theory, there would be little difference in service – at least until use of the lines hits saturation point.

The latest DOCSIS cable modem standard in the US allows service providers to detect the number of PCs on a line. But for now, cable companies do not appear to be bothered.

A spokesman for Telewest, which launches broadband services early next year, said: 'If users find a way to maximise use of our products, we would be very happy. We see it as an

opportunity as much as a problem. As time goes on, it might be something we have to look at.'

Zoom UK's Geoff Jackman said: 'I've heard people say they could set themselves up as a quasi-ISP, selling line time to neighbours.'

Line sharing is not the only reason to set up a local network. Broadband services are always on, so they can be used with the freedom of radio or TV. Users can receive information streams like stock prices, racing results and news bulletins, listen to concerts or watch video off the net – all barely feasible with time-based charges.

This will create a need for access throughout a home, not just in the bedroom or office where the PC is located.

CLIVE AKASS

# BT among first to jump on bandwagon

British Telecom made a surprise leap onto the home networking bandwagon with the announcement of a wireless kit for homes and small offices to be launched next year.

The kits, developed with a US start-up called Home Wireless Networks, will ship initially in two and four-line modular systems with handsets, phone sockets and data sockets. They feature slots for 802.11 wireless Ethernet and various links such

as ISDN. An entry-level system will cost less than £400.

Intel is developing, with US-based Proxim, a wireless system based on the HomeRF standard, which supports both DECT voice links (as used on

wireless phones) and part of 802.11. It is also working on a system that piggybacks networking onto phone extension cables. This is likely to be the cheapest option until economies of scale kick in on other technologies.

Zoom already offers 802.11 wireless links, but at about £200 a node, they are not cheap. It is about to launch a system based on home phone lines – the first to be approved for Europe. The system should start shipping around the time you read this.

Philips has developed systems based on 1394 (Firewire), plus a wireless card which supports both 802.11 and HomeRF.

A big barrier for all these products will be to make setup easy. Configuring a local network can be tricky even for experts, and these have the added complication of shared access.



Disney invited techie journalists to a preview of *Tarzan*, mainly to boast about its squeaky clean website at [www.disney.co.uk/tarzan](http://www.disney.co.uk/tarzan). Disney is using the site to launch a safe surf campaign. All very

laudable, except that women in the audience were offended by the depiction of a gorilla mother apparently refusing young Tarzan milk because she lacked breasts. Is this the kind of traumatic image we should be showing our children?

## Fatbrain turns authors into publishers

A company called Fatbrain claims it will do for publishing what MP3 has done for the music industry. It has developed a system called eMatter for selling digitised documents online – and collecting the royalties.

Authors could use the system to sell their work directly to the reader, and magazine publishers may use it to resell archived articles.

Fatbrain chief executive Chris MacAskill says that it provides, for the first time, a way to sell short documents: 'What if you want to write something that's 20 pages and sell it? There has never been a model for this.'

Authors can post material, with a summary, on the Fatbrain site. They will receive 50 per cent royalties – or 100 per cent between 18 October and 1 January. MacAskill said: 'It will change the world of publishing. It will empower a whole range of authors to go straight to the people.'

TIM BAJARIN

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

## Tiny boots out 'free PC'

Tiny Computers has dropped its 'free PC' offer – allegedly because people were not interested.

The deal offered an entry-level PC without a monitor, on condition that users signed up to Tiny Telecom for one year and spent at least £25 (ex VAT) per month on calls.

It was in effect, as PCW pointed out last month, a

hire purchase, as you would pay full prices for calls that would be discounted if you signed up direct with Cable & Wireless, Tiny's service provider. Jim Buchanan, Tiny spokesman, said: 'The UK public was too sceptical. And it was not an ideal solution because there was no monitor.'

Buchanan said the offer attracted 25,000 calls in

two weeks; nine in 10 went for an alternative offer of £200 off a PIII PC. This offer still stands.

Tiny is unlikely to be the last company to offer a free machine to web sign-ups. As ecommerce develops and the price of net-access devices drops, giveaways could become a cheap way to capture customers.

VNU NEWSWIRE

IBM's Microdrive is spurring Flash RAM vendors into giving us higher capacities. Distributor JenOptik reckons it will have 192MB Compact Flash cards later this year for around £250 inc VAT. CFII cards should reach 245MB early next year. Microdrive prices have been quoted as around \$1 per MB, although this could be higher in Britain.

Jenoptik 0181 953 1688



## Faulty LineOne

Thousands of users of service provider LineOne were without email for three days when servers were taken out of action to expand their capacity following a surge in subscriber numbers.

LineOne had boasted that its membership increased from 80,000 to more than 400,000 after it joined the legions of free providers. It now appears to be a victim of its own success after it seemingly underestimated the work involved.

CLARE WOFFENDEN

### POINT OF VIEW

## Parrot power

It is a fact well known to journalists that everyone is interested in parrots. Any story involving one will get blanket coverage. Deny it if you will, but I bet you would read a story headed 'Parrot drives bus' or 'Parrot rescues cat'. Parrots transform the ordinary into the newsworthy.

The word 'hacker' lacks quite this alchemy but it is a good parrot word, the mere mention of which can help a tired story along. Similarly, any story knocking Microsoft goes down well.

So if Freeserve's, AOL's or (see above) LineOne's email service go down, as they have in the past, you get a few paragraphs at most in the heavy newspapers. When Microsoft's Hotmail gets hacked, it makes the main TV news.

True, Hotmail did not simply break down: Microsoft was forced to close it

after someone posted instructions enabling anyone with a browser to look at the email of any user. But, as with many hacking horror stories, it is quite likely that no one did any hacking. Instead, details were leaked of a 'back door' into Hotmail's system – equivalent to handing out the keys to a mailbox.

Hotmail allows you or anyone else to read your mail from any browser, anywhere, simply by typing your user name and password. It sacrifices security for simplicity. This makes it a useful global message board, but you'd be crazy to use it for anything you would not put on a postcard.

None of which makes Microsoft any the less remiss. What is worrying is that

this is just the latest and least of several scares involving its systems. And blaming hackers, if hackers are not involved, disguises the main dangers.

This is the parrot effect: sensation obscuring fact. It leads, for instance, to the common perception that young women and children are at most risk from strangers; in fact, young men are far more likely to be attacked and injured, young women are most at risk from people they know, and most child abuse is within the family.

From an IT perspective, the enemy within the office is more of a threat than the hacker outside; and the danger of someone seeing a few trivial letters is nothing compared with that of outsiders crawling round your hard disk or website.

Clive Akass



with a bird's eye skew on the Hotmail horror

# Apple pips Intel to post

**M**ac fans were gloating last month following the release of Apple's new G4, with a chip claiming a performance nearly three times faster than Intel's 600MHz PIII.

Apple's apparently permanent 'interim CEO', Steve Jobs, claimed the G4 is the fastest personal computer yet and described its PowerPC G4 processor as the first supercomputer-on-a-chip, delivering a billion floating point operations (1Gigaflop) per second.

The 500MHz G4 is 2.94 times as fast as the 600MHz PIII on a set of Intel's own benchmark tests, Apple claims – though which tests, and how they were performed on an alien processor, remained unclear as we went to press.

Such results do not necessarily translate into an equivalent performance boost when running applications, which may be optimised for particular



processors. But the G4 will give both Intel and Microsoft pause for thought.

It is aimed at restoring Apple in the graphics market, where Macs have been losing ground to PCs running Microsoft's NT. Shortly after the launch Intel announced that its 700MHz PIII would ship in October, a month earlier than expected.

The G4 will ship in 400MHz, 450MHz, and 500MHz versions. All models feature 1MB of Level 2 cache, two USB ports and a 400Mbit/sec Firewire (aka

1394) port.

Prices, discounting the monitor, start at £1,099 plus VAT for a 400MHz G4 with 64Mb of RAM, a 10GB disk and a CD drive. A 500MHz G4 with 256MB of RAM, a 27GB drive and DVD-RAM, will cost in the region of £2,400 ex VAT.

Pictured with the G4 is the Apple Cinema Display, a full-colour 22in 1,600 x 1,024 LCD screen, which would set you back \$3,999 in the US – the UK price and availability have yet to be announced.

There was some doubt about whether G3 owners could upgrade their machines to G4. Apple announced that no upgrade kit was currently available, but two other US companies were reported to be preparing G4 cards.

Meanwhile, Apple claimed to have received 140,000 orders in just 40 days for its new iBook portable computer.

## JavaOS gets dumped but NC lives on

**S**un and IBM have dropped support for the JavaOS operating system in a move at first interpreted as the death knell of the network computer (NC).

JavaOS was designed to run Java apps at an acceptable speed, but Sun says the performance is now adequate on standard operating systems.

Some analysts saw the move as the death of the NC, which was designed to run (usually) Java applications downloaded as needed from a server.

But one form of NC is flourishing – the Internet appliance. These are essentially thin-clients capable of running Java apps – an NC for the masses – and is expected to sell in billions.

Sun evidently thinks so, because shortly after the JavaOS deal it launched a revolutionary scheme to offer apps over the net – see *Tim Bajarin, page 36*

# Gates can't give his charity cash away

**G**iving money away can be almost as hard as making it, cyber-moguls have found. The Packard Foundation and the Gates Foundation suddenly have billions of dollars and are hard put to spend it fast enough.

The Bill and Melinda Gates Foundation, founded by the Microsoft chairman and his wife, has by law to spend at least five per cent of its funds each year. By the end of 1999, it will have paid out about \$500m, less than three per cent of its total worth of \$17.1bn.

It isn't in trouble yet, however, because it has not held the money all year. But few charities are big enough to spend that kind of money wisely and quickly. And few donor organisations are equipped to spend directly. Trevor

Neilson, spokesman for the Gates Foundation, says: "There are real challenges involved. It's easy to give money away. It's tough to do it right."

Things have changed since InfoSeek co-founder Steve Kirsch chastised Silicon Valley multi-millionaires for stinginess after he had to bail out the local branch of the charity United Way.

The Gates Foundation has ballooned and The Packard Foundation, fed by money from Hewlett-Packard, has reached \$11bn in four years.

Online auctioneer eBay suddenly has tens of millions of dollars to donate. And Kirsch, whose InfoSeek web company was bought by Disney, has set up a personal foundation endowed with some \$50m. **TIM BAJARIN**



## short stories

**USB 2.0 SPEEDS ON**  
New USB 2.0 ports expected to ship late next year will run as fast as 480Mbit/sec – two to three times faster than originally announced, and 40 times faster than today's USB 1.1 ports.

The increase, announced at the recent Intel developers' forum, stems from the discovery that these faster speeds can be achieved with no additional cost or complexity.

It may slow deployment of the faster but more expensive 1394 port, used to carry fast data streams from video cameras and the like. The full spec will be unveiled in October.

[www.intel.com/design/idf/static](http://www.intel.com/design/idf/static)



**TAKING DVD IN HAND**  
Hi-Grade describes its thin UltraLite range as 'super-portable', weighing in at under 2Kg. The machines boast a 13.3in screen and swappable DVD module. Prices start at £1,200.

Hi-Grade 0181 532 6100;  
[www.higrade.com](http://www.higrade.com)

**SWITCH TO MANUAL**  
Online bookshops may be all the rage, but Pearson Education is trying to lure PC users back into high-street stores, where they can browse computer manuals to find the one which most suits their needs. Selected shops are also offering PCs as prizes.

**IMAGINATION IS BORN**  
Graphics specialist Videologic has changed its name to Imagination Technologies. However, the company will retain its Videologic and PowerVR brands.

# Prof cracks storage secret

**L**ow-cost, credit-card-sized disks holding 2.3 terabytes (2,300GB) could be available soon thanks to a breakthrough by a British professor.

The technology will transform computing if it lives up to even half of what the makers claim it can do. And its inventor, Professor Ted Williams, hardly lacks credibility: he is already well known as leader of the team that developed the magnetic resonance scanner, which has revolutionised brain research.

Williams is keeping quiet about details of his latest invention while patents are processed, but the product relies on the properties of a new family of alloys.

Storage is three-dimensional, with data distributed within the storage medium as well as across it. 'The only other people I know of who have succeeded with 3D storage is IBM. It did it by stacking five CDs on top of each other,' said Williams.

Read-writes are done optically as in a CD drive, which means there are moving parts. 'You have to get to the right sector and you have to get the focus

right,' said Williams, implying that variable focus is involved in the technology.

He said that access is 'slightly slower' than a hard disk, but predicted: 'This will take over from the hard disk.'

He has been working on the idea for 13 years, latterly under the auspices of the University of Keele, Staffs. Development was part-funded by a £1m grant from the Department of Trade and Industry, and venture capital came from CMR (Cavendish Management Resources).

CMR and Keele University have formed a joint venture called Keele High Density to exploit the technology. The

first prototypes are expected to appear in 2001, and production devices will cost as little as £35. 'The first ones are likely to cost rather more,' said Williams.

The technology could pack 100GB of data into a wrist watch, and could be used in video recorders, ebooks, home data-centre caches and digital cameras, as well as PCs. It involves innovations in the way data is held, scanned and erased. Williams agreed that it could make him a rich man. 'We are talking to some very big companies. We need a lot of money for development. At least £500,000,' he said.

## Forum seeks Rambus solutions

**M**emory companies have formed a forum to find ways to boost production and lower the cost of Rambus memory. Intel has backed the use of Direct RDRAM for next-generation computers, but many PC vendors are looking to rival P133 RAM because of supply problems.

Members of the new Intel-backed RDRAM Implementers' Forum include Hyundai, Micron, Infineon Technologies, NEC, Samsung, Toshiba and Rambus.

The group will also be responsible for approving changes to the RDRAM specification. The move has been endorsed by both Compaq and Dell. Ken Willett, vice-president at Compaq, said it would help the deployment of 'innovative, high-quality, industry-standard memory'.

# Now docking at PortStation

**T**he latest idea to come from PC card specialist Xircom is called a PortStation. At heart, it is a USB hub, providing a theoretical 12Mbit/sec link to a laptop.

But the PortStation is modular, so that other ports and devices can be plugged into it. Early add-ons include



RS232 serial and parallel ports, Ethernet links, PS/2 keyboard and mouse, and even a 56K modem.

Starter kits will cost from £85 ex VAT, with modules costing from £10 to £95. In the long term Xircom hopes third parties may also offer modules for use with the PortStation.

Xircom 01256 332 552;  
[www.xircom.com](http://www.xircom.com)

# Psion sizes up the competition

Clive Akass looks at Psion's new Series 7 and Netbook mobiles, which **expand Epoc's horizons** and challenge Windows CE.

**P**sion has finally launched the mini-notebook we featured earlier this year in our report on the Cebit show, where it was a nameless prototype hidden in one of the drearier recesses of a hall dedicated to business computing. We wondered then why Psion was targeting only the corporate market and we weren't the only ones.

There was such a rush of requests, Psion decided to launch a high-street version in the form of the Series 7. The NetBook, launched at the same time, is outwardly identical but has features tailored for corporate needs.

The machines are essentially the Series 5mx in a larger format. They use the same Epoc32 5.0 operating system and all Psion's applications will run on them, although some third-party ones may need tweaking because of the larger colour screen. They will also run Java apps, if you choose to load the rather hefty Java Virtual Machine (JVM).

The Series 7, at £699 inc VAT, was designed with an eye to keeping the price down: its StrongARM processor runs at 100MHz, its applications suite (including a browser, but not the JVM) comes on ROM, and it comes with 16MB of RAM upgradeable to 32MB.

The NetBook costs £799 ex VAT. Its StrongARM runs at 199MHz, and its

application suite is loaded into a standard 32MB of RAM, upgradeable to 64MB. This gives companies the flexibility to choose which applications to load – with the JVM, they occupy 14MB. You can boot off a supplied Compact Flash card if you lose the contents of your RAM.

Both machines are aimed at mobile users for whom notebooks are too large, and palmtops too small. Both weigh just over 1kg apiece and boast a 7.7in VGA STN colour screen which can be driven by pen or keyboard. Their leather-clad 23.5 x 18.2 x 3.7cm clamshell case retains the stylish look that has become Psion's hallmark.

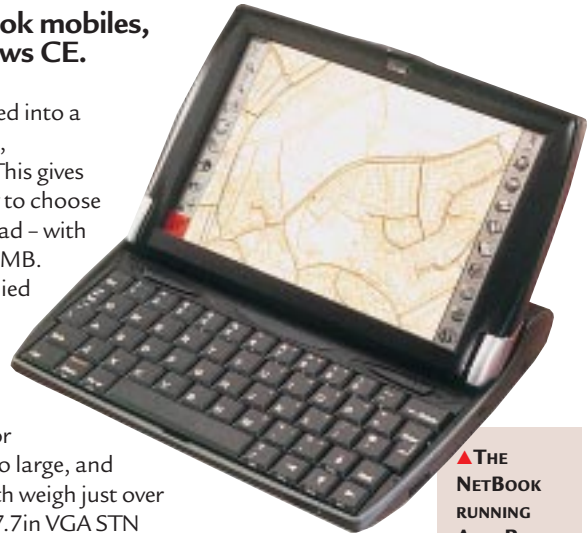
The rechargeable Lithium-Ion batteries last a claimed 8.5 hours, a figure Psion hopes to boost to 11 hours.

The base of the machines can connect with an optional docking station. Around the rim of the case are a 4Mbit/sec infra-red port (which can exchange electronic business cards with the likes of the Palm Pilot), an RS232 serial port, a PC Card Type II slot, and a Compact Flash II slot which can take a 170MB or 340MB IBM Microdrive (and 224MB CFII Flash RAM modules could be available by the end of this year).

What the slot can't use, because it will work only with its lid shut, are devices which stick out at the end, like Xircor's CFII-based Ethernet link. Psion says this may change in later models.

There is no internal modem – to keep down the price, and maximise flexibility, according to Psion. Drivers are available for Psion Dacom PC Card modems, and other major brands will be supported.

There is a flaw in the case design: a raised ridge at the edge of the keyboard, which ensures a tight fit with the lid, is not recessed at the space bar. This sounds a small point, but if you use your thumb to strike a space it can make typing excruciating because the joint is



▲ THE NETBOOK RUNNING AUTOROUTE

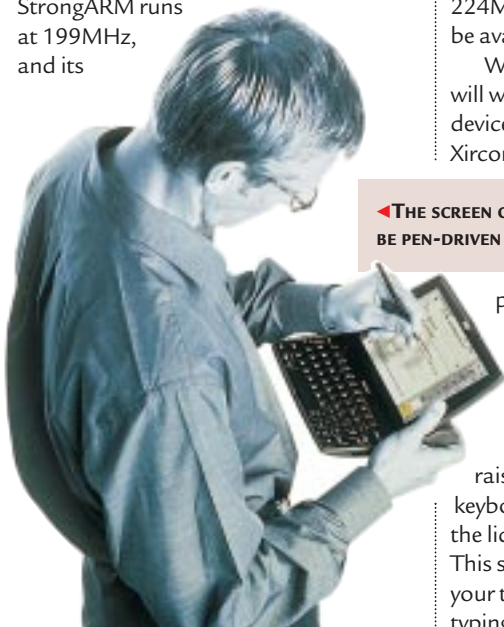
forever hitting the ridge.

It's an old and common fault in handheld designs, easily avoided, and Psion should have known better (particularly as your humble reporter warned the company about it after Cebit). This is a pity because the keyboard, surely the major reason for choosing this model rather than a cheaper palmtop, is otherwise very good.

These machines are up against similar Windows CE-based models such as HP's Jornada 820e. Many believe Epoc32 to be the better operating system, and it will certainly go down well with the anything-but-Microsoft market. Neither OS runs full Windows apps, although both offer file compatibility and easy synchronisation.

CE has a greater market momentum, and more applications are being developed for it; but this may change as the Symbian venture, launched with leading mobile phone vendors to develop Epoc, gathers pace. Psion was writing pocket software long before Microsoft, and bequeathed Symbian a mature development environment for the vital task of tailoring software to corporate needs.

Sales of both CE and Epoc minis are likely to be hit by the emergence of only slightly more expensive (albeit heavier and with a shorter battery life) Win98 mini-notebooks. If the Psions had come out a year ago they would have been sure of success. They have a much harder market to crack now.



◀ THE SCREEN CAN BE PEN-DRIVEN

# Net for free with British Library

The British Library has become the first public-owned organisation to offer a fee-free net access service – providing, incidentally, a prestige domain for email addresses and websites.

The library has been criticised for lagging behind the likes of the US Library of Congress in providing online access to its collection. But finance has been a running sore, with its just-completed £511m building at St Pancras, London, going over-budget to the tune of no less than £479m.

In fact, much of the income that the grant-aided library generates comes from new media in the form of CD-ROMs – it has resisted introducing entrance fees. A suggestion that the entire collection be

digitised as Britain's prestige millennium project sadly lost out to the Dome.

But the library says it is committed to putting more of its collection online and you can see classic works like the Lindisfarne Gospel at its existing website <[www.bl.uk](http://www.bl.uk)>. You also get free access to OPAC, which has nine



▲ IN BITS... THE LINDISFARNE GOSPEL, DIGITISED AT THE BRITISH LIBRARY SITE

million references to archived literature.

Brian Kefford, online manager of the National Bibliographic Service, is responsible for the new access service at [www.britishlibrary.net](http://www.britishlibrary.net). 'We see it as providing a framework within which our web services can grow,' he said.

Users will get the usual free email address and web

space 'for non-commercial use'. He dismisses the possibility that people might use the library domain name for nefarious purposes – lending credibility to dodgy colleges offering useless courses to foreigners, for example. 'It's something we will have to watch out for. But it is really no different from someone using, say, the Tesco's name.'

Kefford himself does not think it worthwhile to digitise the entire library contents,

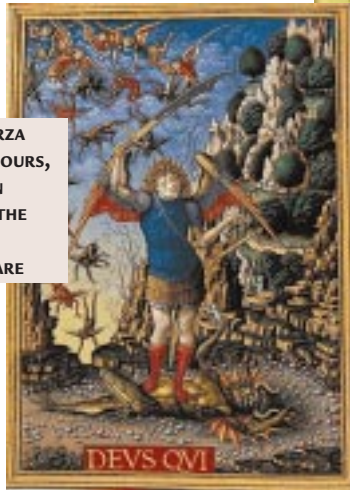
which would cost hundreds of millions (the Millennium Dome has a

projected cost of £758m). 'It would not be worth it,' he said. 'There are books here that no-one would look at.'

He predicts a huge increase in the online availability of learned journals. 'But people will have to come to the books, rather than the books going to the people.'

CLIVE AKASS

► THE SFORZA BOOK OF HOURS, CREATED IN MILAN AT THE TIME OF SHAKESPEARE



## Wireless costs less

Wireless keyboards that free users from the tyranny of the desktop could become mainstream with the launch of a low-cost range from Logitech.

They use radio at about

28MHz and so do not need to be in line of sight like current infra-red cordless models – although a diffuse IR standard is now in place. You can even use them with your back to the machine.

Prices for a keyboard and a scrollable cordless mouse start at £89.99 including VAT – street prices could be less. Logitech is also offering USB mice and a USB hub. It is extending its range of web cameras and force-feedback games controllers.



## Alpha Win2K dropped

Compaq has dropped plans to port the next-generation 32bit Windows 2000 operating system (once known as NT 5.0) to its 64bit Alpha chip – although it will port the 64bit version.

Microsoft later issued a statement saying it would not support new NT development on any non-Intel architecture. However, it will continue to support Alpha-based NT 4.0.

Some analysts concluded that Compaq had decided the system overhead of running 32bit

software on a 64bit chip offset the advantages of using a fast processor.

But Compaq analyst Terry Shannon, citing a leaked memo, claimed the company had bowed to the 'realities of the marketplace'.

The memo went on: 'The decision in no way diminishes our strong partnership with Microsoft or our commitment to Alpha.'

Shannon said: 'The company is aware of the fine mess it has gotten itself into.'

VNU NEWSWIRE



## short stories

### FONT PIRATES WALK THE PLANK

A CD containing more than 4,000 fonts has been removed from sale following a clampdown on pirated typefaces. The distributor, CD Wholesale of Milton Keynes, also agreed to pay undisclosed damages to Linotype Library.

The Library's general manager Bruno Steinert said the case was the tip of an iceberg. 'This product is typical of many hundreds on the market which blatantly include illegal copies of our typeface designs and names.'

### MERGED FUJITSU AND SIEMENS TARGETS UK

The newly-merged Fujitsu/Siemens computer company will target the UK market when it starts operations in October.

It will be run by two presidents: Winfried Hoffmann and Robert Hoog, who currently head up the Fujitsu and Siemens computer divisions. Hoffmann said UK sales will partly be over the net under a deal with BT. Executives were evasive in giving details about which products from each company would continue.

### EARLY XMAS CHEER

It's a bit early for Christmas cards, you may think. But when you get round to buying your cards, bear in mind a new site at [www.charitycards.com](http://www.charitycards.com). Major charities have made five of their best cards available at the site, and will receive 66 per cent of the proceeds, the company says.

### E-BANK OPENS

First-e, which claims to be Britain's first Internet-only bank, has invited people to open savings accounts in advance of its formal launch later this autumn. Details are at [www.first-e.com](http://www.first-e.com).

## Royal Mail postpones e-stamps

The Royal Mail is holding back from implementing 'Internet stamps', which customers can print themselves after ordering online, because it fears for the future of Britain's post offices.

Executives from California-based Stamps.com are preparing to launch an e-stamp system in London. It allows you to buy postage online by credit card or electronic-cash transfer and print it on envelopes at the same time as names and addresses. The 'stamps' are encoded to avoid fraud.

A Royal Mail spokesman said there are 'no concrete plans' to implement Internet stamps. But he added: 'It is no secret that we have spoken to people, and we are watching the market closely, listening to what our customers are saying. If we think our customers like the idea we may go ahead.'

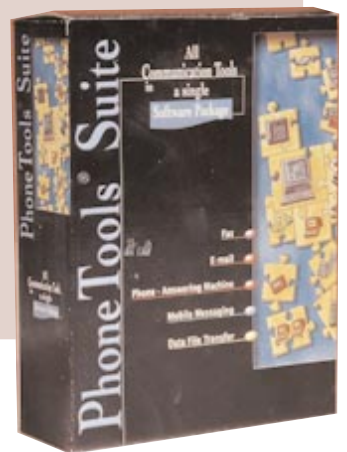
He continued: 'We have 19,000 post office branches and a sizeable proportion of their business is in stamp sales. We would have to think very carefully before doing

## Comms combo arrives

Unified messaging – routing voice, fax and email through the same system – is usually associated with big corporate systems, though packages like SuperVoice have offered something like it to home and small office users. The latest product in this area comes from UK messaging specialist Kommunicate.

Its Phone Tools Suite includes voice, fax and mail functions. It also offers scripting and the kind of facilities found in a traditional comms package: file transfer using protocols like Xmodem and Zmodem, and terminal emulation. It costs £77 plus VAT from [www.kommunicate.co.uk](http://www.kommunicate.co.uk)

Kommunicate 01962 835000



anything that might threaten their survival.'

Stamps.com chief executive John Payne said the company had created an international licensing programme 'to help postal services around the world seize the opportunities of the new millennium without having to break the bank on research and development spending'.

The Stamps.com system will integrate with major

address books and word processors such as Microsoft Word and Outlook.

Recent Royal Mail experience belies the idea that the new conquers all. The use of email and fax may be booming, but so is snail mail. 'We are moving more letters than ever,' said the Royal Mail spokesman.

## Call in the System Mechanic

PCW readers will know the downside of trying a lot of programs. Your machine gets sclerotic as memory, disks and even your processor become clogged by the detritus of dead applications.

One of my machines had slowed to a complete crawl until I tried System Mechanic, a £49.95 (inc VAT) set of 10 utilities sold by POW! It took a



snapshot of my existing system, then listed and (with my permission) removed hundreds of files I didn't need. Better still, it did the same

with routines loaded at start-up that had been wasting my memory and processing power for months. The effect

RELEASE THE  
HANDBRAKE ON  
YOUR PC WITH  
SYSTEM  
MECHANIC

on the PC was as if I had released the handbrake. Touch

wood, I have yet to notice the absence of any vital file.

CLIVE AKASS

POW! 01202 716726;  
[www.pow-dist.co.uk](http://www.pow-dist.co.uk)

# AOL joins fee-free skirmish

**A**OL Europe has finally caved in to pressure from Freeserve and its clones by launching its own fee-free web service, called Netscape Online.

Freeserve quickly ousted AOL as the UK's biggest service provider, but AOL still claims to be the biggest ISP in Europe, with a total of 2.67 million subscribers to its two existing services, AOL and Compuserve.

AOL estimates it has more than 6.7 million users, including multiple line use. Taking

into account its Instant Messaging Utility - which is also open to Lotus Notes users - it reckons it has contact with no less than one in three of Europe's estimated 34 million users.

Paid-for services have been quiet about the level of defections to free services,



► SCHMIDT: A NEW SLICE OF THE PIE

but VirginNet reacted sharply to Freeserve by offering a fee-free option. AOL cut its monthly charge from £16.95 to £9.99 in May.

Executives at the Netscape Online launch insisted valiantly - if implausibly - that users would not drift from its subscription services. Andreas Schmidt, head of AOL Europe,

said AOL appealed to families and Compuserve to business people and other professionals.

Netscape Online, he said, was designed to appeal to the young do-it-yourself user, by which he apparently meant those willing to get themselves online. 'We don't expect much switching over; this is a new slice of the pie,' he said.

Karen Thomson, managing director of AOL UK, said

fee-free subscribers would not have access to content on AOL or Compuserve: 'Some content providers will have a presence on all three. But they will not necessarily offer the same content to each service.'

AOL bought browser pioneer Netscape last year and the merged company has been tipped as a counterweight to the might of Microsoft. Bill Gates has cited AOL-Netscape as proof that Microsoft does not have a monopoly.

Subscribers will receive Netscape's latest browser and email client, Netscape Composer, for designing web pages, and 20MB of free web space. Sign-on packs will be available, among other places, at Woolworth.

## New service has ad enough

A new fee-free service called Wowstars claims to be the first portal to offer a customisable, ad-free home page. Wowstars chief executive, Noel Adams-Tate, said: 'People are becoming very resistant to the idea of ads on the web. I think we are moving on to other business models.' The service is financed partly by a cut of the connect charge and partly by e-commerce deals. You can sign on at [www.wowstars.com](http://www.wowstars.com)

## And now it's time for URLs for the girls

**T**he image of net users as hairy geeks did not long survive the arrival of the graphical browser, and web demographics have been broadening by the day. Now UK sites are opening that are targeted specifically at women. Cable & Wireless has launched



[www.connectwomen.com](http://www.connectwomen.com), aimed at first-time users. On 1st October it is holding an online

coffee morning in aid of Macmillan Cancer Relief. Associated Newspapers, publisher of the *Daily Mail*, which has a high proportion of female readers, opens a women-oriented site called [charlottestreet.com](http://charlottestreet.com) at the end of September.

## short stories

### TERRAPIN ALLOWS WEB SHARING

Low-cost software that will allow small networks to share an Internet connection has been launched by UK net specialist Terrapin. MultiNet acts as both an email server and proxy server, allowing full control of who has what access to the net. Any number of email addresses can be supported. Terrapin, best known for its FTP client, says MultiNet can be used by just a few users or many hundreds. A base licence for 20 users costs £199 plus VAT.

[www.tpin.com](http://www.tpin.com)  
01423 530 8650

### ALL TOOLED UP

A site at [www.webtoolpro.com](http://www.webtoolpro.com) offers not only to host your web pages but also provides tools for you to design them. It's not the first of its kind: graphics company Xara has launched a similar idea at [www.zy.co.uk](http://www.zy.co.uk)

### FAULT ALERT

Packard Bell says it will replace a mains adaptor used to power speakers with the Packard Bell Club 40B PC and PB 1015 monitor. Trading Standards officers in North Yorkshire found that some of the adaptors, labelled DV-91AUPDDVE, have a faulty earth connection. **Fault hotline 0800 9759998**

### MACROS ON TAP

A new version of Macro Express 2000, which creates Win9x and NT macros to automate repetitive tasks, supports text, integer and decimal variables, if-then-else logic and text processing. Other features include message logging and floating menus. It costs \$34.95 from Insight Software Solutions at [www.macros.com](http://www.macros.com)

### SLIPPERY CUSTOMERS

A new site at [www.skipages.com](http://www.skipages.com) is aimed at helping people book their skiing holidays this winter.

## Software out of thin air

Tim Bajarin asks if the first downloadable office suite heralds a software future of virtual products.

Sun's purchase of StarOffice from German company Star Division is an important strategic investment. StarOffice includes a word processor, spreadsheet, graphics editor and other software similar to Microsoft Office. It is available for Windows, Linux, IBM's OS/2 and Sun's Solaris. The suite will be available for free download and will also be available for use from within a web browser.

Microsoft, interestingly, responded to the acquisition by saying it was not threatened. And Sun executives stressed that they were not about to go the way of Corel or IBM, which, with WordPerfect and Lotus SmartSuite respectively, have lost the battle of the desktops to Microsoft Office.

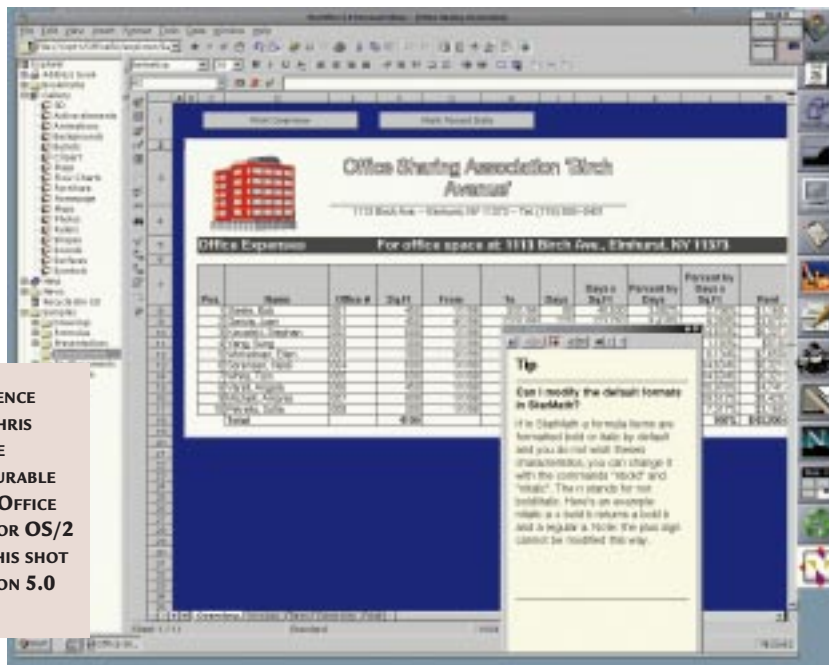
Sun's plan is to ship 100,000 copies of StarOffice to schools around North America. The 65MB suite is big to download, so the basic software on CD will be available for \$9.95 (£6.22) or \$39.95 (£24.96) for a deluxe version with a manual. America Online may put StarOffice on its CD. And computer vendors such as IBM, Compaq, Dell and Gateway will be allowed to bundle it with PCs at no cost.

Sun will create a StarPortal from which users will be able to use the suite and even access their files. It will also work with access providers, software vendors and others to integrate the StarPortal service into their offerings, however they wish to market it.

Developers could integrate pieces of StarPortal's web-based word processor and spreadsheet into their products. Sun would provide source code for further development by the open source industry.

According to Sun, 27 companies have agreed to support the StarPortal initiative. They include AT&T, AOL, EarthLink, and Linux houses Red Hat, Caldera and Linuxcare.

The move is a bid to shake Microsoft's lock on the suite market, but it has implications for the future of the web. All software will develop from



► PCW'S TERENCE GREEN AND CHRIS BIDMEAD HAVE TAKEN A FAVOURABLE LOOK AT STAROFFICE REPECTIVELY FOR OS/2 AND LINUX. THIS SHOT IS FROM VERSION 5.0 FOR LINUX

store-bought shrinkwrapped packages into some form of electronic distribution. Sun is using StarOffice to prime the pump and push software in this direction quickly. It hopes to change the way people think about applications and how they might use them in the Internet age.

It's a real challenge for Sun to push this vision at a time when most people have web links of, at best, 56Kbit/sec, because using applications over the web will require more bandwidth than that. However, DSL services are beginning to catch on and could be available to about 35 per cent of the US, at reasonable prices, by late 2000. We will be well into 2001 before cable modems can promise even that much coverage.

But Sun is not alone in thinking along these lines. Many analysts feel that the real business model will be to rent out web-based software

SmartOnline.com is blazing the rental trail. It is receiving a favourable response from small business users, who use the site to draw up business and marketing plans, purchase legal forms and even incorporate their businesses in real-time web applications. Renting the software can save money. For instance, it

would cost at least \$350 to incorporate a business in the US via conventional legal services, while SmartOnline.com does it for about \$39.

Of course, Microsoft will not stand still. Sources tell me that many of its current applications will migrate to the web for rental. As I write this, Microsoft president Steve Ballmer is due to announce a set of tools designed specifically for creating web-based applications.

All this activity underscores the fact that we are moving towards a world where software is either downloaded from the Internet or used within a web-based solution environment. The only question seems to be, how fast can we move the entire market in this direction? Great tools and higher speed bandwidth will help, but for PC-literate users who love their disk-based applications, it will demand a radical shift in their thinking.

But make no mistake, StarOffice will go down in history as the first broad suite of applications for the Internet and is most likely to be the 'software shot heard around the world' when it comes to setting the course for applications over the next few decades.

## Law of the jungle takes root online

As online trading pushes down prices, Jungle.com hopes to beat off US firms and make a killing.

Steve Bennett, founder of the Software Warehouse chain, has made a £7.5m assault on the web to stave off an expected wave of US online vendors – and to join the rush of people hoping to profit from wild market valuations of net businesses. The move is part of a trend that could have profound effects on magazines and newspapers.

Bennett's company was one of the first in the UK to sell software and other kit online at [www.software-warehouse.com](http://www.software-warehouse.com). But as the online market forces down prices, he cannot afford to sell online at the same prices he charges on the high street.

So he has set up a new site at [www.jungle.com](http://www.jungle.com) – in competition with his own shops. Online prices will be cheaper, but buyers will not have the advantages of personal service or (in the case of hardware) immediate availability.

Bennett compares the move with British Airways' launch last year of the low-cost Go airline. 'BA prices were getting undercut by the small airlines and bucket shops but it could not afford to cut prices on its own services. So it formed Go to beat the smaller operators at their own game,' he said.

Jungle.com will sell CDs, videos, DVDs and games titles, as well as Software Warehouse's fare of PC products. The old site will stay in operation to give information on services and high-street sites but would-be purchasers will be directed to Jungle.com.

Visitors to Jungle.com will be encouraged to stay and return to the site with a selection of games, free



◀ BENNETT HAS SET UP JUNGLE.COM IN DIRECT COMPETITION WITH HIS SOFTWARE WAREHOUSE STORES

software and other attractions.

Bennett freely admits that he has half an eye on the fortunes made on some web start-ups that went public shortly after establishing a net presence. But unlike the many other prospectors who have joined the IPO (initial public offering) gold rush, he is likely to make money from the start – and to make sure, he is spending £7.5m on promotion, with backing from venture capitalists 3i. Some of the money will go on £3m worth of giveaways, with the aim of getting people used to ordering online.

Sites like Jungle.com will eventually have effects far beyond IT retail. If marketing and advertising spending shifts to the web, printed PC publications could be affected.

Some types of advertising, such as for jobs and holiday

homes, have already set up home on the

web; there are claims that response is better off the printed page but the web market has yet to mature.

Vendors are resisting the US fashion for 'bots', or software agents, which trawl IT vendor sites comparing prices – something, again, which could undermine the advertising revenue that sustains many publications. Bennett says all vendors deliberately use different product codes to make it difficult for bots to operate. 'The problem is that they take no account of support and warranties. Comparing on price alone does not give a fair picture,' he said.

Sceptics who doubt the impact of ecommerce should take a look at Dell's figures: sales up 42 per cent to \$6.1bn (£3.8bn); profit up 47 per

cent to \$507m, a rise not unconnected with the fact that 40 per cent of its sales, worth a staggering \$30m a day, were online.

All of which does not mean that magazines which are subsidised heavily by ads will disappear: most advertisers sell online as well as off the page. Bennett reckons he will need half as many PCW pages in three years' time. And, of course, magazines themselves will have a bigger web presence: hence the 1 October relaunch of PCW and its parent VNU site.

Paper is a hard act to beat, and people will still want to read print; but some publications will not be able to survive even a minor

revenue drift. If you fear for your favourite computer magazine, consider that radio was expected to kill

print, and TV was expected to kill radio; in fact radio is booming because people can listen to it while they work or drive; and both TV and radio boosted print sales because people want to read about what they saw or heard the day before.

Something even more complicated is happening with the web. It involves all the media, and will include new commercial relationships based on the peculiar power of web hyperlinks: at simplest, a site may take a cut of any transaction that originates from its pages. This extension of traditional advertising is only just beginning to evolve, and in truth no-one knows for sure how it will all pan out.

CLIVE AKASS

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[www.jungle.com](http://www.jungle.com)  
[www.pcw.co.uk](http://www.pcw.co.uk)

Cath Everett reports on the SCO Forum in Santa Cruz and Linux World in San Jose

## linux shorts

### ▶▶▶ LINUX 2.2 READY TO ROLL

Linux Torvalds, the original developer of Linux, announced that version 2.2 of the kernel has been sent to the publishers. New features include bug fixes and security updates, drivers for devices such as Compaq disk arrays, better USB support, and a symmetrical multi-processing (SMP) infrastructure.

Version 2.4 was also only two weeks away from a tentative feature freeze, Torvalds said, but it would probably not be released for at least four months. It will include full SMP support, better resource allocation, a journaling file system, as well as support for power management, DVD, ISA sound and PCMCIA cards. It will also incorporate a kernel web server.

### ▶▶▶ DELPHI HEADS FOR PORT

The Delphi programming environment may be ported to Linux following a survey of its users, developer Inprise says. It may also port its C++ Builder rapid development tool.

The survey showed that more than four out of five users were interested in using Delphi to build Linux apps. More than two in five would prefer to use C++ Builder for the same purpose. However, only 11.9 per cent were considering Java.

A surprising 32.6 per cent said they planned to switch most of their development work exclusively to Linux.

### ▶▶▶ VA PLANS IPO

VA Linux Systems plans to go public following the success of Linux vendor Red Hat's initial public offering (IPO). It also plans to move into Europe before the end of the year. Red Hat saw its offering price more than triple (from \$14 to \$52) on its first day of trading.

### ▶▶▶ DELL DOES REQUESTS

Dell is to ship Linux-based machines if customers request them, the company says.

## Corel gives Linux desk job

Corel has demonstrated its version of Linux – the first to be targeted at the Windows-dominated desktop market.

The Canadian vendor of CorelDraw and the WordPerfect suite, switched to Linux after ditching an expensive bid to port its applications to Java.

Many analysts see Linux as more suited to server use and unlikely to unseat Microsoft's Windows on the desktop.

But Corel's product

development manager Erich Forler, demonstrating the new distribution at Linux World, said the company aimed to build a version that was easy to use, install and integrate into Windows environments.

He said Corel Linux, which is based on the Debian/GNU distribution, might appeal to businesses as a cheap alternative to Unix, as well as to enthusiasts. It includes an enhanced version of the Windows-like KDE GUI.

Forler said enhancements will be handed back to the open source community under the terms of the firm's licensing agreement.

A beta version is due to ship as PCW hits the stores, with general availability promised for later this year. It will be sold both as a standalone product for less than \$100 (£63), or bundled with the WordPerfect Office applications suite for Linux, which is expected to ship in early 2000.

## Choose your OS on a virtual platform

Windows under Linux – surely this is sacrilege? VMware doesn't seem to think so and by using its software you can run any operating system you like within a virtual machine.

VMware provides a Virtual Platform complete with its own BIOS. Display, input and network devices are provided via links to the host system. Once the 'machine' has booted, any operating system can then be installed on it.

VMware was originally developed for Linux but a Windows NT version is in the pipeline, currently undergoing beta testing.



Those who want to be really silly, can even run Linux under Linux.

WILL HEAD

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

## 64bit battle heats up

Intel chairman Andy Grove made a surprise appearance at Linux World to announce that source code for a 64bit Linux kernel would be available early next year – before his Merced 64bit debut chip ships.

Grove said that some eight operating systems, including Linux, would be available on 64-bit architecture (IA-64) and that Intel intends to set up centres worldwide where developers test its application code.

Meanwhile, IBM denied that its decision to join the Intel-inspired Trillium Project, which is porting Linux to IA-64, will clash with its Project Monterey, which is merging Unix variants from SCO, IBM and Sequent into a single IA-64 standard.

Jonathan Prial, director of IBM's Linux marketing, stressed: 'We're not entering an OS holy war... we'll let our customers decide.'

## SCO backs open source

The Santa Cruz Operation, father and mother of all Unix houses, is to help customers implement Linux systems if they decide the open-source operating system is a good choice.

But company president Doug Michel said SCO has no plans to bring out its own version of Linux. SCO's Unixware will now run Linux applications.

Michel, speaking to a SCO Forum user-group meeting in Santa Cruz, warned that untrue claims were made of Linux, which offered no detailed roadmap, accountability, copyright or patent protection.

# Amiga set to rise from the ashes

The Amiga is about to be reborn as a range of Linux boxes. PC vendor Gateway surprised many two years ago by buying the 14-year-old Amiga technology, developed by the now defunct Commodore Business Machines.

There has since been little

information about its future. But Amiga, which will operate as a Gateway subsidiary, has been busy finding staff – including a number of senior Apple executives – for a relaunch later this year.

Amiga president Jim Collas says Linux will be used as the kernel of a new Amiga

Operating Environment (AOE). The news created such a stir that Collas had to issue a statement urging the Amiga's fans to be patient.

AOE will run on information appliances such as Internet terminals, LCD tablets, set-top boxes and PCs. It will also run Java apps.

The Amiga Multimedia Convergence Computer (MCC), scheduled to ship in November, will have DVD, high-performance 3D graphics, Ethernet-based home networking, digital and analog video and audio ports, and USB.

JOHN GERALDS IN SILICON VALLEY

## Bar-code reader scans desktop space

Optical Character Recognition (OCR), unlike computer recognition of speech and handwriting, has been accurate enough for routine use with printed text for a long time. It is usually quicker to OCR a page and correct the result than to key in the contents again.

By comparison, bar-code readers may seem like primitive devices, redolent of warehouses and supermarket checkouts. Yet they provide a 100 per cent accurate interface between the printed page and the computer. And, as anyone who has tried to machine-read business cards will know, OCR is nowhere near as accurate on some tasks.

Symbol's CyberPen (right), designed by luxury pen specialist AT Cross, is an attempt to extend the use of bar-code readers to the desktop. It can read codes from catalogues, and costs £70 (plus VAT) in bulk – single purchases are rare.

Humble code readers like this could become even more important if technology from Xerox becomes widespread. For some time it has been sitting on what it calls DataGlyphs – data which is coded in an unobtrusive grey



► THE CYBERPEN FROM SYMBOL USES BAR-CODE TECHNOLOGY TO SCAN CATALOGUES

pattern and is readable by any greyscale scanner. They are used in what are called Xerox Working

Documents, to communicate with computers, printers or scanners during processing. Invoices, for instance, may include glyphed customer information with processing instructions.

But DataGlyphs could also be used to print web addresses (which often confuse OCR programs) on business cards, simultaneously appearing in a standard and a machine-readable form.

Xerox, uniquely for a US company, has a reputation for hiding its light under a bushel. It famously gave away the GUI developed at its PARC research centre in Silicon Valley. This raises the question of whether DataGlyphs will go the same way – a good idea whose full potential is developed elsewhere.

But the company has yet another ace up its sleeve: a material which has the potential to combine the advantages of paper and screen.

CLIVE AKASS

Symbol Technologies 0118 945 700

## NatSemi on speaking terms with Lernout and Hauspie

Chipmaker National Semiconductor has joined forces with speech-recognition specialist Lernout and Hauspie to develop voice-activated appliances. The two signed a co-operation deal just weeks after NatSemi's launch of its Geode

system-on-a-chip, the first of a range which tailors PC-processor architecture to specialist devices.

NatSemi chief Brian Halla said: 'Soon it won't be necessary for us to modify our behaviour in order to communicate with machines.'

He predicted: 'Children born today might never use a keyboard.'

L&H has prototyped various speech applications including voice-driven apps and even translators, allowing people speaking different languages to talk to each other.

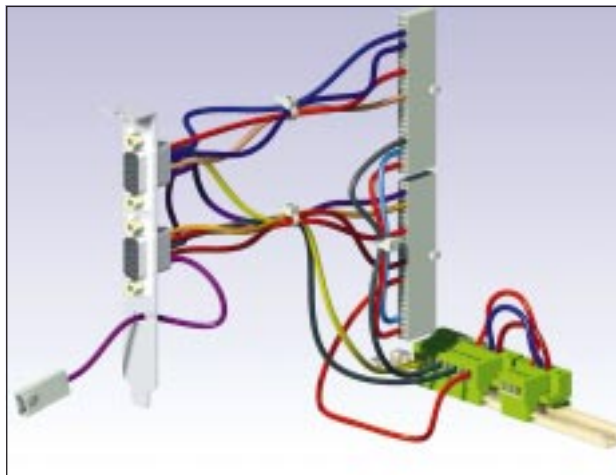
# Vendors fight for top draw

**D**rawing packages have never quite matched the paper and pencil way of sketching out ideas. Visio came close with SmartShapes and quickly captured the lion's share of the large and growing market for easy-to-use drawing software.

The company quickly outflanked Autodesk, which dominates professional drawing with its expensive and hard-to-use AutoCAD range. Autodesk has since produced various packages in a bid to head off its rival, most recently with the UK launch of Actrix, which has yet to register big sales.

Autodesk's AutoCAD LT 2000 is aimed at the more demanding user with a need for 2D drafting – though the company says non-experts can use it too. Naturally, it claims better compatibility with its big brother – as it is based on the fully revamped AutoCAD 2000. Autodesk claims it is 10 per cent faster than the previous version. It costs £595 ex VAT or £99 as an LT 98 upgrade.

Autodesk has also launched a low-cost version of Actrix, designed for business diagramming – another big market for Visio. The launch coincides with the shipping of the latest Visio 2000 standard edition, which



A wiring drawing in the SolidWorks99 package by Cadtek, which now offers the complementary design-analysis tool COSMOS/Works 5.0. [www.cadtek.com](http://www.cadtek.com)

focuses on diagramming. At around £60 it is less than half the price of Visio 2000, though we have yet to compare it on features.

Visio 2000 (£125 ex VAT) boasts a totally revamped engine. The design concentrates on usability rather than new features (although one welcome addition is context-sensitive dimension boxes) and the result is a look and feel close to Microsoft Office apps.

The standard edition focuses on diagramming and office layouts; the Technical and Enterprise editions, including more technical drawing features, will follow.

Oddly for such a mature product, Visio 2000 retains one glaring omission. The diagramming facilities do not auto-adjust if you want to insert a new node. If you are charting the logic of a program, for instance, and wish to insert a new decision branch, you would have to select everything beyond the node and drag it apart to create space.

It's a small point, but one that makes all the difference between a straight charting tool and a brainstorming aid.

CLIVE AKASS

Autodesk 01483 462600  
Visio 01372 847 800

## short stories



► This portable CD drive from Portable Add-ons costs £199 ex VAT and connects to a notebook via a Type II PC Card. Portable Add-ons 01256 361333

► **DRIVE AND TAKE THE BUS**  
Fujitsu has launched a Magneto-Optical drive, which takes removable 1.3Gbit cartridges and uses the 1394 bus – for use on both Apple G3 and 1394-enabled PCs. Fujitsu 0181 573 4444

► **APPLE BITES EMACHINES**  
Apple has slapped a lawsuit on low-cost PC vendor eMachines, for selling what it claims is an iMac look-alike. The move comes just weeks after it launched a similar suit against a vendor called Future Power and its owners Daewoo.

► **GATEWAY TO THE UK**  
PC vendor Gateway, which has traditionally run its UK sales and support from Ireland, has opened its first office in Britain. The office in Uxbridge, Middlesex, will house 25 staff.

There are fears in Ireland that US IT companies will drift away, as EC money which fuelled a mini boom there moves to poorer countries in Eastern Europe. But a spokesperson for Gateway said the new office reflected only an expansion of UK operations.

► **HAVING A BALL**  
Callers to Dell's support line were startled to hear a female Irish voice announce that option four on the business sales option was for testicle support. It was, no doubt, a fault of the voice compression software – it could hardly be a slip of the tongue.



## NetSiren's call to parents

When you consider that sirens in Greek legend lured sailors to rocky disaster, the mind boggles at what a company called NetSiren might get up to. It turns out that NetSiren produces software to keep little boys away from the dangerous sight of, well... net sirens. A product called UC2 will bring up a list of all sites visited recently, show any downloaded pictures and monitor emails. All of which is nothing that can't be done using your browser and email client, you might think. But UC2's log is independent of the browser and is password-protected, so it can't be erased. It costs £29 ex VAT.

NetSiren 0207 2423 0523 [www.netsiren.com](http://www.netsiren.com)

Third-generation roads **lead to Guildford**, finds Gordon Laing, in his search for the mobile future.

# Tasting the forbidden fruit



Be in no doubt that mobile computing is the future. Who wants a nasty big beige box dominating their desk when a handheld device will offer all the power and connectivity you desire? If you think high-speed wireless networks are exciting,

wait until you look into embedded systems, which could dominate your kitchen with a new flavour of oven chips.

**It's a dream** we've heard about for some time, but will any of it work? I was recently invited to Ericsson's HQ in sunny Guildford for a demonstration that both previewed future mobile comms, and once again confirmed this commuter town as the hub of high-tech services. If you winced when NTL announced the town would host the debut of its cable modem rollout, you probably won't want to know that Ericsson has already built a UMTS (Universal Mobile Telephone System) infrastructure throughout downtown Guildford.

UMTS will be the third-generation mobile phone standard, expected to launch in Europe by 2002. It solves three problems plaguing current second-generation GSM networks: user capacity, global roaming and high-speed data services. According to future predictions, data will dominate mobile traffic over the next few years, so it's crucial we have a significant service upgrade.

If you've used GSM's current data rates of 9.6Kbit/sec, you'll know that blistering is not the first word that springs to mind. Orange has at least announced that it will be the first UK network to upgrade its air interface to 14.4Kbit/sec per time slot, and allow multiple slots to be aggregated into a single higher-speed connection. Good news for mobile users this autumn, but it's hardly a quantum leap.

**Fortunately UMTS** will not be so much a case of jump, but how high? It promises data rates of around 384Kbit/sec to so-called high-mobility users (the ones in cars), and as much as 2Mbit/sec to low-mobility folk (the ones sat at your spare desk). It's a transformation that could see some traditional wireless Ethernet networks dumped in favour of a public mobile infrastructure.

Which brings me back to Guildford. In August, Ericsson invited me to climb into the back of a van – not for a 'discussion' of a review I'd written, but for an early demo of high-mobility UMTS in action. The 'handset'

was a rack-mounted beast, although once custom ASICs had been produced, Ericsson foresaw no problems building one to slip in your pocket – indeed the pre-release GSM 'rack-sets' were larger still.

**Fortunately, the need** for a van to carry it around at least allowed us to test the network at speeds of up to 40mph. Using a Sun UltraBook portable to get the system going, we connected to the network at an impressive 472Kbit/sec and started firing up various applications. We used a decent quality video conferencing link at 250Kbit/sec which included GPS positioning. Then we fired up Quake Arena over a 64Kbit/sec channel and played with the engineers back at HQ. Squeezing in voice over IP at 22Kbit/sec still left us sufficient bandwidth for a brisk web browsing experience. An impressive demonstration that never fell below 200Kbit/sec even under tough conditions.

Allegedly UMTS coverage has reached the Downing Street area, ready for the PM to make a publicity call at the launch of the licence bidding. That too promises to be an exciting time, with five UMTS licences to be granted in the UK, not all equal in capabilities. Nor is it a

**At the last count, 37 companies had put their application MONEY WHERE THEIR MOUTHS WERE and applied for a licence**

foregone conclusion that the first four will go to our existing UK GSM providers. In fact, at the last count, 37 companies had put their application money where their mouths were and applied for a licence.

It's not a cheap business either, with an expected £200-500m per licence, along with several billion to build any kind of network infrastructure, and more on top to continue the handset subsidising we currently enjoy in the UK. With that sort of investment, the contenders are more likely to be banks than groovy media companies.

Personally speaking, I can't wait. I've tasted the forbidden fruit and am hungry for more. I could always buy an old transit, come to some agreement with Ericsson, then drive around Whitehall. Then again, patience is a virtue, but if Clapham isn't one of the exchanges to be upgraded to ADSL by Easter, I'm just going to have to bite the bullet and move to you know where.

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Compuserve's new service has **launched without fanfare**, and Barry Fox thinks he knows why.

# Of CS 2000 and a pig's ear



It is easy to see why Compuserve has slipped the new CS 2000 service onto the market without any formal launch. Although potentially an improvement over previous versions, CS 2000 is still a pig's ear and an open briefing would

have exposed Compuserve to questions it could not answer and bared issues it hoped to keep hidden.

Subscribers who are currently being driven round the bend and into the arms of Freeserve, will be amused by Compuserve's considered thoughts on their problems: 'We are giving more attention to the service itself than to the technology used to deliver it - eg the new Compuserve Portfolio and TravelAgent products.'

**Compuserve has been promising** a complete re-jig since its takeover by AOL. There were beta tests last year and now there is what is laughingly called a finished version. There were no mailouts to existing subscribers or press. The first I heard was when the company put free discs on magazine covers.

The disc installation process asks existing subscribers for their ID and password. But this does not refer to their existing ID. Confusingly it is the free trial code on the disc sleeve. The helplines were quickly clogged with long queues of enquiries.

Once past this hurdle, subscribers have to choose a new name. From then on, mail addressed to the old Compuserve name or number is automatically forwarded. Contrary to what the helpline told me, once you have converted one PC to CS 2000 and chosen a new name, you are obliged to convert every other PC you use because the old-style software can no longer receive mail.

**There is no escape** from the installation procedure, unless you crash out with Ctrl-Alt-Del. This is a trap because the real kick in the teeth for existing subscribers is that they cannot use their old CS name aliases, and every imaginable other variant of a real name has already been taken.

In an unguarded moment one of the helpline staff revealed why. CS 2000 shares a database with AOL, and millions of names were taken by AOL users long ago. The dogends are being snatched by people on a free trial with the cover disc, ahead of existing subscribers.

I spent hours online being offered monikers like Fox79854. Others have had the same experience. These

clumsy name-number combinations are every bit as unfriendly and hard to remember as the original number addresses which Compuserve used.

**Those who do not crash** out must eventually accept whatever nasty name the system forces on them. They are then stuck with it. One user asked to go back to the previous version but then found he was losing mail. Only then did the helpline tell him that the reversion process took several days, during which time mail was automatically deleted. And Compuserve sells itself as a service for business users!

I discovered one useful trick which I'll gladly pass on. For who knows what reason, the mainly American body of AOL users have not had the wit to try phonetic spellings. A few may still be available. In fact, I got away with becoming BarryPhox.

I am just getting ready to go to Berlin for the giant IFA consumer electronics show. In previous years I have connected to Compuserve with a portable PC, in hotel rooms or by GSM cellphone. This year, thanks to the wretched CS 2000 upgrade, I can only cross my fingers.

**Before leaving on any trip** I always do what I tell

**The mainly American body of AOL users have not had the WIT TO TRY PHONETIC SPELLINGS - a few may still be available**

others to do. I get the access number for the city I am visiting, and dial in from the UK. The number which Compuserve has given me for Berlin does not work. Other numbers Compuserve lists can only be accessed from inside Germany. I have a nasty feeling they may not work from a roaming GSM cellphone. There is no way of checking from the UK in advance.

Compuserve is also completely at sea over surcharges for access from foreign countries. There was no surcharge under the previous system but the CS 2000 online advice page says there is a surcharge of £2.50, without saying whether it is per minute, hour or month. Compuserve's press office first said there was a surcharge, then there wasn't.

'The current information on the service is confusing because the link takes you to a US page, but we'll rectify this as soon as possible,' says a company spokeswoman, 'and if you are charged, we'll refund it.' What a mess.

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BT should make **local phone calls free**, particularly for Internet access, says Brian Clegg.

# How about some free calls?



I've been accused of being hard on BT in the past (poor little company), so here's a chance for the giant to prove that it can listen to customers. The pressure to provide free local phone calls, particularly for Internet access, has never been

greater. BT has been shackled in the past, but with its monopoly powers pretty well out of the way, it's time for a change. Last year, BT said that it couldn't make money out of unmetered access to the Internet – now there is good evidence it can.

**For a while now some service providers** have offered 0800 access to the Internet in the evenings and at weekends, but that unlikely hotbed of revolution, Kingston-upon-Hull, has changed the game. Hull had a separate telephone company long before BT existed; for six months the independent-minded Kingston Communications has offered low-cost unlimited Internet access, challenging BT's argument.

Kingston charges £15 a month, then a one-off 5.5p

**No more scuttering around, trying to FIND WHAT YOU WANT ON THE WEB, you can surf at a leisurely pace**

charge for each connection, however long you happen to be online. It's not free, but the lack of metering is the important thing. No more scuttering around, trying to find what you want on the web, you can surf at a leisurely pace.

**Most significantly for businesses**, you can leave your Internet connection on all day without the overhead of a permanent line. Email becomes virtually instantaneous outside the company just as it is inside, and the web is transformed into a real-time information resource. Just think of being able to laugh in the face of three-hour downloads, and to make use of all those dinky desktop utilities that need regular updates from the net. The proof of the acceptability of this approach is that Kingston went from losing customers to the likes of Freeserve, to doubling its new joiners. It seems only a matter of time before other telephone companies follow suit: how about it, BT?

And what about the newly floated Freeserve and friends? It seems as if every major retail company is climbing on the free connection bandwagon – I wouldn't be surprised if sales of drinks coasters have plummeted, given the ready availability of free CDs to rest your coffee cup on.

**For the big few** it has proved lucrative – but for how long? If customers prefer unmetered connection (I certainly would), it will tear the heart out of the free ISP model. Although they get some money from sales and advertising, few free ISPs could exist on this alone. It's the cut they get from the 0845 number that gives them the revenue to survive. With unmetered connection that would disappear, so look out for a big shake-up in the free ISP business if BT goes unmetered. Only those flexible enough to take on a hybrid model are liable to survive.

What we are seeing is just the first ripple of the earthquake. The dramatically faster ADSL is expected to have a flat pricing structure, perhaps as little as £20-£30 a month. While rural users like me may not see it for a while, wide availability of ADSL will throw the game up in the air again. The next five years will be very interesting times (in the best Chinese sense) for Internet Service Providers, and the winners are liable to be us, the businesses and individuals who make use of them.

One impact of ADSL's impending arrival is that BT has decided to make ISDN cost-effective before it becomes redundant. Interestingly, unmetered connection would work well with the Highway ISDN product, because Highway allows you to leave an Internet connection open all the time and still get voice calls through. As I mentioned last month, I've taken the lemming dive into Highway, a process that I expected to be painful, but that has proved the reverse.

I plugged the ISDN adaptor into the USB, loaded the software, told my dial-up connection what to use and, all of a sudden, I was online at 64K, doubling throughput, bearing in mind the error correction losses on a modem. The only irritation is that the combination of this USB adaptor and Office 2000 seems to upset Windows 98 Second Edition, so I get a blue screen of death on shut-down – but hey, who said computers were easy?

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

Research has led Paul Smith to conclude that BT should play on our dependency on ISDN.

# Woe is my connection



If BT wants to make some SERIOUS bucks (because, you know, they really need more ideas how to make money out of us), here's what it should do: give everyone with an email address ISDN for a month... and then cancel it. I know,

through scientific research, that this is a surefire way to instill customer dependency on the service.

My empirical basis is a recent study I carried out, on a sample size of one (me, as it happens). Here's my methodology: get ISDN, move house, go back to analog modem. This has, indeed, had the expected effect: high frustration levels leading to falling productivity, long periods of wistful drooling and an outbreak of hives. My conclusion is that, once you've tasted of the fruit of instant connection and decent bandwidth, you shall no longer want to sup from the cesspit of 30-second handshakes and interminable downloads.

Of course, the strange and dastardly truth is that BT

**It stopped the zone just one block short of my flat. WHY DON'T YOU MOVE TO W12?**

**That's where the trial really is**

made me do it. It's the one that made me move in the first place. BT said: 'We'll put you on the ADSL trial. Where you live is fine. But try this ISDN thingy first.' So I did.

**Then it launched the trial** and stopped the zone just one block - literally - short of my flat. 'Ah, well, mate,' it demurred, 'slight change of plan. Why don't you move to W12? That's where the trial really is.' So I did.

And the day I moved, while my eight-month pregnant wife hoisted boxes and sofas around, I phoned up BT and joyfully announced, 'I'm here. When do I get it?'

'Ah, well, mate,' the reply began, 'slight change of plan. You see the truth is the trial, it's sort of finished. All the installers have gone and there's no kit left.'

'But you told me to move!'

'Sorry.'

Now I'm stuck. I can either sign up for another year

of ISDN or wait until someone comes off the trial so I can have their kit. This isn't looking too likely: today, I phoned the bloke looking into it for me and he wasn't really in a position to help: 'Look, mate, I'm... well, I'm on holiday, in Lake Garda. In a canoe.'

**In the meantime**, I have to use a modem and this has completely changed the way I work. In the short time I used ISDN, I used the net constantly: accessing a database online was quicker than loading a local application. Now, I have to carefully consider my online activities, saving up a bunch of tasks to make the wait worthwhile.

Meanwhile, I've learnt from someone I met at our antenatal class that Cellnet (another BT conspiracy) has begun internal testing of GPRS (General Packet Radio Services). This stepping stone to the UMTS nirvana should offer 115Kbit/sec with full mobility and, because it's packet-based, permanent connection and per-byte billing. My new breathing mate tells me that we should have it some time next year, but, with only 25 handsets and a very localised trial zone, he was reluctant to hand one over quite yet. And, two days short of a baby and having just moved to a new house, I wasn't going to move to Milton Keynes or Milford Haven or wherever the GPRS trial happens to be.

On the subject of telephonic conspiracies, let's talk about the now-annual landline number change. Everyone in London (and a handful of other cities)

now has a new number.

Every London number now begins 020. What is amusing is the number of people and businesses who are savvy enough to get the jump on their competition by upgrading their stationery and hoardings to the new number - but not savvy enough to get it right. All over, people are writing '(0207) 555 4567' and '(0208) 555 7654'.

**Unfortunately, these people** are going to be redoing their hoardings in April: the STD is solely the 020 part. If you're in London and drop off the bit in brackets, you won't dial the right number. Actually, this is an Oftel conspiracy. Or calamity really. The telecoms watchdog's done a hopeless job informing people what their new numbers will be, and I suspect that there are soon going to be a lot of annoyed people feeling rather misled. Then they'll know how I feel.

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# letters

Send your letters to >

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or fax > 0171 316 9313

## Win a Taxan monitor!

Each month we are offering a 17in Taxan Ergovision 750 TCO95 monitor to the writer of the Letter of the Month.

For the complete range of Taxan monitors, call 01344 484646 or visit the web site at [www.taxan.co.uk](http://www.taxan.co.uk)

A full postal contact address is required for letters to be eligible for the monthly prize. We cannot accept correspondence with only an email address provided.



**TAXAN**  
TOKYO, JAPAN  
You won't regret it.

## MP3: A CAUTIONARY MORALITY TALE

A while ago I came across MP3s and subsequently have downloaded several to my hard disk. However, many MP3 sites have links to, or include, pornographic material.

Although most of the sites at [www.top25mp3.com/](http://www.top25mp3.com/) do not contain this type of material, I would recommend blocking all the sites listed if you can. Also, unless you are specific, most links from [www.alltheweb.com/](http://www.alltheweb.com/) will lead to pornographic sites.

You could use [www.oth.net](http://www.oth.net) and download a program such as Go!Zilla. This will bring back FTP links to the MP3 files you are looking for.

JAMES STORMONT

[James@jstormont.f9.co.uk](mailto:James@jstormont.f9.co.uk)

## LETTER OF THE MONTH

# Justify the UK price hikes

On a recent holiday to Germany, as boredom set in having admired all the scenery I could possibly handle, I decided it was time to get hold of a copy of a local PC magazine. It was an enjoyable enough read until I reached the back pages of the magazine and the inevitable adverts for hardware, software, etc.

A quick look at the software prices confirmed my suspicions. Not only are we in the UK being charged extra by car manufacturers, train operators and airlines, but also, it seems, by software companies.

For example, a copy of Macromedia Dreamweaver 2.0 (English version) is advertised at DM532 including tax, postage and packing to the UK. Converted at DM2.70 to the pound, this comes to £197 compared to £269 in the UK, a difference of 40 per cent! Needless to say the price difference is about the same across the board.

Bearing in mind that there are no import duties from EC countries and – unlike a car – a software application does not have to be converted to right-hand drive, how do manufacturers justify these huge differences? Whatever the answer I know where I will do my shopping in future!

GEORGE FEICHTER

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## The Editor replies >

*Manufacturers have an increasingly difficult time justifying pricing anomalies within the European Union, though they may still single out the cost of local support. It's possible that the Euro, if adopted, will eliminate some pricing differentials, and the Internet will certainly have an influence, but really big differentials like this do raise suspicions. We'd like to hear from other readers who have found similar 'bargains' in Europe – did your actual experience of buying and using the software really turn out to involve huge savings?*

## ORBITAL CONSIDERATIONS

Your reviewer's comments on the Evesham Vale Athlon 600 (PCW October 1999) are surely a bit harsh in respect of the inclusion of a Castlewood Orb removable drive. The reason that this drive has not become a standard item is more to do with its recent introduction than any other cause.

The comparison with the Jaz drive is far from complete. The technology is different, the capacity is, as you say, greater and, while data transfer rates are greater, the cost of both drive and, more importantly, the cartridges is less. The Orb drive is or shortly will be available with EIDE, SCSI, USB, parallel port and Firewire interfaces, all well within the first year of introduction. Iomega still does not support all these options and as far as I am aware has not indicated any intention to do so.

If we are to have an alternative to the Iomega products, which is cheaper, has

a higher capacity and hopefully is more reliable, then Evesham deserves to be congratulated for bringing forward new technology, rather than just following the crowd.

JOHN TROMAN

[jtroman@clara.co.uk](mailto:jtroman@clara.co.uk)

## Riyad Emeran replies >

*It's true, the Orb drive is a low-cost removable storage device with a decent capacity. However, you can't escape the fact that a Jaz2 drive offers similar capacity and the advantage of mass adoption. I'm not a fan of monopolies, but at the moment, if you want to transport data you're more likely to find other machines with a Jaz drive than an Orb drive. Not to mention that imaging bureaux and repro houses freely accept Iomega media, giving the formats a greater use than just data backup.*

## DVD & VCR: AN INCOMPATIBLE CASE?

I found Gordon Laing's 'Hands On Hardware' article on DVD (*PCW October 1999*) very useful and informative. I want to buy a DVD drive for my PC and connect the output to my Nicam VCR. I intend to buy a retail kit, including MPEG decoder card, to take the load off the processor. I want the best quality available and the going rate is affordable for me (for example, Creative Labs' kit now available at about £150 inc VAT). However, I have a few questions which I hope you'll be able to help with.

First, I was concerned to read of the quality degradation that occurs if you use a pass-through cable. I understand this is necessary to overlay video on the desktop. However, as I intend viewing on my TV via VCR, can I avoid using the pass-through? (Note: my monitor has two inputs.) Do all the MPEG cards use a pass-through? If not, which ones don't?

Second, My VCR has the usual composite video and SCART inputs. Using the composite video seems simple enough, but wouldn't the image clarity be better using the S-video output on the MPEG card? If so, is it possible to connect the S-video output to the SCART input on the VCR?

And finally, how do the major players compare? For example, the Creative Labs 6x Encore complete kit seems to be widely available, but I've

also seen complete kits (ie with MPEG decoder cards) available from Sony and Philips. In fact, how about a group test?

JOHN GILMARTIN

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### Riyad Emeran replies >

First and foremost John, why do you want to connect your DVD player to your VCR? If you're intending to record DVD movies, you're contemplating video piracy and FACT (Federation Against Copyright Theft) would not be very happy about this. And even if you didn't get caught, why would you want to watch a DVD movie on a VHS cassette?

Moving on, I'm afraid the majority of MPEG2 decoder cards use pass-through cables. There were a few that didn't, but I haven't seen one like that for a while. However, if you never intend to watch films on your PC monitor you don't need to use a pass-through. But, since you pointed out that your monitor has two inputs, you could connect your graphics card to one input and the MPEG2 card to the other. That way you have the option of watching movies on your monitor without degrading your graphics card's signal.

You're right, the image is far superior using S-Video rather than Composite since the chrominance and luminance signals are separated. However, unless you have an S-VHS VCR, it's unlikely that it will be able to accept an S-Video signal. As for what to go for, any new DVD-ROM drive can supply data fast enough for MPEG2 playback, the important part is the decoder card. The majority of good cards on the market use the Real Magic Hollywood chipset from Sigma Designs. Sony bundles this card, as does Philips, and Video Logic makes a card based on the same chip. On the whole, though, if you're really interested in DVD as a movie medium, you're better off buying a dedicated player.

### Correction

#### Sharp PC-A250 UltraLite sub-notebook

Unfortunately, the gremlins got in the works last month and printed the picture of the Sharp PC-A250 UltraLite notebook over the text of the review. We apologise for this error. Readers who wish to read the full review can find it on our website at: [www.pcw.co.uk](http://www.pcw.co.uk)

## DON'T WASTE YOUR TIME...

I read with interest Clive Akass' news snippet at the bottom of page 23 (*PCW October 1999*) regarding the new two-hour limit on screaming.net. He says you can overcome this, but how? What is the second window you need to open? I am trying to download a three-hour driver and keep getting cut off. An early reply would be appreciated so I can use my scanner again.

MARTIN HARVEY

Grantham, Lincolnshire

### Clive Akass replies >

Click on New under the file menu in your browser, then New Window. Clicking your browser icon should also work. You can use this second window while the first is still running. Your download might pause – Windows is not truly multitasking – but any access made from this second window should reset the screaming.net timeout. Just open and close a site in the new window and your download should continue. Note that you can have several web accesses going at once, limited by your bandwidth and processing power.

To be doubly sure you might try using GetRight, a utility that we have featured on the PCW cover discs in the past. It's also available from [www.getright.com](http://www.getright.com). This is recommended for any lengthy download, as there is always a risk of line glitches and it allows you to resume after an interruption.

**Note:** If you are sending a letter by email and wish to be considered for the monthly Taxan prize, please remember to give a full address and contact details.



## ◀ Manic panoramic

Vital statistics: 42in viewable area in a 16:9 aspect ratio, a 160-degree viewing angle and a depth of just 3in. Perfect for wall mounting or hanging from the ceiling in reception areas, and as it can boast flicker-free and warp-free picture technology it won't be distorted by magnetic fields or overhead lighting.

**Contact** Sanyo 01923 246363

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

**Price** on application

## EPOCket-sized Osaris

Psion users have been singing the praises of EPOC for years now and they welcomed the GeoFox with open arms, hoping it would spread the OS further. Sadly the GeoFox is no more, but EPOC is once again branching out - this time in the Osaris from Oregon Scientific. Priced at under £200 and available from Argos, it comes in 4MB, 8MB or 16MB configurations and includes the familiar EPOC applications.

**Contact** Oregon Scientific 01628 680424

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

**Price** £199 (£169.36 ex VAT)



## ◀ Hubless wonder

The ProTrack 60 looks great, it lights up, and will appeal to computer users with dexterity impairments. It also connects to the PC by USB, so why, oh why, oh why, hasn't the manufacturer taken the opportunity to double it up as a USB hub? At 45 x 185 x 140mm (HxDxW) it's certainly big enough and, we feel, a serious omission.

**Contact** Trackerball 01636 626 040

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

**Price** £54 (£45.96 ex VAT)

## Stuck on you ▶

If your monitor is anything like those in the PCW office then you've got sticky notes all around and maybe even on it. That could soon be a thing of the past if the eego takes off in a big way. With a pin board on either side of the screen and a dry wipe board on top it comes in a range of snazzy colours that banish the face of a putty monitor for good.

**Contact** Hotbox 0208 441 1555

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

**Price** £18.95 (£16.13 ex VAT)



## Revamped Rio

The Rio500 has to be not only the coolest looking, but also one of the most advanced MP3 players in the UK. With 64MB onboard and the potential to upgrade to 96MB it has more room than most, and the USB connection means it'll download your music faster, too. With a choice of metallic grey, translucent teal and translucent purple to choose from you should find one to match your mood, as well.

**Contact** Diamond Multimedia 01189 444400

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

**Price** £229 (£194.89 ex VAT)



## Two-2-one

The Miratel Pro ISDN phone optionally comes in one of two customised designs – with a red double-decker fascia, or Tower Bridge as we've got here, and it lets users talk at the same time as sending data over 128Kbit/sec connections. A powerful phone book that pops up the details of recognised users makes use of the screen, but it doesn't come cheap and we soon found out that this particular model looks better at a distance than close up.

**Contact** Electronic Frontier 0118 981 0600

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

**Price** £316.08 (£269 ex VAT)



## Turn on, tune in

Described as 'the ultimate entertainment accessory for notebook PCs', the TV producer card slips into a PC Card slot and, with the aid of an external aerial box, lets you watch TV on the move. Two potential uses: first, if you live in the Meridian region and want to watch something showing in Tyne Tees, you can jump in your car, whiz up there and watch it from the back seat. Second, if you haven't got a TV licence but you've got a car that can outrun a detector van...

**Contact** ACi 0208 357 1116

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

**Price** £292.58 (£249 ex VAT)



## Rawhide

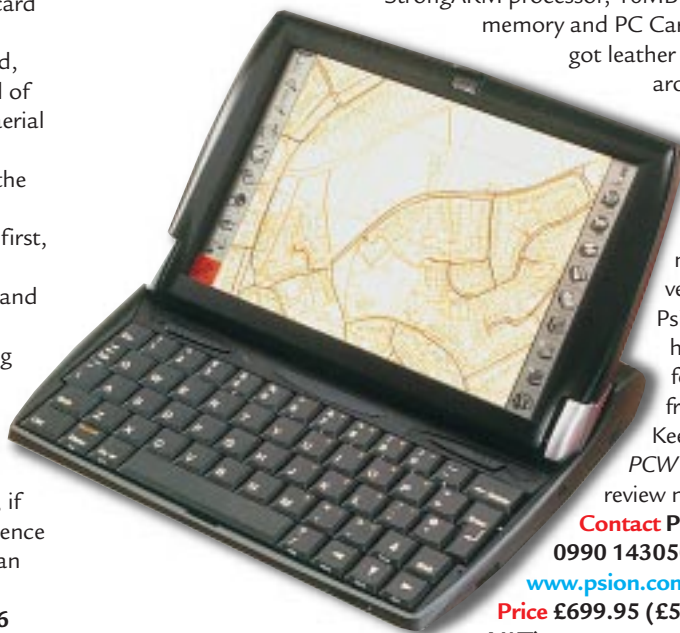
The Series 7 is effectively a Psion Series 5mx with a full colour VGA screen, 100MHz StrongARM processor, 16MB internal memory and PC Card slot. It's got leather trimmings around the back to stop it slipping on the desk, but the bad news for vegans is that Psion currently has no plans for a leather-free version. Keep an eye on PCW for our full review next month.

**Contact** Psion

0990 143050

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

**Price** £699.95 (£595.70 ex VAT)



# reviews

**B**ritish biologist TH Huxley once said: 'If a little knowledge is dangerous, where is the man who has so much as to be out of danger?' This was way back in 1877, well before the invention of the PC and the electronic encyclopaedia. The first examples were text-only works, ran under DOS and easily fit onto one side of a CD-ROM. They wouldn't get a look-in in today's *PCW* but at the time they were an extraordinary achievement. The trouble was they were expensive and as such were restricted mainly to use in libraries and universities. It was still cheaper to buy the paper-based alternative and, besides, you got pictures with that, too. Things are different now and with the launch of Microsoft's **Encarta Reference Suite 2000**, reviewed exclusively in this month's *PCW*, you can now get yourself a comprehensive encyclopaedia, atlas and dictionary for less than £100. Suddenly we can all become that man or woman who has so much knowledge as to be out of danger. Or can we? Can we really equate the possession of fact with knowledge? If so then we're only knowledgeable when we're sitting at our PCs. Those happy to have a constant reminder of their lack of intellect are probably waiting for the day when compression technologies mean Encarta will fit into the ROM of a PDA. Microsoft's already working on that for the dictionary, but in the meantime I'm happy to remain a half-educated danger to society.

NIK RAWLINSON, REVIEWS EDITOR  
[NIK\\_RAWLINSON@VNU.CO.UK](mailto:NIK_RAWLINSON@VNU.CO.UK)



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## VNU European Labs



VNU Labs tests all kinds of hardware and software, from PCs to modems to databases. All our tests simulate real-world use and for the most part are based around industry-standard applications such as Word, Excel, PageMaker and Paradox. Our current PC tests for both Windows 95 and NT are the SYSmark tests from BAPCo. In all our performance graphs, larger bars mean better scores.

## Ratings

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



# Carrera Octane Frio

A PC that **sets a new speed record**, takes overclocking to extremes and all the while remains ice cool.

As CPU speeds increase, the need for efficient heat dissipation becomes more important. Back in the early days of the 486 there was no need for independent cooling of the CPU, but as speeds increased, heatsinks were required to draw some of the heat away from the surface of the chip. With the introduction of the first Pentium chips, active cooling became necessary. Heatsinks with integrated fans started to appear to make sure CPUs didn't overheat.

From that point on, each faster generation of processor has required significant amounts of independent cooling to operate. However, over the past couple of years the practice of overclocking chips has become very popular with the aspirational PC enthusiast.

**Running a CPU above** its maximum rated clock frequency requires even more cooling and the lifetime of the chip is often degraded. However, South Carolina-based KryoTech has found a way to run processors well above the rated clock frequencies without endangering the hardware. KryoTech has taken CPU cooling to the

next level by turning its back on regular fan cooling mechanisms. The solution comes in the form of vapour phase refrigeration. This is a similar technology to that used in a kitchen fridge or freezer, so it's reliable as well as revolutionary. Basically, the base of the unit houses a condenser and compressor configuration that pumps an environmentally friendly freon-type gas around the CPU. This configuration drops the operating environment of the processor to below minus 40 degrees centigrade. With this amount of cooling

**Amazingly, the CPU doesn't suffer from any condensation problems**

it's easy to overclock a CPU by a significant amount.

KryoTech doesn't actually build PCs. Instead it configures the shell in which to build a seriously fast system. The Octane Frio was supplied by London-based system integrator

Carrera, which is an official reseller for KryoTech products and builds complete systems around the KryoTech shell.

**Beating at the heart** of the Frio is a 600MHz AMD Athlon processor, currently the fastest production x86-compatible chip. But, with the extra cooling provided by the vapour phase refrigeration unit, the CPU has been clocked up to a staggering 800MHz.

Inside the system case the most obvious difference to a standard PC is the thick rubber hose that protrudes



from the refrigeration unit and connects to the CPU. The

CPU is completely

sealed in a metal casing so the gaseous coolant constantly circulates around it, without it affecting any of the other components in the system. Amazingly, even with such excessive cooling, the CPU doesn't suffer from any condensation problems.

KryoTech says that it uses a patented method for dealing with condensation and that its expertise in this area is core to vapour phase refrigeration for CPUs. Obviously KryoTech isn't willing to disclose its methods for combating condensation, but it has been producing computer systems working at minus 40 degrees centigrade since 1994, so whatever the method is, it works.

**Carrera has definitely raised** the standard of performance PCs with the Frio. However, it's not just the super-fast processor that's impressive. The storage solution is very special as well. IBM DeskStar drives have traditionally led the pack when it comes to high-performance and high-capacity EIDE devices, but the

Frio sports a massive 37GB model. This is a truly staggering amount of storage that even the most space-hungry of users would be very hard pushed to even come close to filling. Even with this huge capacity, the drive still has a height of only 1in. This means that the data density is very high, which will help push system performance forward further.

One of the three DIMM sockets in the MSI motherboard is filled with 128MB of PC100 SDRAM. This is more than enough memory for most applications, although considering the ultra-high spec of the rest of the machine, the target user may require more.

The graphics solution comes courtesy of a 32MB Maxi Gamer Xentor AGP card. This cutting-edge graphics adaptor is based on the nVidia Riva TNT2 Ultra chipset and produces first-rate results in both 2D and 3D environments.

The 19in LG monitor isn't the best we've ever seen, but the picture is sharp and the colours vivid.

There's a six-speed DVD-ROM drive in the uppermost 5.25in bay, leaving two free bays below. The system case offers a decent amount of expansion considering the extra cooling components that have had to be squeezed in.

**The whole system** case resembles Dr Who's metal companion K9, although



► **THE BODY BEAUTIFUL – ALL THAT POWER PACKED INTO SUCH A SMALL FRAME**

*You really would be buying tomorrow's technology today*

it's missing the head of course. The refrigerating unit at the bottom has an LCD window that indicates the current CPU temperature.

When starting the machine up the refrigeration unit must be powered up first, then after a minute or so the PC itself can be powered on. Once the PC is plugged in and switched on, it won't actually start up until the temperature has dropped to minus 37 degrees centigrade. This ensures that no damage is caused to the CPU before the refrigeration unit reaches its optimum efficiency.

The specification of the Frio isn't a major concern, since this is just an example of the type of machine Carrera can build using KryoTech's backbone.

Obviously, the type of person who will invest in a system of this type will want to configure it to their own personal needs.

**The main concern** of anyone considering a system of this type is speed, and the Frio provides this in abundance. It turned in a SYSmark score of 298. The fastest score previous to this was 260 from the Panrix 600MHz Athlon in last month's group test. This makes the Frio the fastest PC we've ever seen by quite a significant margin.

3D performance was just as breathtaking, with Athlon optimised 3Dmark scores of 7,227 and 5,146 at 1,024 x 768 and 1,280 x 1,024 respectively in 16bit colour. Even without AMD's 3Dmark Athlon optimisation it still turned in scores of 6,825 and 4,972 in the same resolutions and colour depth.

With this kind of performance we think there will be a lot of people rushing to buy one of these systems. Standard 800MHz CPUs won't be available for quite some time yet, so you really would be buying tomorrow's technology today.

That said, when standard processors do catch up with this Carrera/KryoTech collaboration, you'll be left with an expensively



▲ **TAKE THE TUBE – THE MAIN ARTERY PUMPING PRECIOUS COOLANT TO THE RACING CPU**

cold machine that's no faster than a standard PC.

Or will you? Carrera says that it is already looking into ways of performing upgrades on these systems. If this proves to be viable then you'll be buying an upgradeable CPU accelerator that will always keep you a step ahead of the game.

Unsurprisingly, the Frio will make quite a dent in your wallet, tipping the scales at around £3,499 including VAT. But then early adopters are willing to pay such a premium to be at the cutting edge of technology and this machine takes early adoption into a new realm.

Carrera and KryoTech have collaborated to produce a landmark in PC technology. If you're desperate for lightning-fast PC performance and you have a wad of cash burning a hole in your pocket, check out the Carrera Octane Frio. You won't be disappointed.

RIYAD EMERAN

## PCW DETAILS



★★★★★

**Price** £3,499 (£2,977.87 ex VAT)

**Contact** Carrera 0181 307 2800

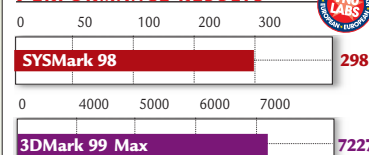
[www.carrera.co.uk](http://www.carrera.co.uk)

**Good points** *The fastest PC on the planet*

**Bad points** *Very expensive*

**Conclusion** *Incredible speed at the cutting edge of PC technology. If you can afford it, buy one*

### PERFORMANCE RESULTS



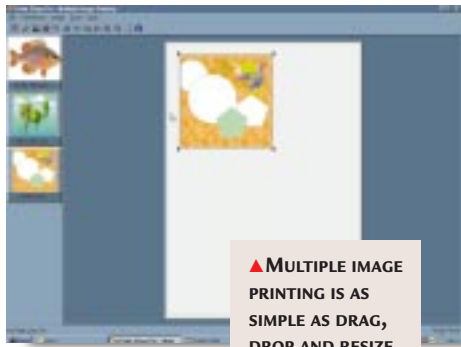
# Paint Shop Pro 6

**A familiar face but with vector capabilities and photographic leanings make this package a great all-rounder.**

Anyone who has even a passing knowledge of one of the earlier versions of Paint Shop Pro from Jasc Software will immediately feel at home with this latest version, currently on beta 5.

But although your first impression may be that everything looks basically the same, just under the surface you'll find some radical changes have been made and several useful new features added.

**The most important** addition is the ability to create vector as well as raster graphics. Vector drawing: object-oriented rather than pixel-oriented and can be resized without losing detail or quality, making them ideal for many types of artwork. Three of the tools – Drawing, Preset Shape and Text – can create either raster or vector objects. Both types can be combined in a graphic on different layers, making for a much more flexible method of working.

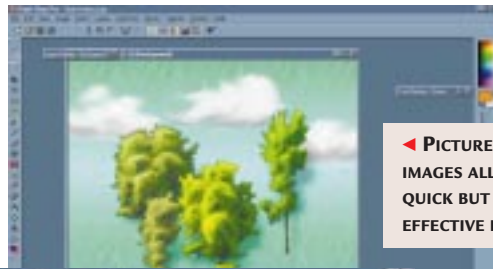


▲ **MULTIPLE IMAGE PRINTING IS AS SIMPLE AS DRAG, DROP AND RESIZE**

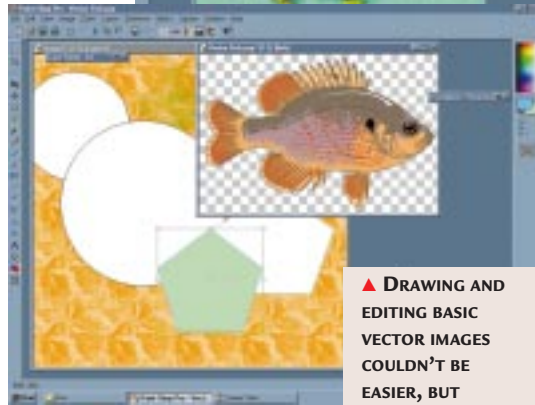
The Preset Shape tool contains more shapes than the four available in Paint Shop Pro 5. Now you can create hexagons, triangles, stars and arrows, as well as the traditional circles, squares, rectangles and ellipses.

Vector objects can, of course, be edited freely, deformed and adjusted by adding or removing nodes. Right clicking the mouse on a vector object also allows you to move and reposition it in relation to other objects within the same layer.

When creating a basic raster drawing



◀ **PICTURE TUBE IMAGES ALLOW QUICK BUT EFFECTIVE RESULTS**



▲ **DRAWING AND EDITING BASIC VECTOR IMAGES COULDN'T BE EASIER, BUT DETAILED GRAPHICS ARE POSSIBLE TOO**

new options. One is a choice of paper texture: such as 'crumpled', 'fog' and the interestingly named 'grainy bumps'. In addition to new paper types, there are extra image effects and deformations. The image effects include blinds, pencils, coloured chalks and mosaics, while the deformations allow skew, perspective, wave and 14 other types of adjustment.

The gradient fill box can now be customised to a greater degree with different gradient types, built-in colour schemes, transparency options and an import/export option for PhotoShop files.

The Picture Tube option, which has always been impressive, is even better, with a sample displayed in thumbnail-style as an integral part of the Tool Options window. Picture Tubes from the last version of the program can be converted into Paint Shop Pro 6 format using a handy utility.

**More emphasis** is placed on enhancing photographs. Existing features for adjusting brightness, contrast, hue and detail now have their use described in relation to photographs in particular, rather than graphics in general.

Since many people now have scanners – and even digital cameras are becoming more widely used – this is a very sensible direction for Jasc to take. But the

company will need to enhance that side of the program further to compete with dedicated photo-editing software such as MGI's PhotoSuite II.

The text tool is vastly improved through the addition of vector text, although floating text is also an option. No longer are you restricted to colour, font, alignment and effects like strike-out – text can be curved along lines and shapes. Words or letters in a text entry can be coloured individually or set in different fonts and point sizes.

**Some operating changes** are more subtle. The Toolbars have optional automatic roll-ups so they can be neatly tucked away when not in use. This saves on workspace, but they can be opened accidentally as the cursor passes. Printing allows multiple images per sheet; any of the open images can be dragged onto the print preview sheet, resized and arranged to suit the user. Images can also have picture frames and you can add digital watermarks through the Digimarc system and import Postscript files. The browser and layers options have also been enhanced.

If you don't yet have Paint Shop Pro, this version would be well worth buying. If you already have Paint Shop Pro 5, it's up to you whether the extra features are worth the cost of an upgrade.

SUE MEDLEY

## PCW DETAILS



**Price** (US) \$99 downloaded, \$109 packaged, \$49 upgrade. UK price not yet confirmed

**Contact** Jasc Software; UK distributor Digital Workshop 01295 258335 [www.jasc.com](http://www.jasc.com)

**System requirements** Pentium processor, 32MB RAM, 40MB hard disk space, display and adaptor of at least 256 colours at 800 x 600, Windows 95, 98 or NT

**Good points** Powerful new vector option and useful additions to existing features

**Bad points** Photo enhancement option could still be more comprehensive, although this could change by the final release

**Conclusion** The best just got better. Apart from photo enhancement, Paint Shop Pro could be everything you need for everyday graphic work

# Encarta Reference Suite

**Knowledge is power, and this benchmark package still reigns supreme in its latest web-oriented incarnation.**

## Encarta 2000 Deluxe Edition

Encarta has undergone quite a makeover for the millennium. The encyclopaedia has a much cleaner design with a heavy web influence. Every major topic now has a Contents Page, from which you can navigate the text, pictures, maps, multimedia elements and associated weblinks that make up the article. The new user interface is a lot easier to use, but if you still manage to get lost you can always click on the Home button, which takes you back to the main Encarta Home page.



The floating Pinpointer has gone, replaced by a standard search box on the main tool bar. This will now accept natural language queries, such as 'What is the size of the moon?' or 'What is the population of Vienna?' It will then deliver a list of relevant articles in which the key words of the query are highlighted. Not exactly artificial intelligence, but it can be a helpful way of finding a precise piece of information, especially in large articles.

Courtesy of Lernout and Hauspie, Encarta has now found its voice. A Text-to-Speech facility allows highlighted sections or whole articles to be read aloud. The voice synthesis sounds artificial at first, but it is remarkably accurate. This is, of course, a boon for visually impaired users, as is the support

for large fonts and high-contrast images.

Education, education and education are at the heart of this encyclopaedia – the target market is, after all, families with children at secondary school, as well as schools and colleges. The Deluxe Edition features a new Curriculum Guide that allows you to pinpoint articles relating to GCSE and A level syllabuses.

The Study Centre includes a Research Organizer, which gives guidance on how to collate material for an essay or report. Once you've organised your outline material, with documented sources, you can export it to a word processor.



▲ BEEN THERE, DONE THAT – TAKE A VIRTUAL TOUR OR CHECK OUT A 360-DEGREE PANORAMA OF YOUR HOLIDAY DESTINATION

and photos – 1,500 more photos and illustrations than last year's version. Editorially, the content may well be a little too 'Family Values' for many people's liking – some of the articles from the original encyclopaedia on which Encarta was based still need a serious overhaul.

Now that the information available on the net is starting to become more reliable, the weblinks feature and automatic install of IE5 is a useful way of linking into the cyber-beyond.

Where Encarta is really streets ahead of its rivals is in the Virtual Tour arena. Never been to Moscow? Then take a virtual tour of the Kremlin. Based on a

series of 360-degree photographs, you can scroll around Red Square as if you were actually there, wandering about. Click on the statue of Lenin, and up comes a picture and text. Click on that sound icon, and hear the national anthem of Russia. Similar tours take you up Mount Everest, around Westminster Abbey, atop Table Mountain in Cape Town and inside the Space Shuttle. The 360-degree panoramas are nothing short of breath-taking – they appear to have no seams, and you can even tilt the viewing angle upwards and down.

As usual there's so much new material

included in Encarta that Microsoft really should put a warning sticker on it – this stuff is dangerously addictive and you can find yourself reading for hours. Once the initial thrill wears off, there's a whole series of Topic Trails to take you through lines of thought or discovery you never knew existed. In

keeping with the times, Encarta has also gone a little millennium mad with a series of Year 2000 relevant topics – including One Thousand Years of Human Endeavour, Music and Literature.

Encarta comes on three CD-ROMs, so disc-swapping can become frustrating. Most users will want to wait for the DVD-ROM version of the entire suite.

## Encarta World Atlas 2000

The World Atlas also has a new Contents page structure, this time giving users a greater amount of information, pictures and 'music' content on any given country, and a good selection of major world cities. But, if you're buying the Suite edition, you might start questioning the overlap of information – essentially you're buying another copy of the flags, national



▲ CONTENTS PAGES HAVE A WEB-LIKE LOOK AND FEEL

anthems, basic facts and figures, country information and city maps that are available in the encyclopaedia itself.

Encarta Atlas has come a long way from its earliest incarnation in the mid-90s. Its excellent global perspective, which allows you to drill down to any point on the Earth, is now available in a range of styles – from physical and political mappings, through tectonic plates and satellite views of the Earth by day and night, right down to climate, population and eco-regional mappings of the world. In other words, there's a lot of earth to explore, and the diverse content stimulates interest.

But World Atlas is also not quite all it's puffed up to be. It doesn't have a particularly rich multimedia library: there are lots of pictures, a few videos and music clips and poorly synthesised anthems. Some of its features, like the '3D virtual flight' option, are nothing short of gimmicky.

The Geography in Depth features are a series of sketchy articles on geographic themes – from the geophysical (eg earthquakes) to the geopolitical (eg European Union development). And the new features that have just been added range from the long overdue (longitude and latitude lines) to the questionably useful (Pushpins for weblinks).

The most useful enhancement is on the Dynamic Sensor, which helps you get to the exact co-ordinates of any place on the globe, as well as details, local time and article references about it. As usual, the database has its holes – New Zealanders might be amused to discover that a hitherto little known hamlet called Matakawau is described as having a population in the 20,000-99,999 range. Sheep, maybe, but certainly not

**Microsoft should put a warning sticker on it – this stuff is addictive**

people. Is it possible that the Dynamic Sensor is similarly imprecise about small hamlets in Russia or Brazil?

Once again the education market is an easy target for Microsoft. We are told by the package that it now has 'network support' for schools, but you'd need a high-spec network for this to be useful, as World Atlas gobbles up resources.

### Encarta World English Dictionary

When Microsoft took PCW to Seattle to see its World English Dictionary a few months ago, it proclaimed English 'the first global language since Latin', since one fifth of the world's population speaks it to some degree. Taking that to heart, and with a \$50m annual budget, the Encarta team produced the first dictionary ever to be compiled across the net. 320 people worldwide, ranging from scientists to the chair of the British Backgammon Society, proposed and defined inclusions, and with a final count of 100,000 head words and 400,000 references they came up with the first new dictionary since two years before the launch of the first IBM PC. It's also the first Encarta product to

◀ DETAILED MAPS LET YOU NAVIGATE THE GLOBE

be available in paper format and on the familiar CD-ROM.

It's designed to be quick to use, and the electronic and

◀ ENGAGING PRESENTATIONS SUCH AS THESE MAKE THE WORLD ENGLISH DICTIONARY A JOY TO USE

paper versions both start each definition with a bold, brief explanation of the word, followed by the traditional in-depth entry. The electronic version includes a wealth of sounds, images and 60,000 pronunciations. It integrates well, too. Installation drops an icon into your system tray, and right clicking on this brings up options for quick

definitions, synonyms, quotes and translations between English, French and German. It also puts two new buttons on the Word toolbar, giving you one-click access to definitions and translations.

We spent a morning typing words into the dictionary, most of which were found, and many of which demonstrated how the product has been localised for a UK audience. Slang and swear words are often localised and it was encouraging to see them included. If you're worried about younger eyes seeing these, the parental controls will block taboo definitions. If you're after an electronic dictionary, this is the one to buy.

BOBBY PICKERING AND NIK RAWLINSON

### PCW DETAILS



**Price** Encarta Reference Suite 2000 (Encyclopaedia, Atlas and Dictionary) £99.99 (£85.10 ex VAT), Encyclopaedia Standard £19.99 (£17.01 ex VAT), World Atlas £29.99 (£25.52 ex VAT), World English Dictionary £29.99 (£25.52 ex VAT) £40 cashback offer on suite for users upgrading from competing products  
**Contact** Microsoft 0345 002000  
[www.microsoft.com](http://www.microsoft.com)

**System requirements** Pentium 90, Windows 95/98 or NT4.0 or later, 24MB RAM for Windows 95/98 (32MB for Windows NT), 155MB free hard drive space, quad-speed CD-ROM, SVGA monitor running at 256 colours, 1MB graphics card, 16bit sound card

**Conclusion** With so many good points and few disappointing features, the highly competitive pricing of the Encarta Reference Suite 2000 and its individual parts makes it the package of choice if you're after a first-class reference work on CD-ROM



# Amari R3K-600 MP2 Workstation

**A purpose-built PC providing a video-editing suite that does exactly what it says on the box.**

**W**hy use nasty VHS tapes for corporate training and education videos? Amari has put together a PC using Pinnacle Systems' new DC1000 package, which provides all you need to encode, edit and produce navigable CDs with DVD-quality video.

Pinnacle's DC1000 includes Adobe Premiere RT5.1 for editing and applying realtime effects without rendering, along with TitleDeko for titling, Sonic Foundry ACID for creating audio tracks, and Minerva Impression CD Pro for authoring interactive CDs.

The card handles broadcast-quality 4:2:2 YUV video using MPEG-2 compression. MPEG-2 takes small groups of frames at a time and only encodes the portions within them that change. However, you can't normally edit a frame that doesn't entirely exist, which is why previous systems employ disk-hungry M-JPEG compression that blindly encodes every frame in full.

**Pinnacle claims** its DC1000 is the first system that can edit MPEG-2 video without encoding every frame in full. If you stop at one of the in-between frames when editing, the DC1000 automatically generates a full one for you to use. There's a fractional pause, but you can make your edit and enjoy overall data rates of less than half that of traditional M-JPEG or full-frame MPEG-2 systems.

With MPEG-2 data rates of no more than 25Mbit/sec required for broadcast quality or 8Mbit/sec for DVDs, you can see how a comparatively modest PC system can be adequate for editing. Amari has fitted a single IBM DeskStar 22GB UDMA drive, capable of sustaining between 9Mbit/sec and 18Mbit/sec. This is more than enough to support even dual streams of MPEG-2 video, without resorting to expensive SCSI arrays preferred by traditional M-JPEG systems.

**The Asus P2B-D motherboard** has four DIMM slots, two of which are occupied by 256MB of PC-100 RAM. An Intel 600MHz Pentium III sits in one of

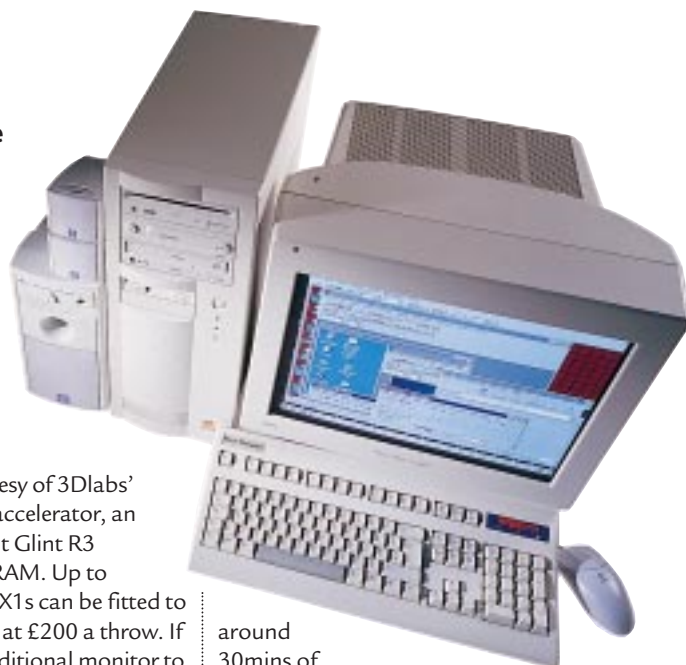
two processor slots, but until Adobe properly supports SMP in Premiere's software CODECs, a second chip would only be of benefit to those rendering 3D animations.

Graphics are courtesy of 3Dlabs' Oxygen VX1 OpenGL accelerator, an AGP card with a 128bit Glint R3 engine and 32MB SDRAM. Up to seven additional PCI VX1s can be fitted to drive multiple displays at £200 a throw. If you're not using an additional monitor to check edits, Amari recommends swapping the VX1 for an ATI Rage Fury which boasts superior video overlay.

The DC1000 may feature audio facilities, but Amari justifies fitting a Sound Blaster Live! card since it offers additional realtime DSP effects as well as a daughterboard with SPDIF digital connections. An Adaptec 2910 PCI SCSI card supports the Yamaha 4x4x16 CD-RW drive, while the motherboard's second EIDE channel supports a Pioneer 6x DVD-ROM drive, and an OnStream 30GB ADR linear tape drive.

The DC1000's optional FireWire DV daughterboard is also supplied, allowing you to digitally connect DV camcorders for generation-free editing. Like the Sound Blaster SPDIF board, the DC1000's DV port is housed on a separate blanking plate. While these don't require PCI slots, Amari has blocked the only two ISA slots with them. Since all PCI slots are also occupied you'll need to do a little swapping around if you want to fit Ethernet or an internal modem.

**With a Yamaha YST-MS28 speaker** system, and superb Iiyama VisionMaster Pro450 19in DiamondTron monitor, the total price weighs in at £4,829 ex VAT, although £2,295 of this is for the DC1000 with DV option. The DC1000 package is superb and will guide you right through to authoring an interactive CD. At variable rates, you'll only get



around 30mins of MPEG-2 video onto a CD, but that's enough for most corporate occasions. Those who want more should consider the forthcoming DVD1000 upgrade, which includes software to author navigable DVDs.

We happily edited both analog and digital video from a Canon XL1 DV camcorder and authored it into a variety of formats using this system. It could prove to be economical, considering most bureaux charge around £30 per minute for MPEG-2 encoding. Pinnacle's DC1000 comes highly recommended for anyone wanting to edit MPEG-2, and once again Amari has put together a capable and immaculately built system.

GORDON LAING

## PCW DETAILS



★★★★★

**Price** £5,674.07 (£4,829 ex VAT)

**Contact** Amari, 0181 810 7441

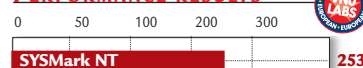
[www.amari.com](http://www.amari.com)

**Good points** MPEG-2 editing with low data rates

**Bad points** No room for additional PCI or ISA cards

**Conclusion** Broadcast quality sub-£5,000 video editing system

### PERFORMANCE RESULTS



# Advent 8707 Linux PC

**The first PC to be built around Linux should meet with resounding success, if it can find the right market.**

Linux has come a long way since the early days when Mr Torvalds had an idea about creating an operating system that was free ('free' as in speech, not 'free' as in beer). Many vendors now cater for a Linux option, but the primary target for these machines is servers for the business market. PC World is hoping to

Also included in the package was a Creative Labs Sound Blaster 64 PCI card, a set of speakers, a 32-speed CD-ROM and a colour inkjet printer. The 6.4GB Fujitsu hard drive provides ample space for Linux, a decent swap file and plenty of extra applications. In terms of upgradeability, there are four PCI slots, one ISA slot available and only one of the four DIMM slots is occupied. There are also two USB ports which, although not currently supported by Linux, soon

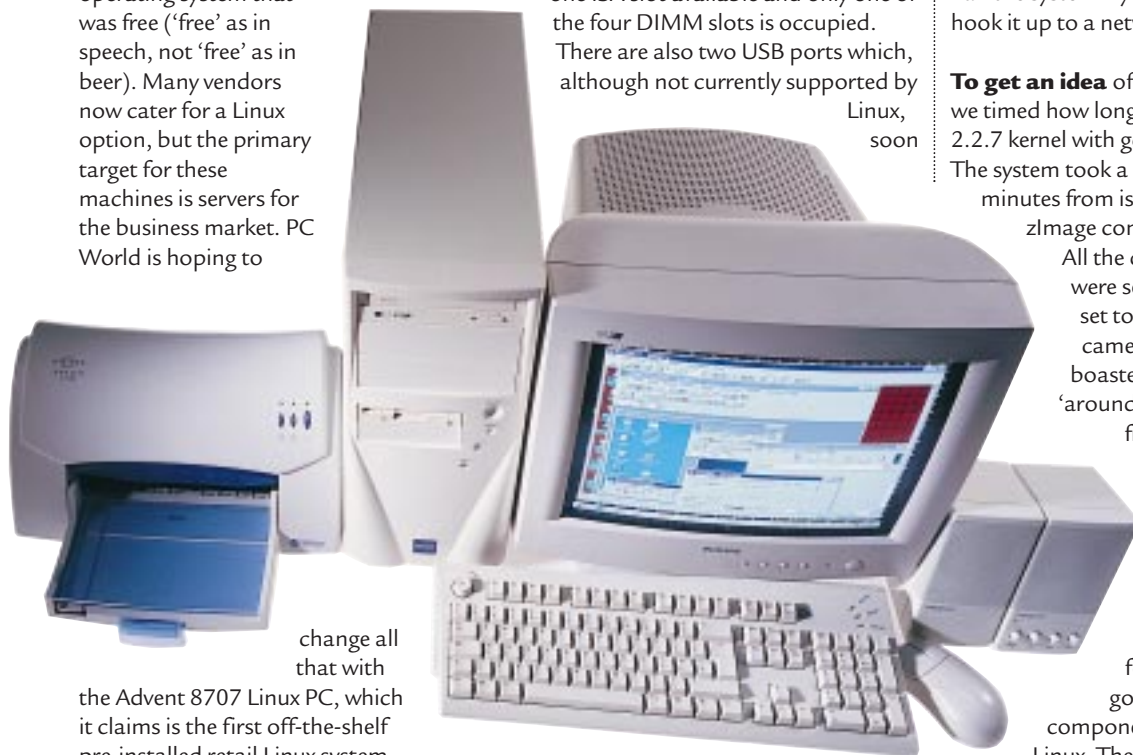
unable to find the network card in this PC, although we have been assured that one will be available as an upgrade option. The lack of network card as standard is a very poor decision, especially given their current price. Linux may make a very competent desktop replacement but you're only really using half the system if you don't eventually hook it up to a network.

**To get an idea** of the machine's speed, we timed how long it took to compile the 2.2.7 kernel with gcc version 2.91.66.

The system took a consistent 4.04 minutes from issuing the Make zImage command to completion. All the default config options were selected with the target set to i386. The notes that came with the machine boasted a setup time of 'around six minutes' with a fresh install on a blank hard drive. We found it to be closer to 10 minutes, although this is still very respectable.

On the whole, we found this to be a very good machine, with the components well chosen for Linux. The only major problem was the lack of a network card. We are still a little unsure as to the target market for this machine, but PC World has to be commended for starting the ball rolling.

WILL HEAD



change all that with the Advent 8707 Linux PC, which it claims is the first off-the-shelf pre-installed retail Linux system.

**The machine is** a 450MHz Pentium III with 64MB of RAM, connected to a Gigabyte GA-6BXE motherboard and based around the Intel 440 BX chipset. This may seem a little under-specified compared to the current machines available, but it is more than ample to comfortably run Linux, which is not unaccustomed to sitting on a 486-based system. The chosen display is a combination of an 8MB ATI Xpert98 AGP card and a Philips 17in monitor. The default configuration for this setup under X windows is a resolution of 1,280 x 1,024 with 32bit colour.

The modem chosen for this machine is a 3Com V.90 PnP ISA modem. The equivalent Windows machine ships with a 3Com PCI modem, but this is a Winmodem and not a full hardware modem. PC World hopes to replace this with a PCI version when a full hardware card is available.

will be. In terms of drive bays, there are two 5.25in and two 3.5in free.

**Out of the box,** the Macmillan Mandrake Linux distribution is pre-installed and configured for the system, with a workstation install being chosen. The Mandrake distribution, which is based on Red Hat version 6.0 but with a number of extra features, is built around the Linux 2.2.9 kernel. The other features include WordPerfect for Linux, Star Office 5.1 and special versions of both Boot Magic and Partition Magic from Powerquest.

As PC World has opted for the Deluxe Mandrake distribution, you will find three online Linux books in Adobe Acrobat format on the third CD. They are SAMS' *Red Hat Linux Unleashed*, and *Teach yourself Linux* plus Que's *Using Linux - Special Edition*.

After numerous checks, we have been

## PCW DETAILS



**Price** £938.83 (£799 ex VAT)  
**Contact** PC World 0990 464 464  
[www.pcworld.co.uk](http://www.pcworld.co.uk)

**Good points** Linux, Linux, Linux

**Bad points** No network card

**Conclusion** A very good system, well thought out for Linux, the only downside being the lack of network card

### PERFORMANCE RESULTS



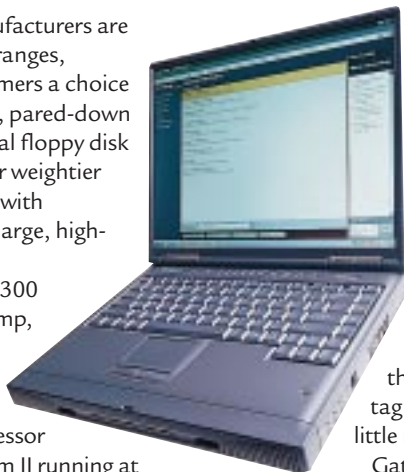
# Gateway Solo 9300

All the **desktop functionality you could want** in a notebook-sized package.

**N**otebook manufacturers are splitting their ranges, offering customers a choice between ultra portable, pared-down notebooks, with external floppy disk and CD-ROM drives, or weightier desktop replacements, with everything built in and large, high-quality screens.

The Gateway Solo 9300 falls into the second camp, with a gorgeous 15in TFT screen, built-in DVD-ROM drive and the fastest mobile processor on offer - Intel's Pentium II running at 400MHz. It also has 96MB of RAM, 6.2GB hard drive, plus graphics delivered by an 8MB ATI Rage Mobility chip, so you really don't have to sacrifice much to get the portability of a notebook.

DVD movie playback is impressively smooth, although sound is a touch tinny from the built-in speakers. But the



beauty of this notebook is that it comes complete with a video out port, which means you can hook it up to your TV to watch movies. Bearing in mind a standalone DVD player costs around £200-£300 this makes the price tag of close to £2,000 a little more attractive. Gateway has followed Apple's example, and fitted the 9300 with a FireWire port, which allows you to transfer data at rates of up to 400Mbit/sec. There are also two USB ports and two PC Card slots, so there's plenty of scope for expansion.

The model we saw was a pre-production unit, so the few faults we

found could be put down to this. But we did find that the touchpad was very unresponsive; it often registered double-clicks as singles, and we had to tap it very hard to get its attention. We also encountered a problem with the DVD drive, which stopped working completely when we paused a movie, and only came back to life after rebooting.

URSULA TOLAINI

## PCW DETAILS



**Price** £1,699 (£1,996 inc VAT)

**Contact** Gateway 0800 973132

[www.gw2k.co.uk](http://www.gw2k.co.uk)

**Good points** High-quality 15in screen, fast processor

**Bad points** Heavy, poor touchpad

**Conclusion** The Solo is as fast and functional as most desktop PCs, in a slimline notebook, but you do have to pay through the nose for this portability.

# Sony Cyber-shot

Open the shutter and focus on a **digital camera that is a joy to use.**

**S**ony's latest digital camera looks remarkably like its first, but the Cyber-shot, also known as the DSC-F55E, boasts a significantly higher 2.1 mega-pixel resolution: 1,600 x 1,200 in real money, and sufficient to produce a decent A3 colour inkjet print.

Since the original DSC-F1 was such a joy to use, Sony has reasonably seen no reason to fix what ain't broke. The case is almost identical, measuring 103 x 79 x 48mm, weighing 300g including Info-Lithium battery, and sharing the same 180-degree swivelling head. This time, Sony has fitted a great Carl Zeiss lens, operating at an equivalent focal length of 37mm on a 35mm camera.

You can't adjust the aperture, but can compensate exposure, alter flash power,



change white balance, and apply four special effects, along with setting DPOF print order. There's a slideshow and PAL TV output, a macro facility and even the option to record video clips. Sadly, the format is

not MPEG-4 like Sharp's Internet ViewCam, but the dated MPEG-1 in 320 x 240 or 160 x 112 resolution.

It stores your snaps on Sony's proprietary Memory Stick, which resembles a short, slightly thick piece of chewing gum. You'll find slots in Sony's latest notebooks and camcorders, but the rest of us should use the optional PC Card adaptor or supplied serial cable; unlike the DSC-F1, there's no infra-red port.

The supplied 4MB stick can squeeze in between five and 15 maximum-resolution jpegs, or up to four minutes of video; an 8MB stick costs about £40, which is comparable to SmartMedia or CompactFlash cards. On the downside there's no optical viewfinder, but you can switch off the LCD backlight and happily use the 2in display in direct sunlight.

All in all it's a predictably gorgeous camera and, at £599, serious competition for Fuji's superb MX-2700.

GORDON LAING

## PCW DETAILS



**Price** £599 (£509.79 ex VAT)

**Contact** Sony 0990 111999

[www.sony-europe.com](http://www.sony-europe.com)

**Good points** LCD which works in daylight

**Bad points** No optical viewfinder; proprietary memory

**Conclusion** One of the best non-optical-zoom 2 megapixel digicams



# NEC Teammate Express 5800 TM1100 Series

**When is a server not a server?  
When it's a desktop machine  
with a SCSI drive.**

**T**his machine from NEC is aimed at SMEs that are after a 10-user file and print server but do not want to spend a lot of money. It certainly is very cheap. This has been achieved through some corner-cutting, though, and as a result it is not a server as we define it, but more of a desktop machine with a SCSI drive.

The core of this Teammate is a Pentium 450MHz processor and 128MB of RAM, which we found somewhat under-whelming at this price. The MSI motherboard is a standard desktop motherboard with no on-board sound, graphics or other components, although it did have two PCI and two ISA slots free. The inclusion of two USB ports means you could use this machine to

serve, using Windows 98, and still connect USB devices. However,

this adds further to the impression that it is essentially a desktop machine.

The AGP slot is occupied by an ATI Rage II card, which, unusually, is held in with the aid of a metal bar. The bar screws into the backing plate and grips the card along its top edge. This has the effect of pulling the card downwards so that it sits at an awkward angle.

**We were pleased to see an LSI Logic SCSI adaptor (for the 9GB drive) and the Intel Pro 100 PCI network card. Both are solid components that have proved their worth in many other systems over time. The 15in monitor is nothing to shout about, but you'd expect that from a system packaged as a server.**

NEC supplied the machine to us with no operating system or disk partitions: the company will, however, pre-load NT Server for you if you wish at a cost of £547.11 ex VAT for a 10-user licence.

Inside we spotted a few minor problems, although build quality was generally adequate. Cables have been tied together and fixed with a plastic loop in front of the processor, instead of along the side. The standard system fan and a further fan in the base, together with the one on the processor, should keep the system from overheating.

The case has some room for expansion: two 3.5in and two 5.25in bays are free, and there is room to access all areas without problems.

However, a server case should really be larger with more bays free.

We ran our standard server benchmark, SYSmark DB, on this machine. This allows a fair comparison of database servers running Windows NT with Microsoft SQL 6.5 Server as the database (see

[www.bapco.com](http://www.bapco.com) for more information). We set the benchmark to test for one to 10 users.

Our results showed that there is no redundancy in this server – the number of average transactions per second levelled off at eight users, meaning when more than this are connected to the server, performance would begin to drop. For basic file and print sharing purposes, however, it would cope, but anything more intensive would be noticeable.

**This does not, however, mean it is a good buy for eight-user installations. The product sits uncomfortably between a server and a desktop – so, as we have said, it is not a server as we would define it. The lack of hot-swappable drives, RAID, back-up devices or management tools make it inappropriate for any form of mission-critical environment.**

If you are thinking of buying a server then these sorts of features should really be included in your spec in order to maximise uptime. If none of this matters and you simply want a cheap computer to act as some form of file store, then some of the PCs in this month's group test would represent better value, with many of them having faster processors and larger hard drives.

You may even be able to trade some of their multimedia options for a SCSI drive to match this NEC.

JASON JENKINS

## PCW DETAILS



**Price** £1,216.13 (£1,035 ex VAT)  
NT Server (10 users) £547.11 ex VAT

**Contact** NEC 0870 010 6326  
[www.necdirect-europe.com](http://www.necdirect-europe.com)

**Good points** Low cost

**Bad points** Inappropriate specification for a machine marketed as a server

**Conclusion** This is really just a standard desktop PC with a SCSI drive, and not one we would recommend for use as a server.

### PERFORMANCE RESULTS

2 4 6 8 10 12 14  
(average transactions per second)

**SYSmark DB** 11.2



# Delphi 5

An upgrade to the best RAD tool for Windows, but still more expensive than its rivals.

**D**elphi is still the best RAD (Rapid Application Development) tool for Windows, but it is hard to pretend version 5 is a major new release.

Outwardly it looks much the same as before, with its form designer, drag-and-drop component palette, object inspector for setting properties, and split-window code editor. Building simple applications is quick and easy, and the resulting executables do not carry the runtime baggage that afflicts Visual Basic (VB).

Delphi's Pascal language is object-oriented and there is no problem delving into the Windows API when you need maximum control or advanced features.

At the top of the new features list is a set of ADO (Advanced Data Objects) components, which let you connect easily to databases using the latest Microsoft API, and without using the BDE (Borland Database Engine). This provides a fast and reliable connection to Access MDB or SQL Server 7.0 data



◀ THIS COLLECTION OF COMPONENTS IN A DELPHI WEB MODULE...  
▼ ...BECOMES THIS DYNAMIC, BROWSER-INDEPENDENT WEB APPLICATION

sources, including Access 2000 files.

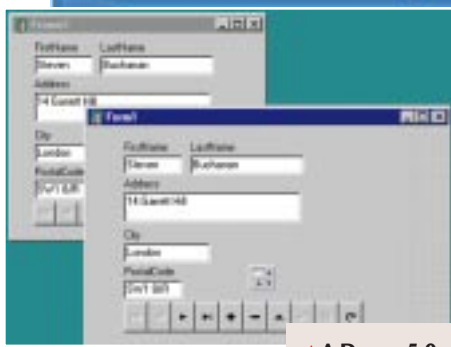
ADO support means it is easy to connect to Microsoft data sources, previously a key obstacle to

Delphi take-up. The catch is that ADO components are a chargeable extra, unless you buy the Enterprise version – a marketing blunder to say the least.

Next up is a new visual component called a 'frame'. Frames can be described as instant components. For example, you might have a group of data-aware controls that describe a customer, which



◀ NEW-LOOK GRAPHICS CANNOT DISGUISE A THIN RANGE OF NEW FEATURES



▲ A DELPHI 5.0 FRAME, SEEN HERE IN DESIGN VIEW AND IN USE ON A FORM

you want to use on more than one form.

The solution is to put them on a frame, which looks similar to a form but is not intended to be displayed on its own. It behaves like a component that you can place on any number of forms in the project. If you add a field to the frame later on, this will appear on all the forms where it is used.

Delphi has some excellent components for building web applications. Previously only available in the high-end version, this web technology is now included in the mid-range Professional version, and lets you create

CGI, ISAPI or NSAPI applications that run on a web server, connect to databases, and deliver HTML.

The Enterprise version retains its edge, with an Internet-Express feature exclusive to this version. This is

based on MIDAS, Borland's multi-tier distributed application technology, and delivers data to a web browser as XML packets. These are parsed by JavaScript routines for final presentation.

Deployment of MIDAS applications, however, requires a further licence.

There is a superb set of translation tools, complete with a translation

repository that can be shared between projects. A new class browser is vastly better than its predecessor. The debugger now provides a sophisticated range of breakpoint actions, along with a useful 'attach to process' feature that lets you debug a process that is already running. The to-do list lets you track tasks within the IDE, and the Enterprise Edition has an integrated source management utility, TeamSource, that works in conjunction with the PVCS version control system to provide additional workflow features.

Despite some handy enhancements, Delphi 5 is not all good news. The Standard edition has been downgraded and lacks any database support. Although Windows 2000 is imminent, there are no extra features to support it. The help files are still in old-style Winhelp format and, while many developers prefer this to HTML help, it is out of step with Microsoft's SDK which is supplied, in an obsolete version.

Delphi is more expensive than VB, which also offers the freely-deployable Microsoft Database Engine based on SQL Server. Borland requires a runtime licence even for the local version of Interbase, which is a loose equivalent.

TIM ANDERSON

## PCW DETAILS



**Price** Delphi 5 Standard £69 (£81.08 inc VAT), Professional £449 (£527.58 inc VAT), Enterprise £1,699 (£1,996.33 inc VAT)

**Contact** Inprise/Borland 0800 454065 [www.borland.com](http://www.borland.com)

**System requirements** Pentium 90 with Windows 95, 98 or NT, 32MB of RAM, 80MB of hard disk space.

**Good points** The best Windows development tool, now with ADO support for easy access to Microsoft databases.

**Bad points** The new features are insufficient to merit a full new release, particularly with Windows 2000 imminent. Delphi is expensive, and distributed applications need further runtime licences.

**Conclusion** Still a stunning development tool, but this release is poor value for upgraders, particularly in the Standard and Professional versions.

# Fujifilm MX-2900 Zoom

If you're a **serious snapper**, try out the new features in this digital camera.

The MX-2900 Zoom is a 2.3 megapixel digital camera pitched at the serious photographer. To say that it's just the MX-2700 in disguise would be doing it an injustice, but there is an element of truth in that – it is based on the same technology and has most of the same features. However, aside from the entirely new shape there are two major new functions.

The most obvious of these is the 3x optical zoom. This complements, rather than replaces, the 1.2x/2.5x digital zoom, and offers coverage similar to the 35-105mm range found in 35mm cameras.

The second new feature is the manual control, enabling the keener photographer to set their own shutter speed or aperture and set the focus manually. There is also manual white balance for changing background lighting according to your preferences.

The magnesium alloy case is packed with other functions, from the LCD display on the rear that can be used as either the viewfinder or for the menus, to the frames that superimpose on the LCD to help line up the photo correctly.

But if you are less inclined to dabble with the settings, you can set everything to the obligatory automatic settings. An 8MB SmartMedia flash memory card is included, but at the top 1,800 x 1,200 setting, you will squeeze just eight

pictures into this. Lower your detail levels and resolution and you can increase that to a maximum of 141 images.

The only negative aspect, price aside, is that it was hard to work out when the shot has been taken. With no clear click, we were left staring into the viewfinder a few seconds more than was necessary.

JIM HARYOTT



## PCW DETAILS

★★★★★

**Price** £699 (£594.89 ex VAT)

**Contact** Fujifilm 0171 586 1477

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

**Good points** Sleek, feature-laden and easy to use

**Bad points** Still quite pricey, difficult to tell when the photo has been taken

**Conclusion** The MX-2900 Zoom is one of the most feature-heavy digital cameras on the market, and what is more it's easy to use. The £700 price tag is likely to put some people off though

# Canon BJC-5100

An A3 printer that tries to **cover too many bases** but doesn't come up to scratch.

Canon is marketing this printer as 'The Personal Printer for the Home and the Office', so the target market is pretty much everyone – and as a result it seems that the BJC-5100 is spreading itself a bit thin. It does not excel at mono, colour or photo printing and its price doesn't match its output.

The printer offers a maximum resolution of 1,440dpi as well as drop modulation technology, which improves the print quality by changing the size of the drops of ink depending upon the input. Small dots are used for areas of low colour saturation and large dots for saturated colour. For mono printing pigmented black ink is used, which has a higher optical density



than normal dye-based inks and gives clearer, sharper text. Sadly, we saw no benefit from these technologies.

In terms of output, mono print quality was average and produced characters that weren't crisp, with jagged edges and banding clearly visible. The claimed speed of 10ppm actually worked out at around 2.47ppm text in out tests, which is a considerable shortfall.

Moving onto colour didn't improve matters, with the output very grainy and areas where the inks had bled into each other. The photo cartridge improved things, but there was still evidence of bleeding. Photo paper produced acceptable output, but we have seen better results

from cheaper printers. The machine was also quite noisy and could be heard from the far end of our Labs.

On the whole, Canon has tried to cover too many bases with this printer and unfortunately this hasn't paid off. While output on photo paper was acceptable, it is an expensive option. Mono output wasn't fantastic and the speed was less than promised. This printer can print on A3, but this fails to make up for the lack of quality.

WILL HEAD

## PCW DETAILS

★★

**Price** £186.83 (£159 ex VAT)

**Contact** Canon 0121 666 6262

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

**Good points** A3 capability

**Bad points** Poor-quality output from mono, colour and photo printing

**Conclusion** An average printer that doesn't justify its price

# McAfee First Aid 2000

Accidents will happen, but **crash protection is included** in this problem-solving package.

One of the big problems of owning a PC is what do you do when something goes wrong? McAfee's First Aid is designed to resolve problems in a few clicks. This version has improved crash protection, a universal undo feature and a knowledge base.

Crash protection re-activates programs that have stopped responding, so you can save your work. In addition, the First Aid Guardian monitors the system for any changes. When you install a program the Guardian detects this and



◀ IN THIS WINDOW YOU 'CLICK WHERE IT HURTS' TO FIX THE PROBLEM

monitors what files are being written to disk and what registry changes are being made, so that universal undo can easily uninstall the program. This is not terribly useful, however, as most programs have good uninstallation options. The undo feature does, however, include restoration of control panel and Internet settings.

The main problem is that Windows can do most of what First Aid does. The maintenance wizard in Windows 98, for example, will clean your Internet cache files, temporary files and the like in the same way as this program does.

The extended knowledge base is a collection of information similar to Windows help files. When testing the software we encountered problems, such as the program frequently crashing and reporting errors when it closed down.

All these problems were fixed using the limited edition of Oil Change included with

First Aid, as well as searching McAfee technical support for a solution to its incompatibility with Internet Explorer 5, but we were not impressed.

JASON JENKINS

## PCW DETAILS



**Price** £24.95 (£21.23 ex VAT)

**Contact** Network Associates  
01753 827 500

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

**System requirements** Windows 95/98, 8MB of RAM (16MB recommended), CD-ROM drive, 65MB disk space

**Good points** Offers a one-stop shop for computer problems

**Bad points** We needed to spend time on the web downloading updates to make it function correctly

**Conclusion** As a consolidation of functions already present in Windows, this may be of interest to the complete novice. Be prepared to spend some time downloading fixes from the web, though

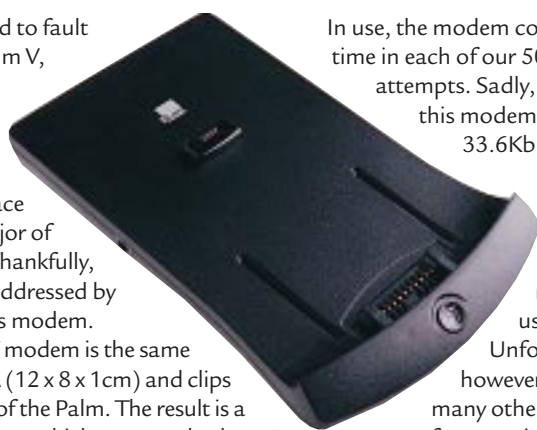
# 3Com Palm V modem

A pocket-sized modem which is **reliable in dial-up use** but could do with V90 support.

It is very hard to fault the new Palm V, though the lack of an industry standard modem interface is the most major of its few flaws. Thankfully, this has been addressed by 3Com with this modem.

The Palm V modem is the same size as the PDA (12 x 8 x 1 cm) and clips onto the back of the Palm. The result is a unit about twice as thick as a standard Palm V, but still small enough to slot into your pocket and only slightly heavier.

There is a single RJ-11 (US-style) phone jack on the back of the modem, into which the supplied US telephone cable and a US-to-UK jack adaptor fit. Like the docking cradle, the modem has a HotSync button, in this instance used for one-touch remote access syncing.



In use, the modem connected first time in each of our 50 dial-up attempts. Sadly, top-speed on this modem is only 33.6Kbit/sec. There is no mechanical reason a 56Kbit/sec chipset could not have been used.

Unfortunately, however, 3Com and many other PDA manufacturers insist on using the slightly slower chipset – mainly as a trade-off against a tiny bit more battery life. 3Com claims 2.5 hours off two alkaline AAA batteries. In our test we actually managed three hours.

In our opinion, more useful than dialling up over a landline is the ability to connect through a GSM mobile handset. The Palm V modem is one of the few

PDA-compatible external modems that support this, allowing use of data-compatible Nokia or Ericsson phones.

A dedicated serial connector is provided on the right side of the modem for the necessary connection cable, although this is an optional, and often very expensive, extra.

CHRIS GREEN

## PCW DETAILS



**Price** £135.13 (£115 ex VAT)

**Contact** 3Com 0118 922 8200

<http://palm.pilot.3com.com>

**Good points** Very slim and light, reliable in dial-up use

**Bad points** Only 33.6Kbit/sec, doesn't stand upright like a docking station

**Conclusion** The Palm V modem is ideal – reliable in dial-up use, small and light enough to leave attached permanently, yet still packs GSM support. It really needs to support V90 though

# HP DeskJet 970Cxi

An impressive inkjet printer which offers excellent quality and speedy results.

No sooner had we finished the October issue's inkjet printers group test than Hewlett-Packard launched the DeskJet 970Cxi. This is a shame because if it had been pitted against the competition there is a good chance it could have won an award.

Large areas of black were evenly laid down without saturating the paper and even text as small as 2pt was legible. White hairlines were clearly visible when we ran them through black blocks – an impressive achievement. When it came to business graphics, colours were realistic and well reproduced.



Standard quality text on photocopy paper was excellent. Characters were a satisfying deep black and with no evidence of feathering, all edges were clean and sharp. This quality setting was indistinguishable from \93best\94, but switching to \93economode\94 produced degraded output, which is a shame as we have praised HP for its draft output in the past.

Slight banding was evident in our A4 photo, and even at best quality there was a little stepping in what should have been gradual fades. However, colours were accurately reproduced and skin

tones, which are traditionally difficult for a printer to replicate, were lifelike.

In terms of speed, it was no slouch. Five standard-quality business letters arrived at a rate of one every 20sec when using photocopy paper. Selecting the inkjet paper option upped this to a still respectable 35sec per page. The best-quality A4 photo fell clear of the paper feeder just 3min 52sec after we hit print.

NIK RAWLINSON

## PCW DETAILS



**Price** £279 (€237.45 ex VAT)  
**Contact** Hewlett-Packard 0990 47 47 47  
[www.hp.com](http://www.hp.com)

**Good points** Fast, excellent quality on photocopy paper

**Bad points** Slight banding on the photo, economy text a little disappointing

**Conclusion** With the 970Cxi, HP adds another quality DeskJet to its already impressive range

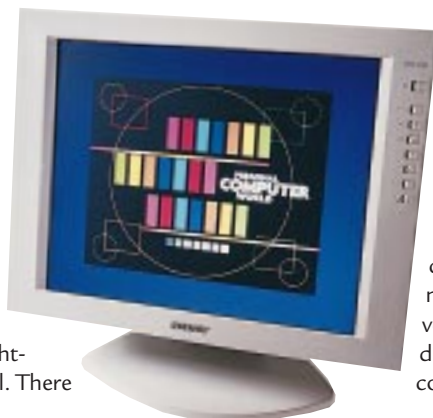
# Sony Multiscan CPD-L181

A TFT display with a flawless image and the added attraction of dual inputs.

Sony is well known as a builder of extremely good displays and the Multiscan CPD-L181 lives up to this reputation.

This is an 18.1in TFT running at a resolution of 1,280 x 1,024 and, as you might expect from any well-built TFT, the image is flawless. Characters are pin sharp and well defined and the luminescence is even over the entire screen. However, like all TFTs, the colours are not as good as you would expect to find on a CRT. This Sony TFT, in common with many TFTs, has problems with darker colours which fade to black.

The OSD is controlled by a number of buttons running down the right-hand side of the bezel. There



are buttons for brightness and contrast, as well as two buttons for controlling the OSD menus. An auto button will automatically adjust the picture to the optimum position and finally there is a button for switching between the display's two VGA inputs.

The options in the on-screen display cover most needs, including three colour settings of 9,300K, 6,500K and 5,000K, as well as allowing users to set their own preferences and all phase adjustments for syncing the screen with the graphics card.

However, we could find no way of moving the screen vertically up and down, although it could be expanded

vertically. The auto button solved this by adjusting the whole screen, but after it finished resizing, the screen still needed to be moved over slightly horizontally.

This problem was a minor niggle and easily corrected, and overall the screen was extremely desirable. The price point may well put off many takers, but at £2,095 ex VAT the screen is only as expensive as other 18in TFT displays, and has the added attraction of dual inputs.

ADELE DYER

## PCW DETAILS



**Price** £2,461.63 (€2,095 ex VAT)  
**Contact** Sony 0990 424424  
[www.sony-cp.com](http://www.sony-cp.com)

**Good points** Screen larger than a 19in CRT

**Bad points** Geometry adjusters not comprehensive

**Conclusion** A lovely display, but still expensive

# HP OfficeJet R45

A multifunction device suitable for small offices – but watch the black output and curly paper.

Multifunction devices, which combine printer, scanner and copier, have long been derided as the jack-of-all-trades of the peripherals market, but HP hopes to change all that with its OfficeJet R45.

There are sensible financial reasons to invest in one of these combo devices, as for £400, the R45 provides you with colour printing, copying and scanning – everything you need to set up a home office in one compact unit. It measures just 495 x 438 x 321 mm and weighs in at 14.4Kg, but don't let its size mislead you as HP has packed in plenty of functions.

In the guise of a 600dpi inkjet printer it claims speeds of 3.6ppm in normal mode for colour and 5.1ppm in mono, though, as ever, these proved optimistic. In our tests it churned

3.1ppm mono and a full colour page in normal mode took 77seconds. Results for colour were rich and vibrant, but black output was appallingly blotchy.

Unfortunately, this poor handling of black output continued when we tested the copier functions and our mono copy suffered severely from fading and banding, although colour results were much better. Another problem we found with the copy function was that it curled the paper so badly that even after a week the pages we copied still didn't lie flat.

The 30-bit scanner supports a maximum resolution of 600 x 2,400dpi optical, or 9,600dpi interpolated – and it was fast, easy to use, and rendered excellent results. Bundled OCR software allows you to convert

scanned documents into editable text.

The OfficeJet can serve a small office, as a standalone copier, a network printer and scanner by connecting it up via an HP JetDirect print server.

URSULA TOLAINI



JUST ADD A PC FOR AN ALL-IN-ONE HOME OFFICE

## PCW DETAILS



**Price** £399 (£340 ex VAT)

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

**System requirements** Pentium 90MHz for Windows 95 or 98, Pentium 133MHz for Windows NT 4.0, 32MB of RAM, 50MB of hard disk space, bi-directional parallel port

**Good points** Good-quality colour printing, low cost

**Bad points** Poor black printing, curls paper

**Conclusion** A cheap way to get all the office tools you need in one compact unit. Colour printing and scanning are impressive, it's just a shame we can't say the same for black output

# Philips Nino 500

A stylish Windows CE handheld which offers Calligrapher handwriting recognition software.

The ground-breaking, pen-driven Palm Pilot handheld has tended to overshadow the many rival designs it inspired. Its major selling points were usable (though imperfect) handwriting recognition, and easy synchronisation with

desktop data via a neat, bundled docking station.

Both these features come with the Windows CE-based Nino 500, the latest version of Philips' answer to the Pilot. It differs from the earlier, monochrome

Nino 200 mainly in having a colour 320 x 240 screen, a considerable improvement because colour does improve readability.

Synchronisation, via a docking station linked to a desktop host's serial port, is foolproof and relies on the CE extensions to Windows 9x. For handwriting recognition you get a choice of CIC's JOT for printed text, or Paragraph's Calligrapher.

The latter makes a stab at reading your normal, joined-up handwriting and its performance is impressive, but fallible. People with a regular, clear hand may find it very useful; others may resort to the Nino's soft keyboard. Still, Calligrapher is a step on from the Palm's Graffiti system, which requires a particular way of writing.

In addition to the usual organiser applets, including Microsoft Outlook, you get a voice recorder and player, a sketchpad, a jotter, and fax software –

though a click-on modem has to be bought separately.

A Compact Flash II slot allows you to expand the standard 16MB of RAM. It should also take one of the many CF II devices that are starting to hit the market – including IBM's 340MB Microdrive.

Some non-volatile storage is advisable as well, since some of the software is a little flaky, and we had to reset a couple of times. Otherwise, this is a useful and elegant design.

CLIVE AKASS

## PCW DETAILS



**Price** £304.34 (£259 ex VAT)

**Contact** Philips 0800 961445  
[www.philips.com](http://www.philips.com)

**Good points** Comfortable and easy to use

**Bad points** Biased for right-handers

**Conclusion** Stylish and useful



# Xircom CompactCard Ethernet 10

Networking hardware that will be **welcomed by speed freaks** with Windows CE devices.

The CompactCard is a network card for Windows CE devices, and compact it most certainly is. Considerably smaller than a matchbook, it slots into the tiny Type II CompactFlash slots found in CE machines such as the Philips Nino (see *previous review*). However, it also comes with a cradle into which it can be slid for use in machines fitted with PC Card slots, such as the Hewlett-Packard Jornada 820.

WinCE machines typically connect via a serial line to a host PC running CE Services. This serial connection can be used to exchange files between the two machines, synchronise diaries and so on.

This Xircom card allows the WinCE machine to connect to its host across a network. In fact, you don't even need a hub. Given a network card in the PC a cross-over cable can be used to connect the two directly.



However if you do connect in to the network via a hub, and if you are running CE Professional, then further delights are in store. You should also be able to

synchronise email directly with the corporate server, although in some cases you may need to purchase third-party software. In addition, you should also be able to use Pocket IE to access

shared Microsoft network devices and directories.

Attaching a CE machine via a network connection offers appreciable speed gains: you can synchronise files, Xircom says, 200 times faster than with a 56k serial connection.

The card comes with BatterySave to manage power consumption and it allows connection to a 10 or 100Base-T network, though the card will only run at the lower of these speeds.

MARK WHITEHORN

## PCW DETAILS



**Price** £89 (£75.75 ex VAT)

**Contact** Xircom  
00800 7070 6060  
[www.xircom.com](http://www.xircom.com)

**Good points** Well-designed and adaptable hardware

**Bad points** None to speak of

**Conclusion** A must for dedicated speed freaks

# Adaptec SlimSCSI 1460

A SCSI interface for Windows CE **giving access to unlimited storage** via a Type II slot.

Although PC Card Type II SCSI adaptors aren't new, this one is generating renewed interest with its recently launched support for Windows CE.

At first sight, a SCSI interface for CE has a bizarre ring about it, but for Adaptec it was a natural development: its existing laptop technology required only a CE driver to create a new niche for the SlimSCSI card. And for WinCE users it is a boon, since they can now access almost unlimited storage space via their Type II slot.

The most likely device WinCE users will want to attach is a Jaz or Zip drive; so we tried a Zip 250MB. Unfortunately, of the two cables that come with the card, one was a 50-pin low density and the

other a 50-pin high density (for SCSI I and II respectively). The Zip drive had only an older 25-pin connector. Adaptec is behaving perfectly reasonably in supplying the newer type of connector and will, in addition, supply a 25-pin cable free of charge if you return the form included with the kit.



Installation is simple: connect the WinCE machine to a PC running CE Services, run the Adaptec setup program on the PC, attach the card and drive, reboot the WinCE machine and all should be well. The disk appears under 'My Computer' as removable storage.

Additional drivers for CD-ROM devices have just been written and should be available with the card as you read this.

SCSI technology has the advantage of a rapid data transfer rate (Adaptec quotes it as six times faster than via a parallel port) and it's also possible to run programs from the external drive.

The other SCSI plus point, the ability to daisy-chain multiple devices, is sadly not supported when the card is used with CE.

MARK WHITEHORN

## PCW DETAILS



**Price** £115 (£98 ex VAT)

**Contact** Adaptec 01276 854500  
[www.adaptec.com](http://www.adaptec.com)

**Good points** Massive storage for WinCE machines

**Bad points** Cable confusion: if you need a 25-pin connection, order it at the same time. Also remember that your WinCE machine may not run the SCSI card without mains power

**Conclusion** Nice one Adaptec

# Lotus SmartSuite 9.5

**Saving money on an office suite doesn't mean compromising quality features.**

The latest Lotus SmartSuite is a feature-rich office suite that typically costs substantially less than Microsoft Office, its obvious rival.

The core components are the WordPro word processor, 1-2-3 spreadsheet, the Freelance Graphics graphics presentation application, and Approach database manager. Supplementary applications include the Organizer PIM, FastSite web publisher and the SmartCentre utility for quick access to all the features of the suite. You also get IBM ViaVoice speech dictation, complete with headset and microphone.

If you already have SmartSuite Millennium 9.0, you will not find a lot new here, the notable exception being Organizer 5.0 which has much improved contact management features and support for Internet standards like vCard, vCalendar and LDAP (Lightweight Directory Access Protocol).

A version number of 9.5 gives you a clue as to how old most of these applications are. The main packages are mature and refined, and more than adequate for typical office tasks. The key questions are, first, whether SmartSuite is a better productivity tool than the competition, and second, how useful are its leading-edge features such as voice dictation and web publishing?

**SmartSuite's scope** is not as broad as Microsoft Office, but it does have its advantages. One is the context-sensitive InfoBox, a tabbed property editor that remains open as you work. WordPro has become a pleasure to work with, with strong layout features and useful touches like click-here blocks - the ideal way to create documents that prompt the user to complete them correctly. Special views are another sensible feature, displaying documents in a split window that lets you edit a document without losing sight of its overall structure. There is no room here for a list of features, but the point is that SmartSuite applications do have distinctive advantages.

Organizer has always been the most intuitive PIM thanks to its faithful



reproduction of a paper-based organiser. Unlike Microsoft Outlook, it does not handle email, nor does it have Outlook's custom forms. In compensation, Organizer loads faster and is easier to use.

Lotus SmartCentre betters the offerings from Corel and Microsoft as a suite manager. Rather than a simple toolbar, it docks to the side of your screen and offers pop-out sections called drawers. One drawer has shortcuts to SmartSuite applications, another has addresses, and a third is an instant dictionary and thesaurus. The most compelling drawer is called Internet, with links for news headlines, stock quotes, weather and more. Sadly, it is hard to dissuade SmartCentre from constant dial-up attempts and there is a strong US bias to the information. But having said that it is still an appealing accessory.

FastSite is a quick website builder. You select SmartSuite or other documents to add to a site, and FastSite automatically converts them to HTML. The only options are high-level choices like choosing the overall look of the site, and selecting which HTML converter to use. If you have the Lotus Domino server, then extra features like full-text search become available. FastSite is unexciting and too limited, in contrast to Microsoft's far-reaching intranet support in Office 2000.

Both SmartSuite and Corel's WordPerfect Suite are ahead of Microsoft in voice input. ViaVoice is integrated with WordPro and 1-2-3.

Installation is straightforward, and it is easy to get going with dictating documents, but when running it's a processor hog.

◀ **ANOTHER BAD MONTH, FAITHFULLY ANALYSED BY 1-2-3 AND SHOWING THE DISTINCTIVE INFOBOX**



▲ **SMARTCENTRE GIVES ONE-STOP ACCESS BOTH TO APPLICATIONS AND TO INFORMATION AND FROM THE WEB**

Currently, we aren't convinced of its value unless you have special reasons, such as if you have RSI, to prefer voice input. It is hard to assess though, since results vary according to the sound of your voice and the time you invest in training the

system. The main problem is that making corrections is tedious, usually involving mouse and keyboard. Voice dictation errors are worse than typing errors, and won't be picked up by a spell check as the system always finds real words.

**Although Microsoft Office** has more to offer, SmartSuite has strong attractions. Finding old-style Windows help is a relief after enduring the monstrous Office 2000 help system. Approach is far less capable than Microsoft Access, but also less intimidating for database beginners and comes as standard.

Frankly, unless you need some particular feature of Microsoft Office, or compatibility forces you into it, SmartSuite is far better value.

TIM ANDERSON

## PCW DETAILS



**Price** £410.08 (£349 ex VAT) £175.08 (£149 ex VAT) upgrade

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

**System requirements** 486 with Windows 95, 98 or NT, 29MB disk space, 16MB RAM. For ViaVoice, a sound card, 48MB RAM and 110MB disk space

**Good Points** Excellent core applications, imaginative SmartCentre, value for money  
**Bad Points** Content has a US bias, poor for web authoring, Approach and Organizer are lightweight applications

**Conclusion** A high-quality and user-friendly office suite



# Web Page Construction Kit 5

## Online publishing software

MediaGold's latest offering is a deluxe kit with all the **tools you need** to get noticed on the net.

**S**imple enough to appeal to the first-time web author, this collection of diverse packages should still be of use to even the most experienced online publisher.

Sites can be created either as a whole or on a page-by-page basis within the Web Express module, and further options allow you to work from scratch, gather together a collection of pages already in existence or base your new site on a theme. Although there's a wide range of such themes and they are organised in a series of descriptive categories, none of them is anything special and anyone coming across a page on which they were used is unlikely to think they are your own original work.

The new site wizard takes you through the creation of your new site, but when it comes to entering the FTP details less experienced users may be somewhat baffled, as there is a general expectation that they should already know what they are and where to find them. That complete, the graphics of each theme can then be customised to match your particular needs. Right clicking on each graphic calls up a context-sensitive menu that takes care of changing the text as required.

This is not the only time-saving feature within Web Express. Almost every function can be quickly accessed through the button bar running across the top of the screen and is then adjusted within a tabbed palette.

**Web Express has excellent** form handling capabilities. If you don't want to start from a blank space, you can select from a number of pre-defined forms that can be tailored to meet your particular requirements.

The range includes not only the more usual options, but also site redirection menu forms and simple ecommerce handling forms for gathering credit card information. It will also provide you with the necessary CGI script for implementing your form on the net and drop it into the appropriate directory.

We had only three minor gripes

about Web Express. First, if you've chosen to base your website on a theme, every page you then create will be based upon it – there is no option to make a single page that differs from the norm.

Second, you can't edit the HTML code directly from within Web Express – instead it has to shell out to the external text editing application you specified during the setup phase.

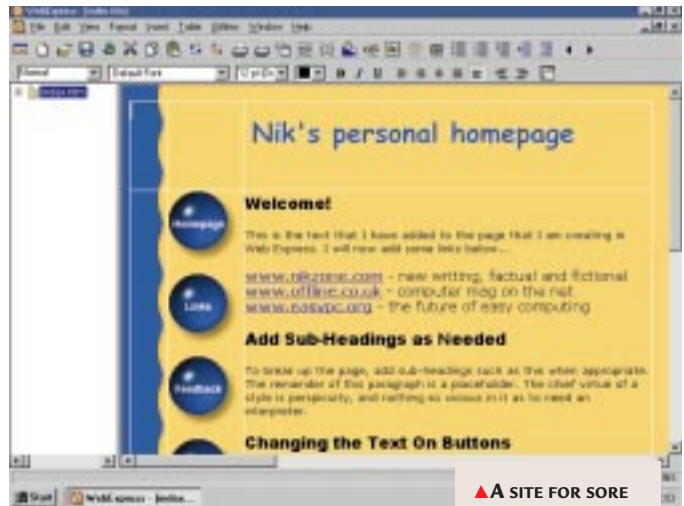
Third, although its excellent handling facilities mean that creating frames is no longer something to be feared, once we inserted a document into a frame we found it rather difficult to change the frame attributes.

**The other two** principal packages included in the kit are Totally Hip Web Painter 2 and NEC Auraline. The first of these makes short work of generating animated GIF files for use on your site. It can be set as the default image editor for use with Web Express, so it benefits from good integration.

Animation creation is facilitated through onion-skinning and optional snapping, but we found changing any of the text placed within our image to be unnecessarily awkward – dropping the cursor in one location did not necessarily mean you would start typing there, and characters often appeared one space to the right.

Animations can be exported as AVI files, which we liked, but we were a little bit disappointed that our tool tips popped up behind the tool palette, making them impossible to read.

Auraline takes your animations, sounds and images and melds them into



▲ A SITE FOR SORE EYES – GETTING TO GRIPS WITH WEB AUTHORING HAS NEVER BEEN EASIER

a web or PowerPoint multimedia presentation working on a timeline basis – rather like a simple version of Shockwave.

Motion and mouse rollover effects can be easily implemented and saving your work writes to your drive an HTML file incorporating the necessary Java applet for playing it back in a web browser.

All in all, this is a simple to understand, good value package that will appeal to the web publishing novice and offer something of value to the expert at the same time.

NIK RAWLINSON

### PCW DETAILS

★★★★★

**Price** £49.99 (£42.54 ex VAT)

**Contact** MediaGold (UK) 0171 372 9762  
[www.mediagold.com](http://www.mediagold.com)

**System requirements** Pentium processor, Windows 95/98 or NT4.0, 16MB RAM, 30MB free hard drive space, double-speed CD-ROM drive, Microsoft Internet Explorer 3.02 or later

**Good Points** Simple to use, great for beginners

**Bad Points** Frames can be difficult to change once filled, no integrated code editor

**Conclusion** Good for beginners, but don't expect to be able to build a portal with it

# Sybase SQL Anywhere Studio

A database software suite friendly enough to **run on any platform** is bound to be popular.

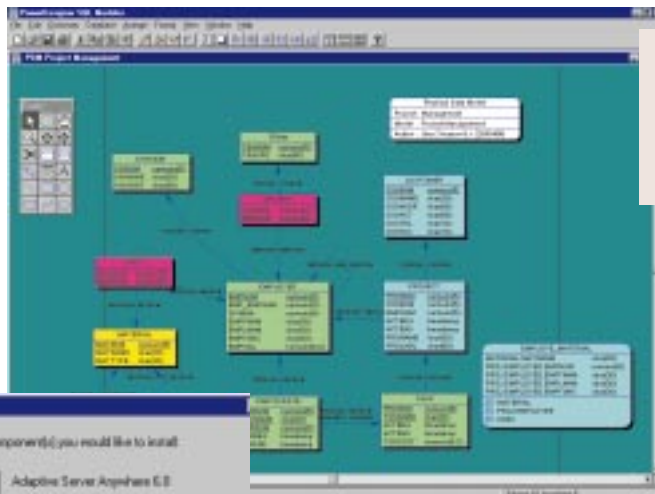
During the early 1990s Sybase was one of the really big names in the database world, but now it trails far behind the likes of IBM, Oracle, and Microsoft. However, one area in which the company still leads is that of mobile computing – that is, the generation and maintenance of databases on handheld devices (laptops, Windows CE devices, palm machines etc).

These databases are typically sub-sets of the data that is held in the corporate database and users of the handhelds expect to be able not only to read data on the handheld but also to edit and even add information which can then be synchronised back to the corporate database at a later date.

In order to run such a database on, say, a Windows CE device you need an RDBMS engine which is capable of running on that platform. Sybase's flagship RDBMS is called Adaptive Server and the company has recently launched a version of Adaptive Server for WinCE.

The engine is tiny so it is able to fit within the diminutive memory space of the WinCE device, which in turn means that it is quite literally a database engine. It has no extra administration utilities (which is why this article has no screen shots of the engine running on WinCE – there is nothing to show).

**You can't use** the WinCE database engine to create or develop a database on the WinCE device. For that you need Adaptive Server on another platform (typically Windows NT or 95/98). In order to carry out that development it is likely that you will require some other development tools, so Sybase provides a product called SQL Anywhere Studio, which has copies of Adaptive Server for different platforms (including both NT and WinCE).



◀ **SQL MODELER IS A REMARKABLY USEFUL TOOL FOR DESIGNING DATABASES**

WinCE machine against the database. Once it is tried and tested it can be compiled and shipped down to the WinCE machine.



▲ **THERE'S PLENTY TO GET YOU GOING ON THE EVALUATION CD**

It also includes SQL Modeler (a database design tool), Infomaker 6.5 (a reporting tool which is based on

PowerBuilder allowing end users to create ad hoc reports and also enabling more competent DBAs to create pre-built reports) and Powerdynamo, aimed at the intranet world. This allows you to deliver dynamic, data-driven web pages. Since the actual HTML pages are stored in a database these can be synchronised down to the handheld device.

**So how do you use** SQL Anywhere Studio in practice? Assuming that you have an NT machine, both versions of Adaptive Server need to be installed on the NT machine and the install for WinCE also offers to move the necessary code down to a WinCE device at the same time.

You can then develop the database on the NT machine using the tools provided. It may be prudent to structure the database to facilitate the later sub-setting of the data to different WinCE devices (that is, give the relevant data to the relevant person rather than giving all the data to everyone). You can, of course, use the extra tools, such as SQL Modeler, to speed up the development.

Once the database is up and running, you use something like Microsoft's visual C++ to develop the application for the

**One of the strengths** of the Studio is that, as it is composed of components, it is highly versatile. We have only covered a few of the options available, but, for example, SQL Anywhere will work with any ODBC-compliant RDBMS engine on the server, not just Adaptive Server. So if your corporate database is on another engine you should still be able to use the Studio to deploy mobile databases. In addition, you can also develop for platforms such as the Palm.

However, a downside which is partly a result of this fragmentary nature, is that producing a working mobile database is still not a trivial task. It requires a range of different tools and skills and is likely to take time and effort – on the other hand, the potential rewards are great.

If you have a yen to give it a try, contact Sybase at the number below and it will dispatch a 60-day evaluation CD of SQL Anywhere Studio.

MARK WHITEHORN

## PCW DETAILS

★★★★

**Price** Single-user £305.50 (£260 ex VAT), five-user £775.50 (£660 ex VAT)

**Contact** Sybase 01628 597390  
[www.sybase.com](http://www.sybase.com)

**System requirements** 486 processor, 16MB RAM, 70MB hard disk space, CD-ROM drive

**Good Points** Produces mobile database solutions for a range of handheld devices

**Bad Points** Still requires a propeller-head at the joystick

**Conclusion** It's versatile and powerful but not for the faint-hearted

# Print VS electronic publishing

From cave paintings to satellite communications, people have always wanted to get their message across. But what's the best way to do it? Graffiti is frowned upon and only mad-shouty people stand on top of boxes in Hyde Park.

You could use desktop publishing to produce a document, then post print-outs to the desired recipients. But wouldn't it be better still to cheaply and quickly post material onto the web to a worldwide audience? Then again, there's nothing like picking up a sheet of paper or a magazine and reading it wherever you like.

It's another classic dilemma, and therefore fair game for *PCW's Head to Head*. Over the next three pages we'll delve into the pros and cons of publishing your material whether electronically or on paper.

## Content preparation

Images require different types of preparation for electronic and print publishing. As far as print is concerned, make sure your image is of sufficient resolution, and perhaps apply some colour correction.

Images on the web, however, need more work. Not only do they have to be of lower resolution in order to appear quickly, but you should also apply a variety of compression tricks (often with trial and error) to get them smaller still. Even with packages like Adobe ImageReady to help, you'll usually be looking at more preparation time than for print. One-nil to the traditionalists.

## Layout

After 15 years of desktop publishing (DTP), print-based designers can accurately position elements on-screen and be confident they'll be where they left them when the page comes out of the printer. You could opt for high-end packages such as Quark XPress or Adobe InDesign, or budget applications like Microsoft Publisher or Serif PagePlus and still pretty much guarantee your output.

Packages such as Macromedia DreamWeaver, Adobe GoLive and Microsoft FrontPage offer equally simple layout tools for web publishing. They



▲ THE AUTHOR'S WEBSITE CREATED WITH MACROMEDIA DREAMWEAVER 2. ORIGINAL DESIGN AND LAYOUT TOOK THE BEST PART OF A DAY, WHILE WEEKLY UPDATES TAKE APPROXIMATELY TWO HOURS. NEW CONTENT IS UPLOADED USING A 56K MODEM IN MINUTES DURING BT'S CHEAP WEEKEND CHARGES. THE SITE IS HOSTED BY EASYSPACE WHICH PROVIDES 100MB OF WEB SPACE BUT NO MULTIMEDIA STREAMING FOR £72 PER YEAR. THE [WWW.GLNOW.COM](http://WWW.GLNOW.COM) DOMAIN WAS REGISTERED WITH NETWORK SOLUTIONS FOR £25 A YEAR

allow you to draw boxes, fill them with text or pictures, then resize or generally shift them around as desired. Software for both the web and print also allows you to define templates and styles to make subsequent issues a doddle to create.

So, print and web publishing tools really are as simple to use as each other. But anyone who has enjoyed the absolute precision and virtually limitless control of DTP will quickly stumble with web layout. Sometimes it's simply a case of learning how a different medium handles overlapping material or runarounds, but even taking familiarity into account, DTP for print publishing has the edge for ultimate layout flexibility; one-nil to print.

## Quality of document

Ever wondered why the text on every web page consists primarily of just two fonts? It's because Times and Arial/Helvetica are all you've got if you want to retain any level of compatibility across browsers. You can change their sizes, but if you want to use any different fonts, you've got to render them as graphics and use them in the same way as, say, a photo. Once turned into a graphic, the type will lose all of its editable and searchable text attributes as well as incurring an undesirable download time. Compare that to DTP, which will happily apply any

installed font style to words, while still retaining its text characteristics.

Websites are typically viewed on monitors with resolutions of between 70 and 100dpi. Whatever your chosen print technology, you're looking at considerably higher resolutions than on-screen web publishing, which quite simply translates into smoother edges, greater detail, and more accurate representations of your content. But what about seeing your content in colour? It's fair to say there are many more colour monitors out there than colour printers, so one point each here.

Electronic publishing also boasts a unique ace card: the potential to handle audio and video content, and it's getting better every day. There's also the possibility of interactivity that a sheet of paper can only dream of. Two well-earned points here.

Impact is another matter. Which is the more attention grabbing between a high-resolution photograph on a glossy

sheet of paper, or a web page packed with audio and video? A tricky one which we'll have to call a draw.

But what about the actual reading experience? You've got to the end of page one and want to continue. If your desired web page is packed with pictures, you could be waiting a good few seconds to see it, whereas paper-based documents can be instantly flipped over regardless of content – of course it's obvious, but responsiveness is a big deal in the reading experience. Three-all in this round.

## Reader environment

Is your typical reader tied to a computer or running down the street trying to find an address? The beauty of print publishing is that you can easily take it wherever you like, for free. Techno-philics could play the card of notebooks and PDAs, but they simply can't win against paper in terms of size, weight, battery life and general portability. You could, of course, print out your electronic document, but paper documents have always had these qualities.

On the web side of things, let us assure you that however carefully you prepare your pages, they will look quite different on other people's machines. Using different browsers under a variety of platforms, text may appear in different sizes with undesirable reflow, tables can cause quite significant repositioning of content, and colour could turn out much darker or lighter than intended. At least when you print out your DTP documents, you know how they're going to look before sending them out.

While the viewing conditions can be highly variable with electronic publishing, at least content prepared on a monitor will be viewed on a monitor. Images remain in the nice vibrant RGB format all the way from preparation to final viewing, whereas for colour print you'll be converting into the comparatively restricted CMYK format and losing all those bright electric shades. It's still two-one to print though.

## Availability

Duplication and distribution are crucial considerations in publishing. In terms of print, this simply means outputting as many of the documents as you require, binding or stapling as desired, then actually getting them out to your readers, whether by hand, post, or in the case of national magazines, to newsagents across the country. It's an



expensive and time-consuming business.

Web publishers, however, only have to upload their content onto a suitable server, and sit back in the knowledge that anyone in the world with an Internet connection can see it seconds later. Duplication and distribution? No thanks. Two easy points for the web.

Now let's say you want to read something in *PCW*, but you've not bought the issue, it's midnight, the shops are closed, and besides, you're in Kuala Lumpur and they never had it in the first place. If the content was on the web, and you had a connection to the Internet, you could access it at any time, any place, anywhere.

Even if the shops were open, how quickly could you find the actual story you were looking for? On the web you could perform a search and quickly find relevant content, wherever it may geographically reside. Searchability is a key advantage for any kind of electronic publishing, and in this section, the web wins a landslide four-nil victory.

## Cost and effort

Web and print publishing software packages cost around the same, from £50 for a basic system to £500 for a professional one. Obviously for print you'll need your own printer or access to someone else's. Basic A4 lasers and colour inkjets are available from £200, or you could look into approaching a local bureau for higher-quality output. When using a third party, ensure they have the same software and fonts as you do.

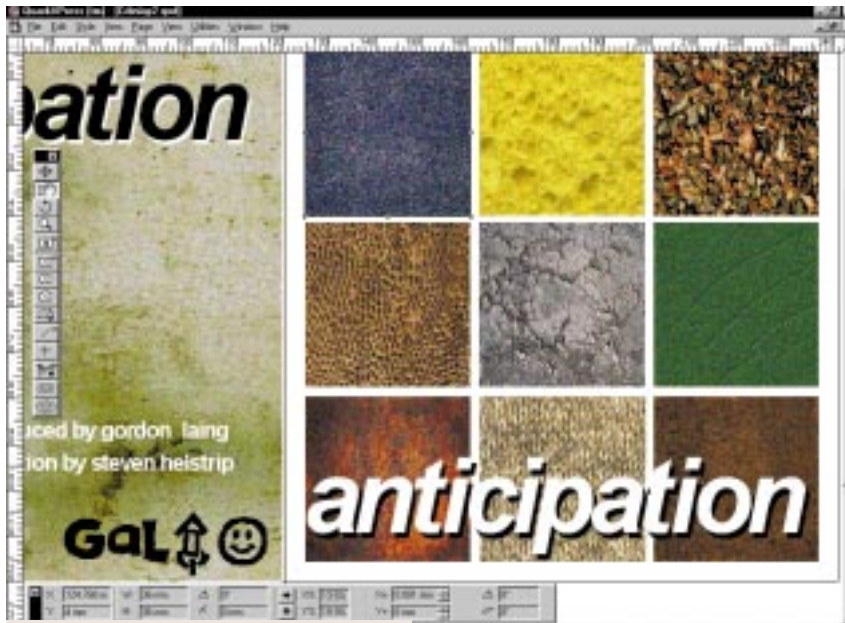
Web publishers will need space on a server permanently connected to the

▲ **ADOBE PHOTOSHOP IS THE IMAGE MANIPULATION AND PREPARATION PACKAGE OF CHOICE FOR PROFESSIONAL DESIGNERS WHETHER IN PRINT OR WEB PUBLISHING. THE LATEST VERSION 5.5 INCLUDES IMAGEREADY 2.0 WHICH SIGNIFICANTLY IMPROVES TOOLS FOR OPTIMISING IMAGES FOR ONLINE USE**

web. Most ISPs offer something in the region of 25MB of space with cheap or free dial-up accounts, which should be sufficient to get started. You should also consider registering your own unique company domain name for around £25 a year, which will improve your professional appearance.

Be aware that not all web servers are created equal. Many are frequently taken down for a few hours per week for maintenance, which is no good when your readers are trying to have a look. Multimedia content is all very well, but many web servers aren't running the extensions which allow them to stream video and audio. Those that do may only allow one or two simultaneous streams. Most ISPs also place restrictions on commercial activities or numbers of hits allowed on a site they're hosting. If web publishing is your thing, make sure you ask these questions before signing up.

Web pages may take about the same time to prepare as those for print, but once completed you can get them on your site and available to your readers in a matter of seconds. A web page may measure from one to 20Kb, and feature a couple of 40Kb images. With an average modem connection, you're looking at about 25 seconds to FTP 100Kb of data to your site, after which anyone in the world can access it. BT's most expensive



▲ **QUARK XPRESS REMAINS THE DOMINANT PACKAGE FOR PRINT LAYOUT, ALTHOUGH ADOBE INDESIGN MAY MAKE INROADS OVER THE FOLLOWING MONTHS, PARTICULARLY WITH NEW, SMALL BUSINESSES. BOTH PACKAGES OFFER EXTREMELY ACCURATE POSITIONING OF CONTENT ALONG WITH HIGHLY CAPABLE TOOLS FOR OUTPUT TO PRINT. HERE IS ONE OF THE AUTHOR'S CD INLAY DESIGNS**

analog rate is four pence per minute, so you do the sums.

It may also only cost pennies to quickly run off a load of laser prints, but colour inkjets can be expensive and slower to run, not to mention the environmental guilt you'll suffer about trees and chemicals with any kind of printing. It's when you begin to incur delivery costs that the speed and cheapness of web publishing really begins to sound attractive.

The sheer speed of the web allows people to produce news sites that are updated literally every few minutes, and if that's what turns you on, then forget about print. However, regular visitors to websites expect them to be updated frequently, and one that's left to go stale, even for a few days, is unlikely to be revisited. Web publishers certainly need to be committed. At least with print you know that, once the document is finally out the door, you can relax for another week or month.

However, don't become too obsessed with your own costs – consider your readers' first. A posted print document has cost them nothing, whereas time spent on the Internet results in charges for them, along with the disadvantage of requiring access to a computer in the first place. In this round of complex

issues, the speed of web publishing draws with the cheapness and safe disposal of print to your reader.

### Conclusion

In this head to head, web publishing wins eight-seven, but if your target audience don't all have regular access to computers and the Internet, then forget about it. Also, if your readers use your

material on the move or in unusual environments then stick with print, or at least make sure your web pages look good when output on a common monochrome laser.

Do consider some kind of basic web presence though. It's infuriating to call a business after 5.30pm just to ask their address or fax number and find them closed. This sort of basic contact information, along with mission statements or public reports on the web, can ensure your business has a 24-hour availability. If you're going to take it further and enjoy the prospect of updating content quickly, then prepare yourself to do it regularly, or at least remove time-sensitive content. Paper will get thrown away when out of date, but a web site will tragically proclaim last summer's news for the rest of time if you don't remove it.

At the end of the day, paper is not going to go away. It's cheap, highly portable, offers great quality and people simply like it. However, we would recommend every business has some kind of web presence to at least solve the contact issues described above. There are plenty of potential customers who'll check you out electronically before even calling in person, so make sure you've got something good for them to look at.

GORDON LAING

## The best of both worlds?

If you like the sound of easily searching through colourful electronic documents, but don't fancy the idea of posting content on the web, then why not consider physically emailing or posting electronic documents? This could be as simple as sending a PowerPoint

presentation on disk, or emailing a report made in Word.

However, to ensure missing fonts don't cause poor appearance and reflowing incidents, consider publishing your documents using Adobe Acrobat. Its portable document format (PDF) was designed to do away



with the worries of ensuring a page looks the same on Macs and PCs, regardless of which fonts had been installed. Try PCW on CD, a disc with two years of complete editorial content, entirely searchable, in colour, and ready to print out if a hard copy is desired. Surely the best of both worlds.



# Service & Reliability survey

PCW READERS HAVE ONCE AGAIN **DELIVERED THEIR VERDICT** ON THE BEST BRANDS IN THE DESKTOP, NOTEBOOK, HANDHELD AND PRINTER MARKETS.



**B**uying a new PC is a nerve-racking experience even for the most knowledgeable buyer. For every trouble-free purchase you hear about, it seems there's a tale of woe to match it. Not only are there all those different brands and models to choose from, but there are many other aspects of the purchase to consider.

Trustworthy advice is of paramount importance. As a potential buyer, you need to know whether a company has well-trained sales staff who will give you the right advice on your requirements, or whether they will give you the hard sell and try to push you into buying extras you don't really need.

Once you've chosen your make and model you need to know whether it will arrive when the company promises it will, and that everything will be complete, correct and in good working order. And as there's always a risk that problems will occur when you use your PC, you also need to know what the quality of the company's support staff is like. How knowledgeable are they? How easily do they diagnose problems? How good are their solutions likely to be?

However, in the long run these questions are less important than how reliable your PC is. If you use a PC for your business, any time that your machine is out of action means you also cannot work and potential revenue is lost. So it pays to buy from a firm that builds durable PCs.

To help you sort the wheat from the chaff, *PCW* presents its second annual independent service and reliability survey. To find out which companies *PCW* readers rate as the best, we polled the readers of our May issue, asking detailed questions on a raft of issues. We received 2,362 responses to this year's survey, a significant increase on last year's response. As with last year, we looked at desktops, notebooks, handheld PCs and printers.

In conjunction with market research firm Maritz Research, we have gathered information on the processor type, cost of purchase, what the PC is used for, warranties and extended warranties, the attitude of sales staff, reliability of the machine, and the helpfulness and efficiency of support staff. We've also gathered data on customer loyalty - how likely our readers would be to repurchase a brand or recommend it to friends and colleagues.

## HALL OF FAME

### Desktop PCs



**Overall Reliability:**

1999 Winner: Mesh

Commended: Dan, Dell



**Repurchasing Brand:**

1999 Winner: Dan

Commended: Mesh, Dell

### Notebooks



**Overall Reliability:**

1999 Winner: Toshiba

Commended: IBM



**Repurchasing Brand:**

1999 Winner: Toshiba

Commended: IBM

### Handhelds



**Overall Reliability:**

1999 Winner: Psion

Series 3



**Repurchasing Brand:**

1999 Winner: 3Com

(PalmPilot Pro)

### Printers



**Overall Reliability:**

1999 Winner: Epson

Commended: Hewlett-Packard



**Repurchasing Brand:**

1999 Winner: Hewlett-Packard

Commended: Brother



▲ **HANDHELD  
WINNER:  
PSION 3**



▲ **WINNER:  
MESH  
DESKTOP PCs**

▲ **WINNER:  
EPSON  
PRINTER**

▲ **WINNER:  
TOSHIBA  
NOTEBOOKS**

## Contents

- 118** Survey trends and methodology: which suppliers are included and how we conducted the research
- 121** Section one: Desktop PCs
- 127** Section two: Notebook PCs
- 128** Section three: Handhelds
- 130** Section four: Printers

- Research compiled by Maritz Research; Tel: 01628 895479
- Report compiled by Eira Hayward and Bobby Pickering

## Trends

So, first things first, where are the majority of you going to buy your PCs?

The competition between suppliers for customers is as strong as ever, but it seems that the superstores and high-street retailers are beginning to make slightly more of an impact on PC purchases. Our survey found that 19.7 per cent of you bought a desktop machine from a superstore or retailer this year, whereas last year the figure was only 17.6 per cent.

The direct and mail order channels are holding steady, however, as nearly two-thirds of you (61.5 per cent) bought your desktops direct or through mail order last year. This year the figure was just a little up on 1998 at 62.5 per cent.

There are, of course, an ever-growing number of retail outlets for PCs. Tiny and Time have already built up sizeable national chains, while direct sellers Evesham, Gateway and Mesh are busy developing theirs.

Most notably, only four per cent of our survey's respondents had purchased a PC through the Internet or by email.

With 17.2 million people in the UK now having access to the Internet (according to a recent report from Continental Research) and consumer confidence in purchasing goods online increasing all the time, this proportion should change dramatically in the next few years.

**What are you buying?** Most of our respondents had spent between £1,001 and £1,500 on their desktop PC and most had bought it within the last 12 months. The majority of desktop PCs were bought with a standard one-year warranty cover, although there were exceptions to this – more than 60 per cent of

**On the whole, systems are getting more reliable, though this is POSSIBLY AT THE EXPENSE OF the actual delivery deadlines**

Evesham's buyers bought a two-year warranty as standard. Extended warranties are not a popular option, with only 12 per cent of our survey opting for extended cover.

Despite such a competitive market, there is evidence that some suppliers are letting delivery dates slip. This year, 48 per cent of our total sample were very satisfied that their PC arrived on time; last year's figure was 55.4 per cent. However, this year 5.9 per cent were very dissatisfied, compared to last year's 3.9 per cent.

Similarly, there are more problems with the completeness of the delivery compared to last year. This year 56 per cent were very satisfied that their order was complete and correct; the figure was 62.4 per cent in 1998.

The number of very dissatisfied customers has also crept up in the last 12 months: this year 5.5 per cent were very dissatisfied; last year the figure was just 2.9 per cent.

But it's not the big names, such as Dell, Gateway and Time, that are causing this dissatisfaction, but that large section of suppliers called 'Other'. These are smaller suppliers which, when competing in such a ferocious cut-throat market, end up claiming fulfilment options that they cannot maintain.

**As far as the causes** of technical and mechanical problems go, the same sorts of areas appear to plague users year after year.

Among those readers who experienced problems with their purchases, four per cent were plagued by PCs which were dead on arrival, compared to five per cent last year.

In other problem areas there was hardly any change in reliability, the exceptions to the rule being sound cards (down from 14 per cent to nine per cent) and hard drives (down from 20 per cent to 18 per cent).

Perhaps the most encouraging trend to emerge is that the proportion of users who experienced problems has declined dramatically since last year's survey: this year it is down to 27 per cent, instead of 45 per cent.

On the whole, systems do appear to be getting more reliable, though this is possibly at the expense of the actual delivery deadlines.

## Methodology

As part of this survey, we have chosen the overall winners in the brand satisfaction stakes, after making allowances for the different numbers of respondents for each company. This has been done by calculating the average score across all brands and then showing readers' opinions about a specific brand as a comparison against this average score.

Our main Outline Charts (see pages 121-130) plot overall satisfaction with reliability, the likelihood to recommend, and the likelihood to repurchase for specific brands of PCs, notebooks, handheld computers and printers.

**Each chart is split up** into three coloured sections. The centre section contains all those brands which are considered to be similar overall to the average. The section on the right contains all those brands which are significantly better than the average and the section to the left contains all those brands which are significantly worse than the average brand.

The further to the right that a brand is found the better the readers feel about it in comparison to an average brand in general.

Similarly, the further to the left that a brand is found the less strongly the readers feel about it in



comparison to an average brand. Brands to the top right of the charts are the best in the opinions of the readers and those brands at the bottom left are the worst.

We have only plotted those brands for which there was enough data to provide a representative measure of readers' opinions. However, this has meant that some very well-known brand names, such as Panrix and Carrera, still did not register outside of our 'Other' category and so are not shown on our main charts.

**If a company makes** it onto the chart, even if it seems they performed badly, it is actually something of a recommendation in itself, as it indicates a market acceptance of that company.

Looking at some of the charts, it may seem as if Tiny, for example, is registering very badly, but it's important to remember that some of the companies in 'Other' could be doing far worse.

In addition, do bear in mind that some companies in the 'Other' category may have scored as well as – or better than – the overall winning brand.

## Acting on feedback

Manufacturers take the results of this annual PCW survey seriously, and if they register higher levels of customer dissatisfaction than expected, they take that feedback into account.

Tiny Computer's PR manager, Jim Buchanan, said that the company was surprised and disappointed by the survey results, as it aims to provide a consistently high level of service to customers. The company has also invested heavily in service and support, and now operates one of the largest PC call centres in Europe.

'We have spent more than £500,000 in the last nine months improving our customer support telephone system, to double the number of calls we can take simultaneously,' he said.

**'We have over 180 staff** in our customer call centre, taking over 5,000 calls per day. Ninety per cent of these calls are solved the first time. Including field engineers, Tiny's after-sales support team numbers 300 – an increase of 46 per cent in 12 months.'

A lot of support involves unfamiliarity with PCs. Buchanan said: 'Seventy per cent of our customer service enquiries are from customers who have opened the box and do not know how to set up their computer.'

'We understand this and we think it is our responsibility to help them get the best out of the product from first contact. This is why we have introduced a number of features to our systems that we believe lead the industry in ease of use for customers,' Buchanan argued.

He added that the vast majority of technical support calls concern software issues. 'These are

industry-wide problems, which every vendor and manufacturer is experiencing. We pride ourselves on the service that we provide for our customers, including those "hand-holding" enquiries for novice users.'

Buchanan said that the company has set itself very high standards, and that it monitors and measures its performance against these on a daily basis.

**'Although response times** can vary according to time of year and the time of day, our response times are consistently good, with an average wait of one minute 12 seconds in July 1999 – a 66 per cent improvement over July 1998,' he said.

He also pointed out that a Sunday opening

**If manufacturers in the PCW survey register higher levels of CUSTOMER DISSATISFACTION than expected, they do take that feedback seriously**

technical support line will be piloted by Tiny in the autumn.

Compaq also carries out constant monitoring of its service and support processes. The company's director for enterprise solutions and services, Gareth Cadwallader, said that problem areas and corrective actions are discussed at regular meetings of the company's UK management team.

**'We try very hard** to listen to our customers and, we believe, go to great lengths to help all of those customers who have genuine problems,' he added.

During 1999, Compaq has taken a number of actions to increase customer satisfaction with its products and services.

'Compared to the volume of products we ship each year – placed side-by-side they would stretch from London to Edinburgh – the number of returned units is remarkably low,' said Cadwallader.

'In response to this ever-growing volume of business, during the year we have significantly increased the number of staff dedicated to supporting customers, particularly on our warranty support line,' Cadwallader pointed out.

However, he added that the standard warranty may not be responsive enough for 'mission-critical' applications.

'We always urge any customers whose notebooks, desktops or servers are critical to their business to take out a Carepaq enhanced warranty,' he said.

The company has also set up a dedicated team at its Dublin call centre to help dissatisfied customers.

## Section one: Desktop PCs

We've selected some of the key areas of concern from the survey, which ranged over a variety of topics - from extended warranties to the specification of the machine purchased and the time taken to solve problems.

### Quality of advice

Dan's sales staff were rated particularly highly, as were those at Mesh: 41 per cent said they were very satisfied with the helpfulness of the Mesh staff, and 56 per cent of Dan's customers were also very satisfied.

The performance of companies with a poor showing overall, such as Tiny, was reflected in this question: 15 per cent of Tiny's customers said they were dissatisfied with the company's sales staff, and only 20 per cent said they were very satisfied. Similarly, companies which scored well overall typically had over 65 per cent of their customers either satisfied or very satisfied with the quality of the advice. Eighty-four per cent of Dan customers were either satisfied or very satisfied that staff understood their needs, while 76 per cent of Mesh customers said the same.

Scoring badly here were those manufacturers with retail chains, Packard Bell and Tiny. Only 34 per cent of Packard Bell clients were happy with the level of advice, and only 35 per cent of Tiny customers felt they had received good advice.

### Delivery issues

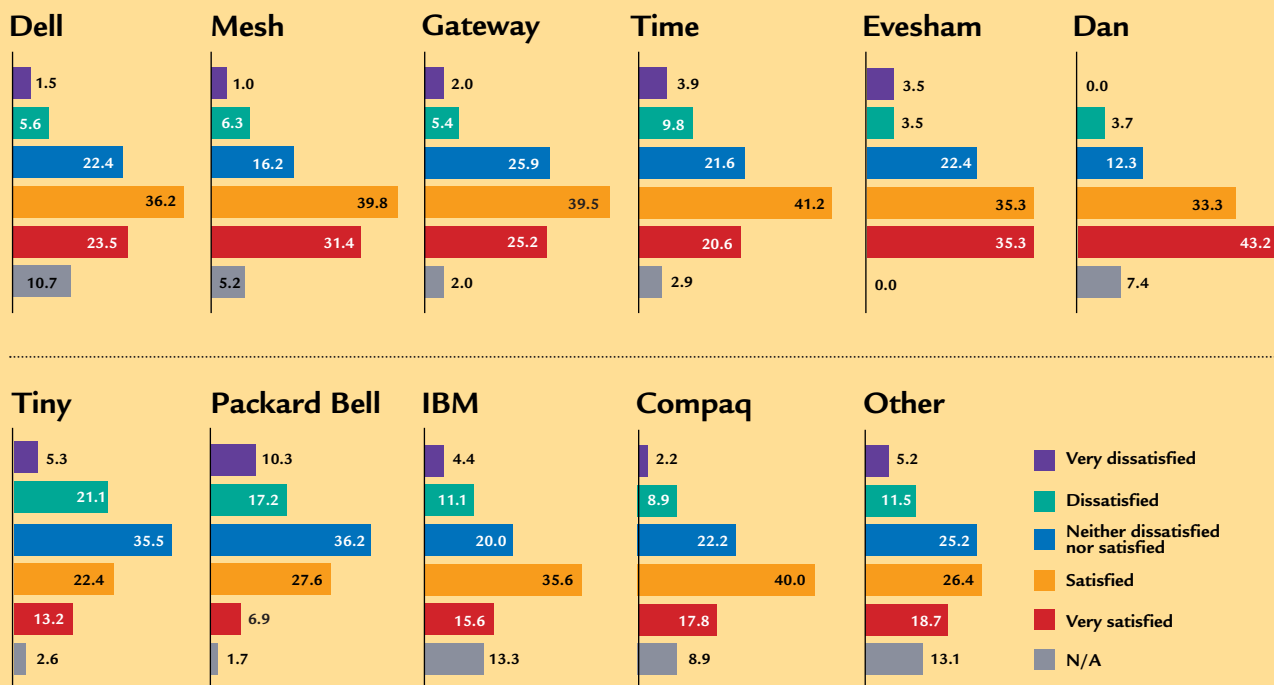
A key component in satisfying customer needs is to ensure that an order arrives on the date that the supplier promises it will. Faring the worst for systems arriving on time was Gateway, with 18 per cent of customers saying they were either dissatisfied or very dissatisfied. Dan customers were a very happy crowd in contrast, with only one per cent saying they were unhappy about the system not arriving on time. As for correctness and completeness, Time scored especially well, with only two per cent of customers unhappy with their order, and 95 per cent either satisfied or very satisfied that their order was correct and complete.

Meanwhile, 72 per cent of Mesh customers were very satisfied everything was in working order when they received it (see graphs on page 122). Also scoring well here were Time and Dan, each with 70 per cent of customers very satisfied. Compaq, which fared badly elsewhere in the survey, also performed well on this aspect, with 62 per cent of customers very satisfied that everything was in working order. However, IBM and Packard Bell scored badly here, with 44 and 53 per cent respectively.

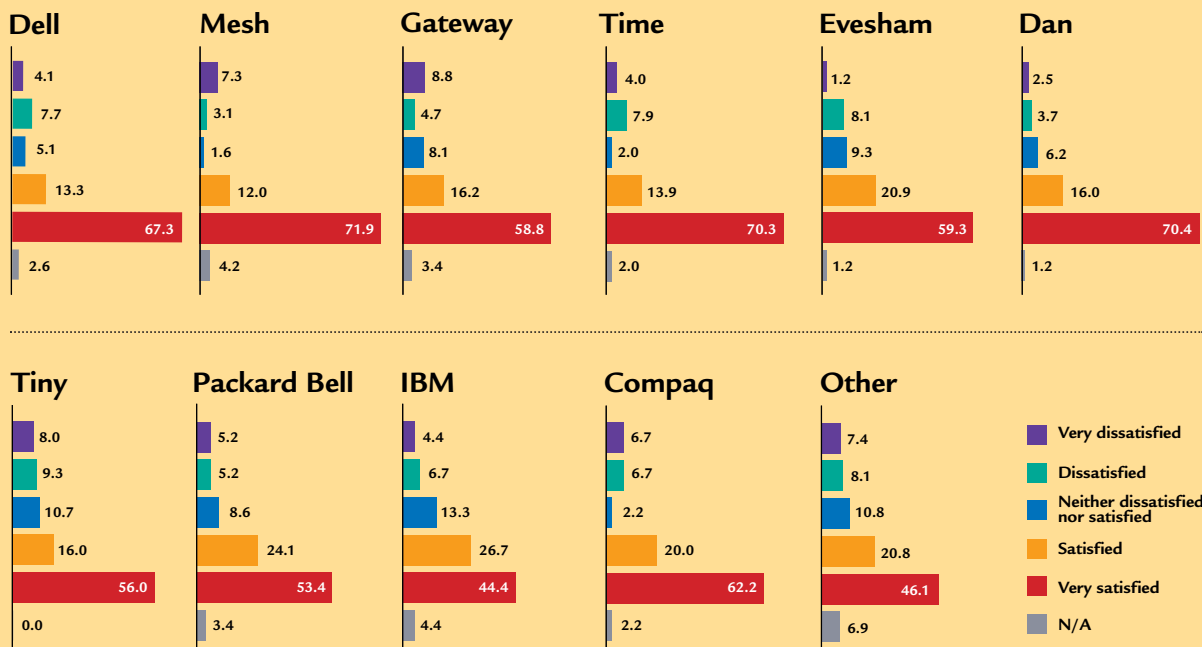


▲ ALL IN WORKING ORDER? MESH PCs SCORED HIGHLY

## QUALITY OF ADVICE



## EVERYTHING IN WORKING ORDER



### Solutions and support

There seems to be no overriding pattern as to the helpfulness and efficiency of support staff – the time taken to solve a problem and the usefulness of suggested solutions rather appear to be down to the quality of the staff employed by a company and the training they are given.

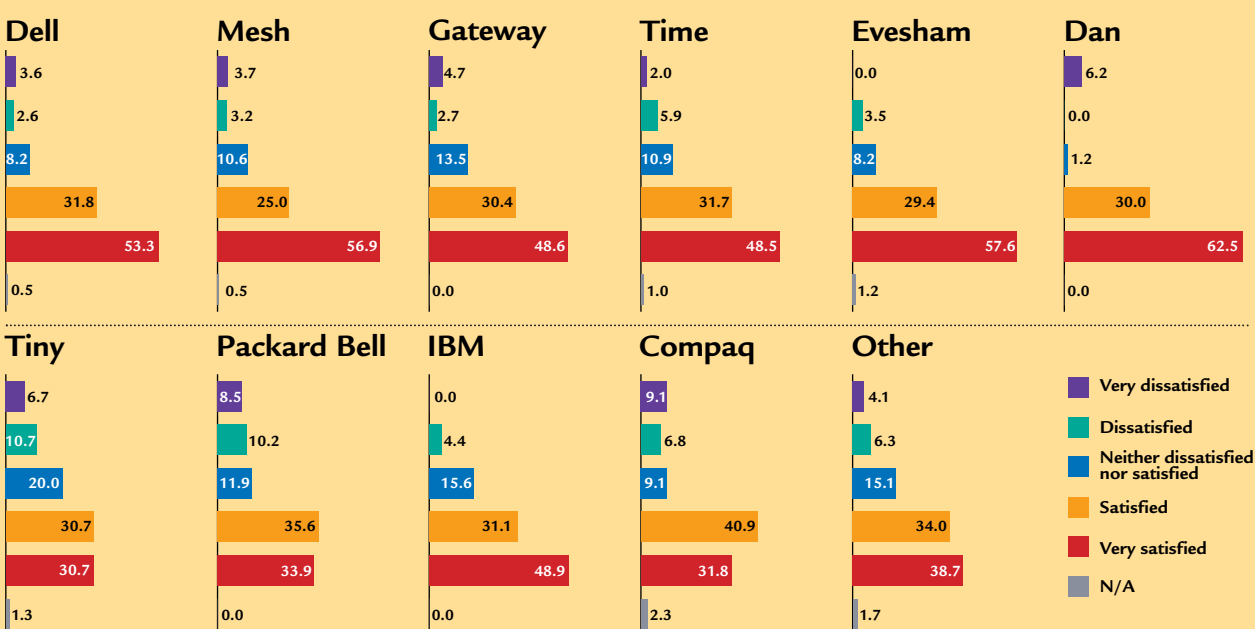
That said, companies which might be expected to have a big support infrastructure – like IBM and Compaq – fare pretty well: companies which rely on big retail channels generally come off less well. But here there is a big variation in the quality of support staff among direct suppliers.

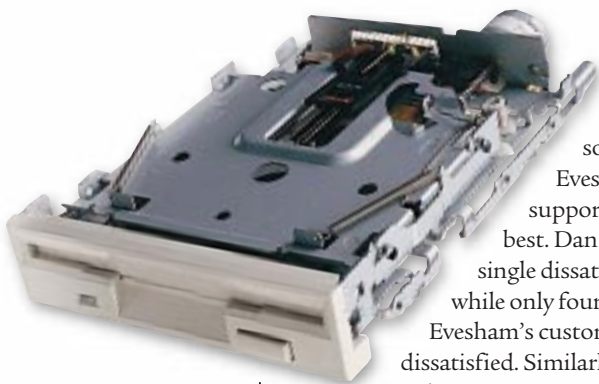
Packard Bell's support staff fared the worst, with 35 per cent of customers dissatisfied with

the manner of the company's support staff, whereas only 14 per cent of customers overall were dissatisfied. Evesham scored outstandingly well here – with a huge 59 per cent of customers very satisfied with the manner of the company's support staff, compared with an overall very satisfied rating of 22 per cent.

**Evesham's support staff** also solved problems quickly, with 45 per cent of customers very satisfied that their problems were solved efficiently, compared with an overall very satisfied figure of 17 per cent. None of Packard Bell's customers were very satisfied that their problems were solved quickly, and 56 per cent were dissatisfied with the time that it took.

## THE OVERALL RELIABILITY OF THE PC





As for providing the solution itself, Evesham and Dan's support staff fared the best. Dan didn't register a single dissatisfied customer, while only four per cent of Evesham's customers were dissatisfied. Similarly, 50 per cent of

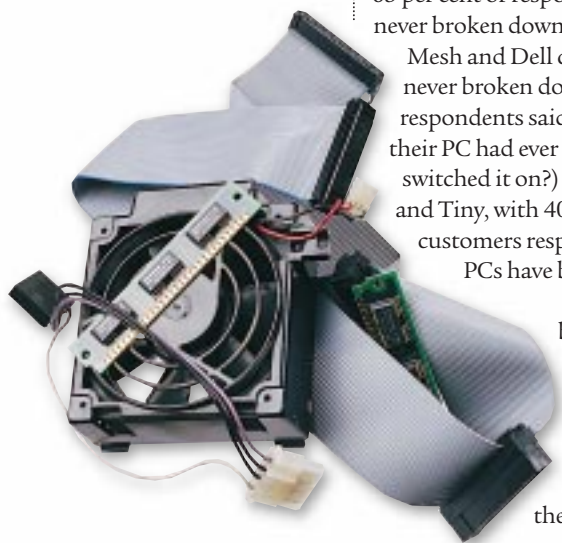
Evesham's customers were very satisfied with the solution they were given, as were 40 per cent of Dan's customers. Time also scored highly in this area.

### Breakdowns

Mesh, Dan and Dell desktops were the top scorers in our questions about reliability. Overall, 63 per cent of respondents said their PCs had never broken down, but nearly 75 per cent of

Mesh and Dell customers said their PC had never broken down. (Bizarrely, six respondents said they didn't know whether their PC had ever gone down. Have they ever switched it on?) Less reliable were Gateway and Tiny, with 40 per cent and 43 per cent of customers respectively reporting that their PCs have broken down.

Time PCs were held to be the most problematic, with 19 per cent of customers encountering four or more problems in the last six months, which prevented them using their machine.

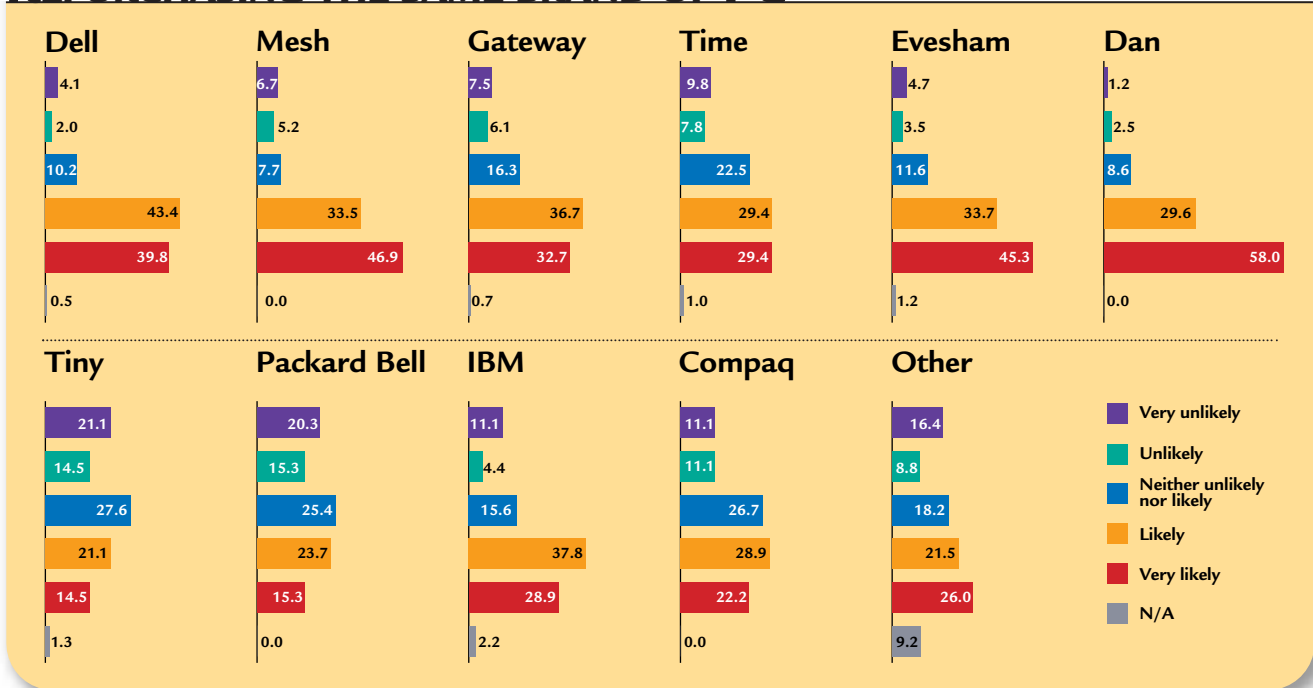


### Overall reliability of PCs

There is a great variation in terms of how satisfied customers are with the reliability of their PC, although manufacturers which supply direct score especially well. At the top end of the scale are Mesh, Evesham and Dan, with 57 per cent, 58 per cent, and 62 per cent of customers respectively, saying they were very satisfied with the reliability of their PC (see graphs on page 122).

At the other end of the scale, only 31 per cent of Tiny's customers, and only 34 per cent of Packard Bell's customers said they were very satisfied with the reliability of their PC. However, this reflected the overall figure, as only 44 per cent of respondents - less than half of all buyers - claimed to be very satisfied with the reliability of their machine. The least disgruntled customers were buyers of Mesh, Evesham and Dan PCs, and the most disgruntled were buyers of Packard Bell and Tiny PCs.

## REPURCHASING THE SAME BRAND OF PC



### Overall winners

Mesh is our overall winner this year for reliability, edging just ahead of last year's winner, Dan Technology, and runner-up, Dell. It is a notable achievement for a company that scored above average last year, but was not within the top five.

There are one or two themes that emerge clearly from this research. It's noticeable, for instance, that the top scorers are generally companies which sell direct, and companies that sell through a retail channel or resellers score less well. This is reflected in all areas of our survey – in our respondents' opinions about the sales staff they dealt with and the quality of the pre-sale advice they received, the sort of post-sale support they had when they ran into trouble and their opinions of the reliability of their PCs.

**As our results show**, it is well worth manufacturers putting in the effort to train their sales and support staff. Even when customers run into trouble, they will still feel good about a company and buy from it again if they feel their problem has been dealt with in a helpful, knowledgeable and efficient way.

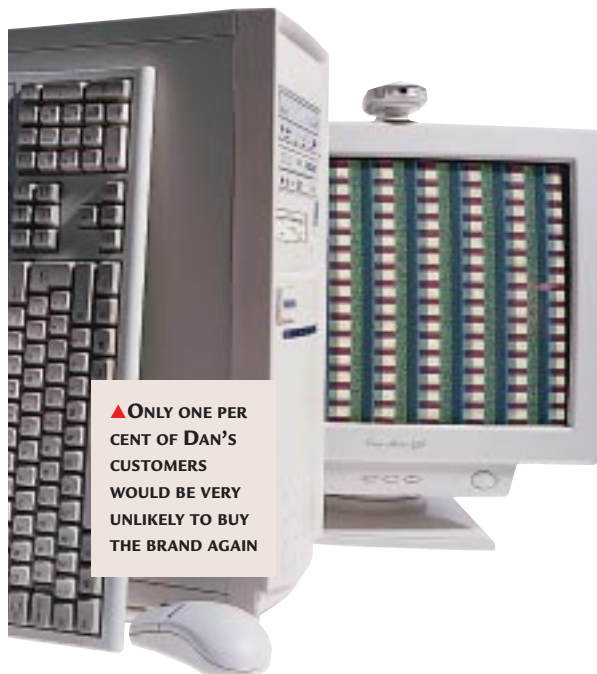
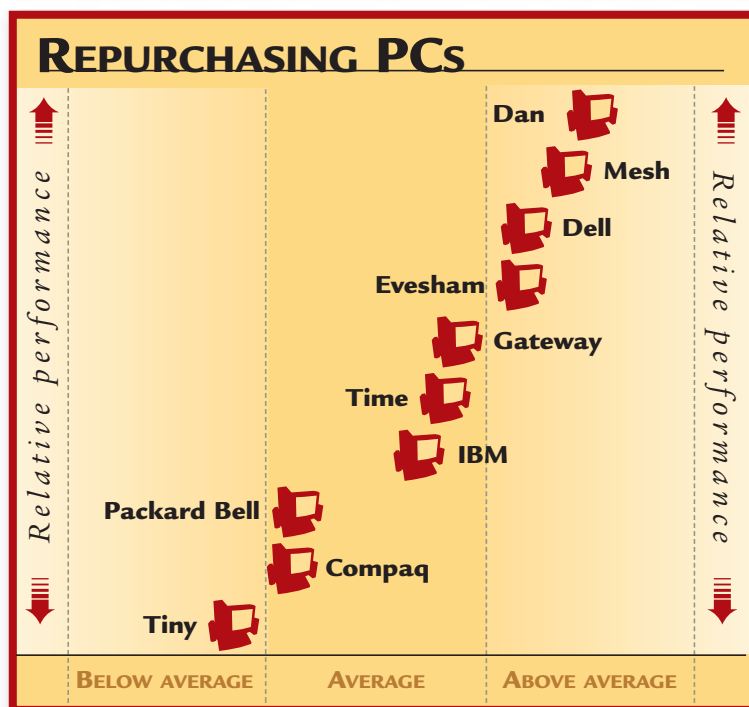
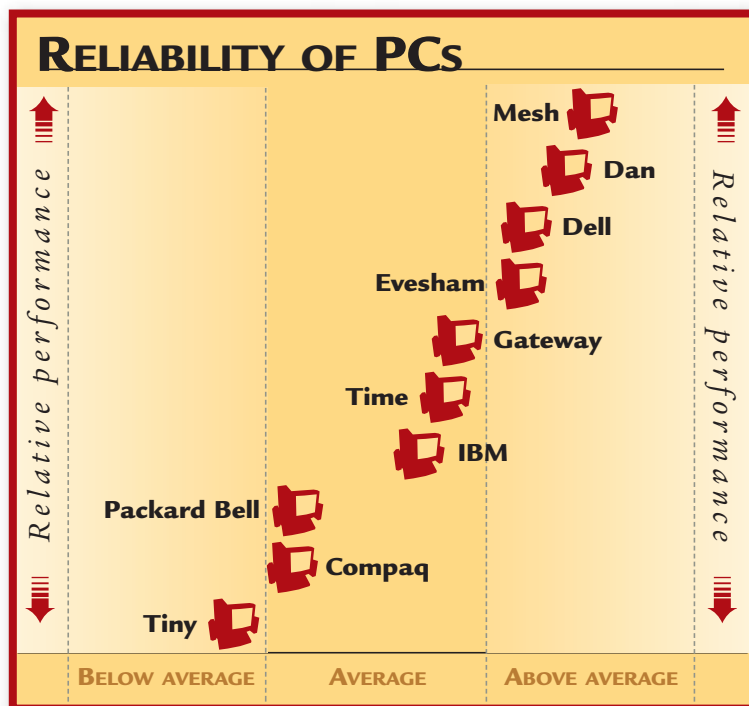
### Repurchasing

We asked respondents how likely they would be to purchase the same brand of PC again in the future. The key replies here are those at the very top and very bottom ends of the spectrum, those respondents who said they were very likely to buy the same brand again, and those who said they were very unlikely to buy the same brand again.

As shown by the graphs (*see opposite*), Dan, Mesh, Evesham and Dell customers were the most likely to repurchase. Fifty-eight per cent of Dan customers said they were very likely to buy the same brand again, compared with 47 per cent

of Mesh customers, 45 per cent of Evesham customers and 40 per cent of Dell customers. Only 15 per cent of Tiny's customers and 15 per cent of Packard Bell's customers said they would be very likely to repurchase the same brand.

**Only one per cent** of Dan's customers said they would be very unlikely to buy the same brand again, compared with four per cent for Dell, five per cent for Evesham and seven per cent for Mesh. Twenty-one per cent of Tiny buyers and 20 per cent of Packard Bell buyers said they would be very unlikely to buy the same PC again.



▲ ONLY ONE PER CENT OF DAN'S CUSTOMERS WOULD BE VERY UNLIKELY TO BUY THE BRAND AGAIN

## Section two: Notebooks

Toshiba continues to dominate the notebook market, and by far the majority of our respondents had bought Toshiba machines. It also remains the brand that all notebook manufacturers strive to compare themselves to, and this year – as in 1998 – Toshiba scored the highest in terms of reliability and likelihood to repurchase among the notebook suppliers.

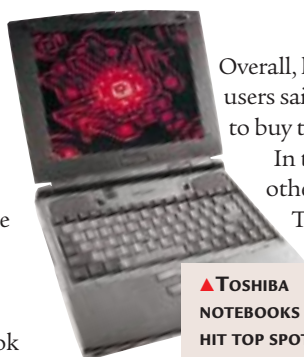
Fifty-four per cent of our respondents bought their notebook PC through mail order or direct from the manufacturer, and 21 per cent bought from a superstore or high-street retailer. Only four per cent bought through email or the web. Perhaps unsurprisingly, a greater proportion of notebook buyers bought their machine for business and office use compared with desktop buyers (91 per cent compared with 75 per cent of desktop buyers). An even greater proportion said that they would be the sole user of the machine (70 per cent compared with 38 per cent of desktop buyers).

Compaq, which sells primarily through resellers and retailers, fared the worst in terms of our readers' opinions of the pre-sale advice they received. The Compaq channel had the greatest proportion of readers dissatisfied with the helpfulness of sales staff, and the quality of advice received.

Just over 80 per cent of IBM users said their PCs had never broken down, compared with just over 70 per cent of Toshiba users and two-thirds of Dell and Compaq notebook users. The most common problem across all brands was that the PC froze or hung for a long time (in 26 per cent of cases), followed by the failure of a hard drive component and battery or power supply failure (each accounting for 23 per cent of the problems). Failure to boot up was also reported in 22 per cent of cases, and a problem with the display in 15 per cent of cases. Problems with cracked casings were also reported.

Notebook users are fairly satisfied with the reliability of their PCs, with nearly three-quarters either satisfied or very satisfied with their machine's reliability, and IBM and Toshiba customers being the most satisfied. Only 12 per cent of our survey said they were dissatisfied or very dissatisfied with reliability, with no single manufacturer scoring especially badly.

Toshiba and IBM were at the top of the pile when it came to repurchasing the same brand, with 46 per cent of Toshiba customers and 43 per cent of IBM customers saying they were very likely to buy their respective brands again.

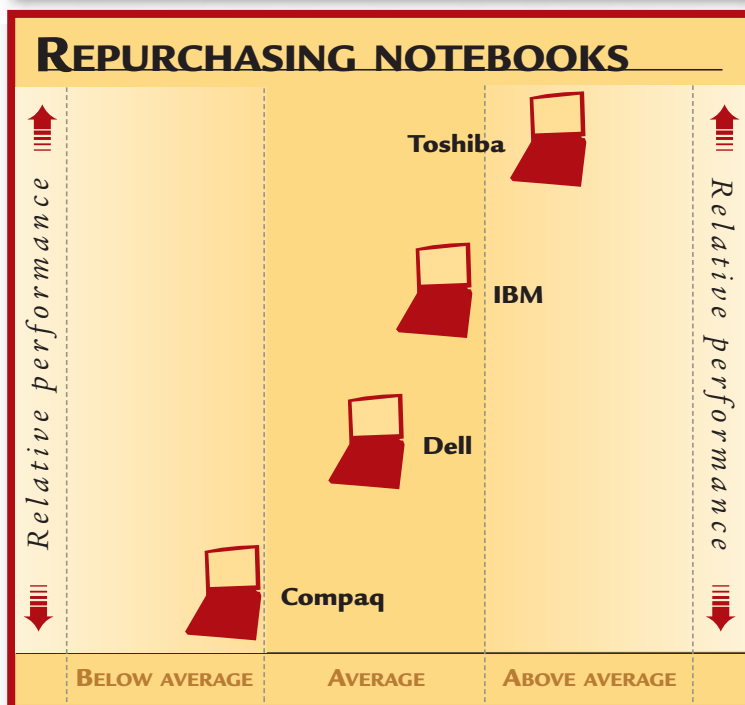
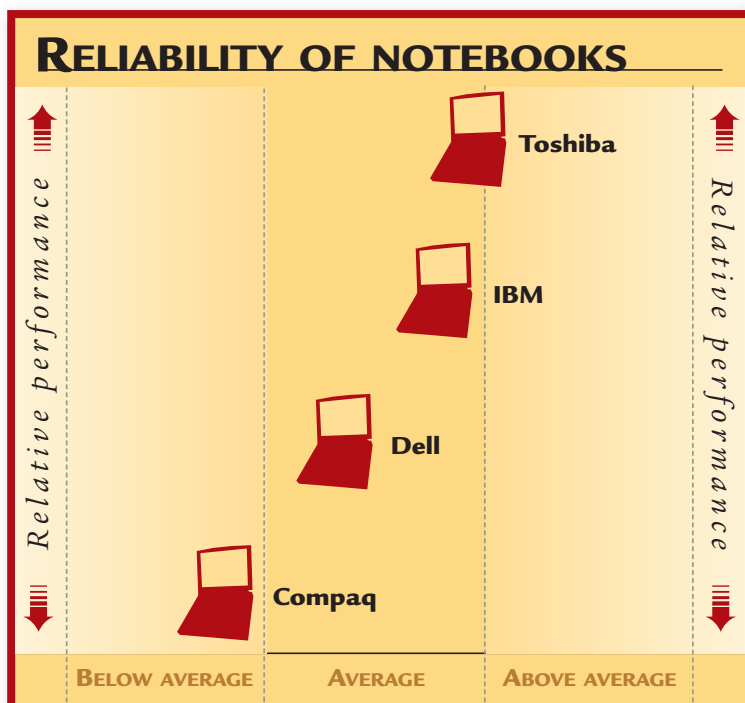


Overall, less than 20 per cent of notebook users said they were unlikely or very unlikely to buy the same brand again.

In terms of recommending the brand to others, an impressive 47 per cent of Toshiba buyers said they would be very likely to recommend the company. Toshiba's closest rival here was IBM, with 39 per cent saying they would be very likely to recommend the

brand. Overall, 33 per cent of notebook buyers would be likely to recommend their brand.

▲ **TOSHIBA**  
**NOTEBOOKS**  
**HIT TOP SPOT**





### Section three: **Handhelds**

The best-selling Psion Series 3 was the overall winner for handheld systems. However, this was a closely contested category, in which no one product received outstandingly good or bad results.

The majority (56 per cent) of handhelds were bought from a high-street retailer or superstore, and only



▲ **PSION'S SERIES 3 WAS THE OVERALL WINNER**

29 per cent were purchased by mail order, reflecting the commodity nature of PDAs. Most of our respondents (71 per cent) regularly connect their handhelds to a PC for back-up, diary synchronisation, and file exchange, though relatively few users (13 per cent) connect their handheld to a PC for email or web access.

Pre-sales advice satisfaction levels were lower for handhelds than for desktops and notebooks, in a reflection

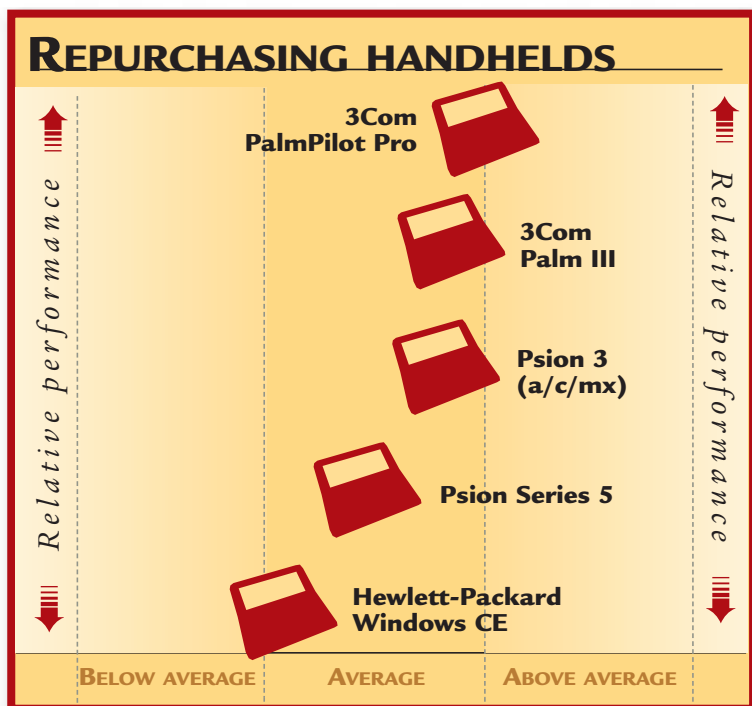
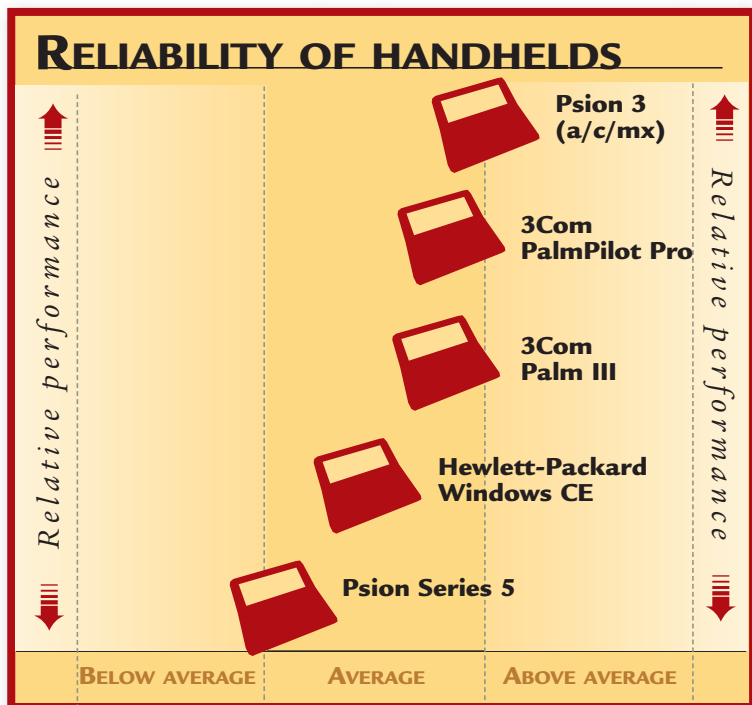
perhaps of the non-specialist retailers where many of these handhelds were bought. Overall, 40 per cent of handheld buyers said they were either satisfied or very satisfied with sales staff helpfulness, and only 12 per cent were either dissatisfied or very dissatisfied. A third were happy that the sales staff understood their needs, and a third were either satisfied or very satisfied with the quality of the pre-sales advice.

Screen display problems are the most commonly occurring problem for handheld users. The second most common problem is with the casing, followed by battery problems. Other problem areas include keyboards and data storage devices, such as removable flash cards.

No one manufacturer stood out as providing better or worse post sales support than its competitors.

Users of handhelds are generally pretty happy with their purchases in terms of reliability and are generally happy enough to want to repurchase the same brand in the future. Only five per cent were very dissatisfied, while 58 per cent overall said they were very satisfied with the reliability of their computer. Sixty-four per cent of Psion Series 3 customers were very satisfied, compared with 65 per cent of 3Com Palm III users and 50 per cent of Psion Series 5 users. The 3Com PalmPilot Pro came out top here, followed by the 3Com Palm III, and then the Psion Series 3. Hewlett-Packard users were the least likely to repurchase the same handheld brand in the future - with 11 per cent saying this was extremely unlikely. But none of the brands fared significantly badly, and all fell within the parameters that might be expected from our fictitious average brand.

Again, all the brands mentioned by our respondents fared reasonably well, with none of them falling outside the parameters that would be expected. The 3Com PalmPilot Pro came out top for recommendations, with 64 per cent of users saying they would be very likely to recommend it to a friend or colleague. It was followed by the 3Com Palm III, Psion Series 3, and then the Psion Series 5. Only 38 per cent of Hewlett-Packard Windows CE users said they would be very likely to recommend it.





### Section four: Printers

In a close-run race, Hewlett-Packard lost the top spot this year in overall reliability to Epson for a number of reasons. Epson customers were marginally more satisfied about orders arriving on time and being complete and correct. Three quarters of Epson users said they were very satisfied that everything was in working order when they received it, compared with 72 per cent of Hewlett-Packard customers. Epson's customers also tended to be more satisfied with

the support they received.

Inkjet and bubblejet printers dominated our survey, with 82 per cent of respondents saying they had bought one. By contrast, 15 per cent had bought a laser or LED printer and only one per cent had bought a



**HP IS STILL HIGHLY RECOMMENDED, DESPITE LOSING THE TOP SPOT FOR RELIABILITY**

multifunction device, which combines printer, fax and photocopier. Most printers were bought from the high street or superstore (52 per cent), with 35 per cent purchased through mail order services or direct from the manufacturer.

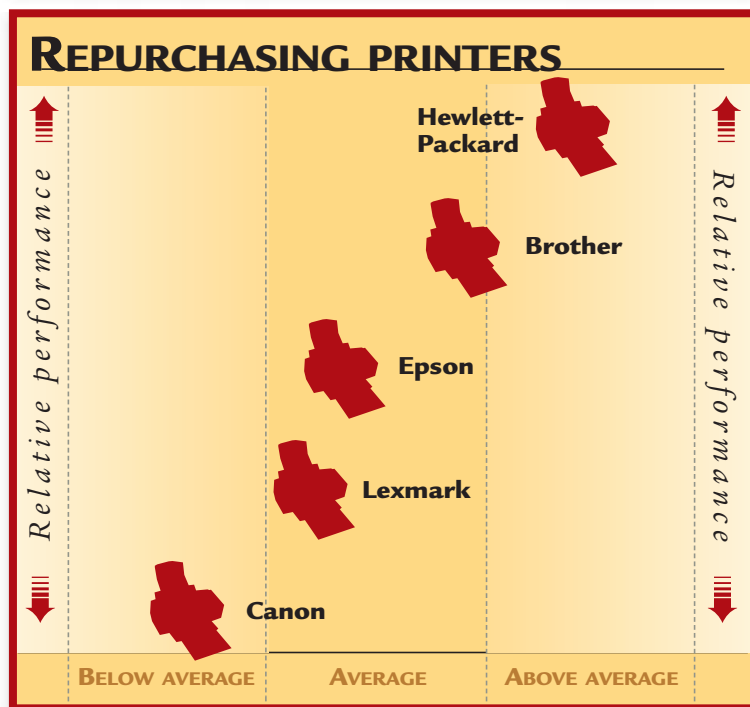
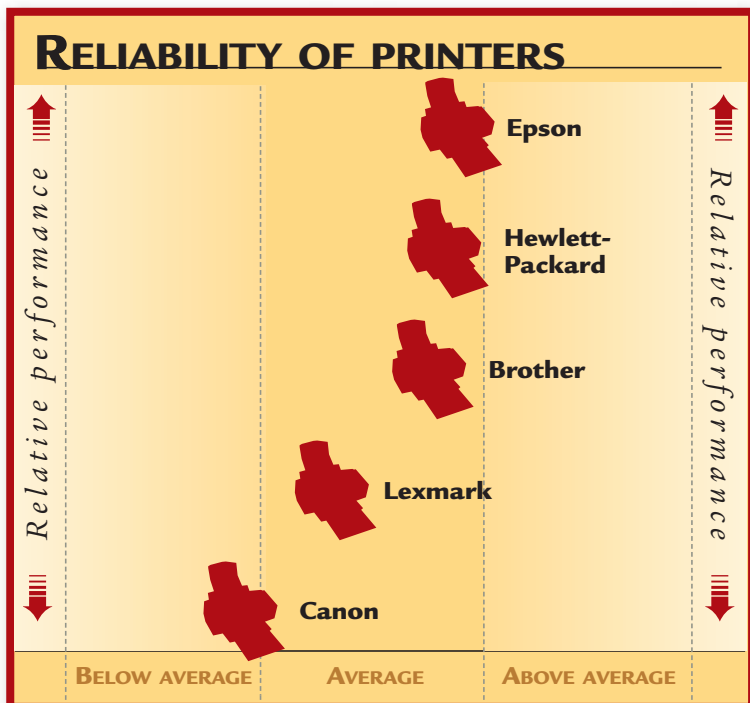
A surprisingly high 85 per cent overall said that their printer had never broken down, with Epson and Canon performing just better than the rest. The most common problem areas were paper jams and mis-feeds, followed by the print head or cartridge and toner or ink problems.

There were no huge differences in the satisfaction and dissatisfaction ratings for overall reliability between our printer brands. Fifty-four per cent of total respondents were very satisfied with the overall reliability of their printer, with Epson scoring the highest at 57 per cent, and Canon the lowest at 44 per cent. Similarly only five per cent of total respondents overall were very dissatisfied with the reliability of their printer, with no one brand standing out as performing worse than the others.

Hewlett-Packard customers are the most likely to repurchase the same brand in the future, and 54 per cent of them said they were very likely to buy HP again. Brother came in at second place, followed by Epson and Lexmark. Only Canon performed below the expectations of our average brand, with just 24 per cent of customers saying they would be very likely to repurchase the brand in the future.

Canon UK's marketing manager for bubble jet printers, Trevor Dodsworth, said the company was surprised by, and concerned about, the results of the survey. 'We welcome feedback to show us where we need to improve our performance,' he said. 'And we fully intend to act on this information to ensure enhanced customer satisfaction in future.'

Only Hewlett-Packard outperformed the expectations of an average brand when it came to recommending the brand to colleagues or friends. Fifty-seven per cent of respondents said they were very likely to recommend HP, compared with only 28 per cent of Canon customers, the worst performing brand in this category.





# The colour of money

THE RIGHT COLOUR-PRINTING TECHNOLOGY FOR THE WORKPLACE IS NOT ONLY BECOMING MORE AFFORDABLE, BUT ALSO MORE DESIRABLE. ROGER GANN REPORTS.



Illustration by Joe Presedo

While laser-quality monochrome output is still the standard in business, colour printing isn't far behind. Rather

than sending jobs out to print or copy shops, users are beginning to demand in-house colour printing capabilities. Luckily, colour printing has never been more affordable. Early colour lasers cost £7,000, but today prices start at less than £1,000 and their output is much improved.

The same is true in all areas of the colour printer market. Today, you can pick up an inkjet printer for £100 (ex VAT) or less that can produce good photo-realistic images. But for an office environment, cheap inkjets can not offer the speed or duty cycles necessary.

## Printer technology

All modern colour printers do essentially the same thing: they take cyan, magenta, yellow and black (CMYK – the K stands for keyline) inks and 'dither' them to produce the optical illusion of other colours. Dithering increases the graininess of an image, but sticking with solids produces banding, posterising and other artefacts. However, the four printers in this round-up use very different technologies to place colour on the page.

**Colour laser printers** use the same electro-photographic print technology as monochrome models. However, CMYK printing requires far more complicated print engines.

The four-colour image is split into separate components. The cyan image is painted onto a charged photo-conductor drum by a pulsing laser, which sweeps the drum. Points on the photo-conductive drum surface lose their charge when hit by the laser. The drum passes over the cyan toner cartridge, where toner particles are attracted to the charged points on its surface. Excess toner is discarded into a waste toner bottle. The drum then rolls against an image-transfer belt, which moves the cyan toner image to the belt. This process is repeated for the other three colours, each time adding a properly-aligned one-colour image to the belt. After the fourth pass, the belt contains a complete image. A sheet of paper is passed over a charged image-transfer roller, which moves the toner image from the belt to the paper.

A pair of heated fuser rollers are painted with oil by a coating roller. The paper passes through the rollers, where the toner melts and mixes with the fuser oil, which helps permanently fuse the image to the page. Residual toner is scraped from the transfer belt into a waste receptacle. This four-stage process accounts for the slow print speeds of colour laser printers – it can be one

## The printers in action

### HEWLETT-PACKARD DESKJET 970CXI

The DeskJet 970CXi has an add-on duplexing option as standard – a first for an HP inkjet printer at this price. Paper handling is above average too – the removable paper tray has a capacity of 150 sheets. The printer has no built-in networking capability, though a JetDirect add-on is an optional extra. The printer comes with both parallel and USB interfaces as standard. Installation is simple using USB. Calibration is a cinch as well – the printer has an optical sensor and can calibrate itself.



The colour-printing capabilities are impressive, perhaps the best we've seen thus far from an inkjet printer. Its ability to deliver solid colour, without any trace of banding at all, is remarkable. Text output is equally good – even the draft/economy mode was very acceptable. Print speeds were also good for an inkjet printer, especially on the Word document, although they slowed on the spreadsheet. (For a full review of the HP DeskJet 970CXi see p95)

**Price** £279 (£237.45 ex VAT)

**Contact** Hewlett-Packard 0990 474 747

[www.hp.com/uk](http://www.hp.com/uk)

### QMSCOLORSCRIPT 330

**QMS now ships** two dye-sub printers, the ColorScript 310 and 330. We looked at the latter, which as an A3 printer is a large machine. It's a Pantone-certified pure PostScript device, with 128MB RAM and parallel, serial, LocalTalk, and SCSI ports, plus a 10Base-T network interface. The ColorScript 330 may seem a bit of a dinosaur with its 300 x 300dpi resolution, but this isn't an issue with dye-sub because the dots merge in continuous tones.



The ColorScript 330 predictably delivered gorgeous A3 colour proofs, on paper that closely resembled glossy photographic paper in look and feel. Grain was hard to discern, even with the aid of a magnifying glass. Curiously, some banding artefacts are visible in the normal-sized colour print, possibly due to screen-angle effects, which completely disappear when the same image is blown up to fill the A3 page. On the CorelDraw image, the default printer settings delivered solid colours that were a touch too light, compared to the other printers we looked at. It's no speed demon either – depending on the complexity of the image, you can wait up to 12 minutes for a print.

There is another catch – you consume the same amount of dye film whether you print a poster or a postage stamp.

**Price** £4,112.50 (£3,500 ex VAT)

**Contact** QMS 01784 445 555

[www.qms.nl](http://www.qms.nl)

## Choosing the right printer

When choosing a printer, first look at the types of documents you want to print and in what quantity. Knowing the type of output you want is vital in choosing print quality as well. If you just want some colour to liven up the monthly reports and letterheads, then pretty much any colour printer will do. If your print volume is high, you'll want to put print speed at the top of the list, while those with lower-level demands may opt for a higher resolution or a less expensive unit. Next, decide what role colour plays in your output. Finally, consider combining a couple of affordable printing solutions (a monochrome laser and a colour inkjet, for example) to meet your needs.

Of the four colour printing technologies available, laser or solid ink technology is probably the best choice for networked colour printing. Both types of page printer typically have high duty cycles, provide good performance for colour printing, have excellent paper handling and are easy to network. Laser printers print in monochrome at two-to-three times the speed of colour and are generally faster than any of the other technologies. The main

drawbacks are the number of user-replaceable components and the high initial cost.

Solid ink printers produce vivid colour – particularly on transparencies – and are gaining ground. However, they are still aimed at the graphic arts market.

Liquid inkjet printers are still most commonly used as personal colour printers. They are cheap and produce excellent output, particularly on special paper or transparencies. However, their sluggish performance and low duty cycles make them unsuitable for a multi-user environment. They also lack the range of interfaces, remote-administrative and buffering tools necessary to operate efficiently in a networked environment. They have modest duty cycles, but low-capacity ink cartridges and paper input trays need frequent replenishing. As a result, per-page printing costs are higher.

Dye sublimation printers are capable of delivering results that are virtually indistinguishable from high-quality colour photographs. This comes at a price, with both high acquisition and running costs, so these printers are not usually found in a typical office.

quarter of its mono page rate. The 12ppm (pages per minute) Lexmark Optra 1200, however, uses a slightly different process. An array of four LED heads enable the four toners to be applied in a single pass, making it one of the fastest colour page printers on the market.

**Inkjet printers** work in a completely different way. A fine jet of ink is sprayed on to the paper by a head that moves from side to side on a carriage as the paper passes. The most common method for controlling the ink flow is to heat the ink, creating a bubble that squirts out a small jet of ink when it bursts. Epson inkjets employ a piezo-electric device. This is a small piece of material that changes shape under electric current, opening and closing the jet with a precision that would otherwise be impossible. Because of the moving-head approach, inkjet printers are significantly slower than lasers. To work at high resolution, inkjets also require expensive treated paper to stop the ink diffusing. However, inkjets can handle a much wider range of materials than laser printers, printing as easily on card or fabric as on paper, because an inkjet does not require the media to run around a drum.

**Solid ink printing** is a bit of a misnomer. The printers don't use ink, except in a generic sense, and the ink isn't solid when they print. It goes in as a solid block of wax, but the printer melts it before it starts printing, then sprays it through nozzles like an inkjet printer. Unlike other printers, which apply ink directly to the paper, the revolutionary Tektronix Phaser 340 borrowed from the world of offset printing, by first spraying the wax on a drum, then transferring it

## Network printing

Network printing is relatively straightforward under most operating systems. Just as you can share disk drives, so printers can be just another shared network resource, making it easy for one printer to service a number of users. Under Windows 9x, providing that the File and Printer Sharing network service is installed, all you need to do is right click the printer icon to make a printer shared. You then install the printer driver software on another workstation on the network, (installing it as a network rather than a local printer) and browse to locate it on the network. Now, whenever that workstation prints, the job is sent over to the host workstation where it is spooled

and printed out in due course. It can therefore be both cheap and easy to network a printer. However, the host PC must be running for other workstations to be able to send jobs to the shared printer and a very busy printer can slow down the host PC.

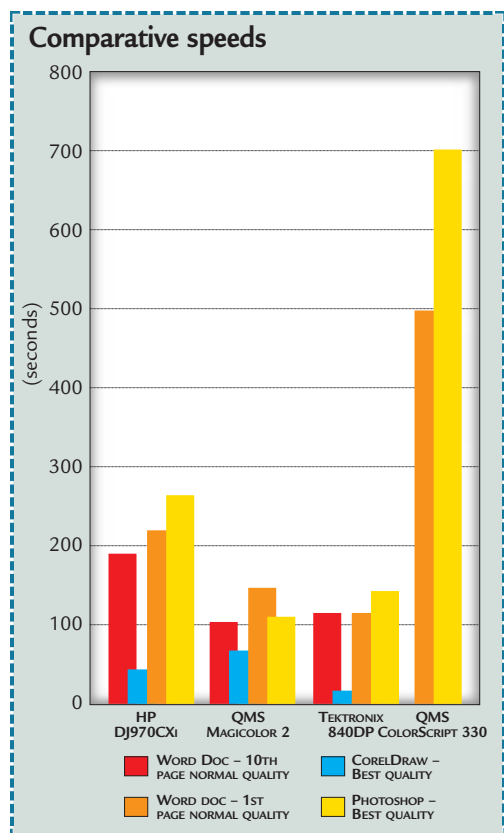
A superior way of networking is to install a network card in the printer (assuming it has a suitable expansion slot). This lets you site the printer anywhere on the network and makes the printer independent of any particular PC. But network cards for printers tend to be exorbitantly priced (10 times the price of a PC NIC is not uncommon) and they can be trickier to set up, especially if you're unfamiliar with the TCP/IP or IPX

network protocols. For printers that lack I/O slots, you can get print-server boxes from about £100 (ex VAT), which perform much the same task.

As well as sharing, other benefits accrue from networking printers. Many high-end printers now feature a built-in web server, allowing users to inspect and configure a printer remotely, just using their web browser. As well as being able to issue warnings such as 'toner low' to users over the network, printers are increasingly featuring job-accounting facilities. These allow departmental or individual use to be tracked, to permit accurate back-charging of printing costs incurred – which is essential where costly colour printing is concerned.

to paper. This new design speeds up printing enough to make the Phaser 340 (and its successor, the 840) appropriate for mono as well as colour. It also solves a problem that the technology has with transparencies. Drops of liquid wax sprayed on a transparency dry in a semi-spherical shape, creating a lens effect, making it a poor choice for transparencies. The new design eliminates the problem by flattening the wax drops when they move from the drum to the transparency.

**Dye sublimation** uses four sheets of film for the ink colours. The ink is heated, transforming it from solid to gas, a vaporisation process known as sublimation. By heating it to different degrees, different quantities of ink are laid on the paper. The gaseous dye hits the paper in various levels of dye intensity. For example, a single dot may consist of 10 per cent cyan, 30 per cent magenta, and 25 per cent yellow dye, a trick the inkjet printer can't do. A dye sublimation printer makes a pass across the paper for each colour. This makes the process slow, and requires precise placement to ensure that the colours are perfectly aligned, but enables high resolution and a more solid colour appearance. This is the only technology available today that offers true photographic-quality output. You won't see dithering patterns, because thermal dye printers don't dither, they print with true continuous tones. On the downside, resolution seems stuck at 300dpi, which means text output is fairly poor.



## QMS MAGICOLOR 2

**Currently the cheapest** colour laser printer on the market, the basic but good Magicolor 2 DeskLaser delivers a lot of bang for your buck. It's based on a Hitachi print engine that can deliver 600 x 600dpi resolution. More importantly, this entry-level colour laser printer comes with a 10Base-T 10Mbit/sec network interface as standard. Running costs are not the lowest on the market – the 10,000-page black toner cartridge costs £110, while the 6,000-page colour toner cartridge costs £90 a pop. Still, they're easy enough to install.



The Magicolor 2 offers good output quality for business documents. Both graphics and text were suitably crisp; grey-scale and colour fills were solid and even; graphics offered bright, fully saturated colours; gradients in both graphics and photos changed gradually, with the merest hint of banding. One caveat: the driver software didn't detect the type of print job correctly, so when left on Auto, text print speeds were poor. Once set to mono, it delivered 15ppm. It was, however, pretty slow on the spreadsheet test, regardless. Print speeds also fluctuated between runs.

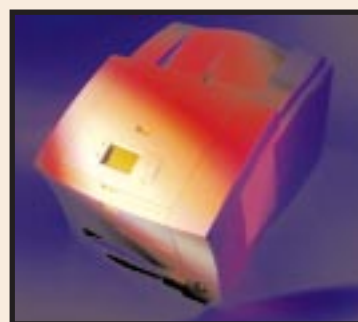
**Price** £1,173.83 (£999 ex VAT)

**Contact** QMS 01784 445 555

[www.qms.nl](http://www.qms.nl)

## TEKTRONIX PHASER 840DP

**The Phaser 840** supersedes the 360 and offers all-round improvements: 10ppm vs 6ppm, 1,200 x 600dpi vs 600 x 400dpi and 64MB RAM vs 32MB RAM. The 840N is available for about £1,975 (ex VAT), while the full-duplexing 840DP costs £2,800 (ex VAT). As with its predecessor, black ink is free for the life of the printer. The printer is easy to network, using either IPX or TCP/IP and can be administered via a web browser. It's also easy to set up and maintain, using solid 'Colorstix' that drop into keyed receptacles under a top cover. A useful feature is its six-line LCD panel, which shows what the printer is doing and options available.



Its print quality is well suited for business users, with nicely saturated colours. Low-resolution output on plain paper was excellent for charts and graphs and passable for photographs and continuous-tone images. Note that the high-resolution/photographic mode requires extra memory and is available only on the Plus and Extended.

Output quality and speed depends on the mode being used, ranging from a simple fast colour (good for adding simple colour to printouts such as emails and memos), to a high-resolution mode, geared for photographic printouts. Output in Normal mode was good, while in Best mode it was very good. Text was also sharp and indistinguishable from most mono lasers, though not quite as sharp as HP's DeskJet 970CXi.

**Price** £3,284.13 (£2,795 ex VAT)

**Contact** Tektronix 01628 403 300

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

## PHOTO SAMPLES



HP DeskJet 970CXi



QMS ColorScript 330



QMS Magicolor 2



Tektronix Phaser 840DP



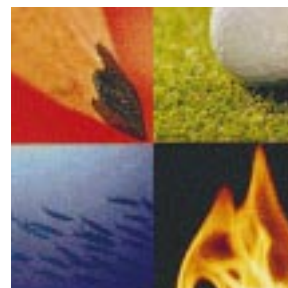
HP DeskJet 970CXi



QMS ColorScript 330

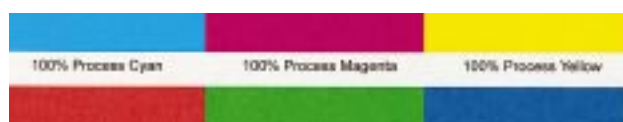


QMS Magicolor 2



Tektronix Phaser 840DP

## CORELDRAW SAMPLES



HP DeskJet 970CXi



QMS Magicolor 2



QMS ColorScript 330



Tektronix Phaser 840DP

## TEXT SAMPLES

HP DeskJet 970CXi

We will be testing you with files from four popular applications. The first is this letter, indicating text quality, and doubling up as a test for average engine speed. Secondly we will use Excel to format a large spreadsheet onto a single A4

QMS Magicolor 2

We will be testing you with files from four popular applications. The first is this letter, indicating text quality, and doubling up as a test for average engine speed. Secondly we will use Excel to format a large spreadsheet onto a single A4 page - an

Tektronix Phaser 840DP

We will be testing you with files from four popular applications. The first is this letter, indicating text quality, and doubling up as a test for average engine speed. Secondly we will use Excel to format a large spreadsheet onto a single A4 page - an

ULTIMATE HOME PCs >>  
*group test*





# Home sweet home

Putting together the **ultimate home system** can be difficult, so we threw down the gauntlet to 13 manufacturers to do it for us.

There's more to PCs than crunching numbers and writing letters – there's the really serious stuff like playing Quake and watching DVD movies. The home PC has to take on many roles – an office away from work, the kids' gaming centre or a lifeline to Auntie Maude in Australia. To put together the ultimate home and entertainment system is no easy task, so we invited 13 manufacturers to do the hard work for us.

As the system had to be a good all-rounder, suitable for office applications, playing games, watching DVDs, and so on, we were fairly flexible on the specification. We allowed for any processor with a minimum of 128MB of RAM. The hard drive had to be at least 8.4GB in size, while the display set had to consist of a minimum 16MB graphics card coupled with a monitor of no less than 17in. The following essential items also had to appear in the package: sound card and speakers, DVD-ROM, MPEG2 decoder (hardware or software) and a modem. The software bundle was up to the supplier, and the machine had to come in at under £1,200 excluding VAT.

So if you're after an all-encompassing home PC, check out what 13 of the top vendors have to offer.

## Ratings

- ★★★★★ **Highly recommended**
- ★★★★ **Great buy**
- ★★★ **Good buy**
- ★★ **Shop around**
- ★ **Not recommended**

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• PCs tested and reviewed by Will Head and Riyadh Emeran

## Big Red Computers REDi/R500

The first thing that strikes you about this system is the case, but when it comes down to it, it's really just a beige box in translucent red clothing. More importantly, inside is a Pentium III 550 coupled with 128MB of RAM. This configuration helped Big Red score the best SYSmark result for an Intel-based system, although it was still pipped at the post by the AMD Athlon-equipped machines.

Quantum manufactures the 13GB hard drive, but no provision has been made for removable storage.



Multimedia takes the form of a Pioneer slot-loading DVD-ROM drive, a Creative Labs Sound Blaster Live! Value and Big Red's own speaker system. Internet access is via a Diamond SupraExpress V90 internal modem. The graphics come from a 3dfx Voodoo3 3000 and a Viewsonic 17in monitor. This setup can easily handle DVD playback and all the latest games. If anything has been sacrificed to put this machine together for the money, it is the monitor - which performs adequately, but does not excel.

Build quality was good with easy access to the inside, where there is space left for one 3.5in and two 5.25in devices.

One downside of the REDi/R500's case is that the only available external 3.5in bay houses a non-standard floppy drive with a custom fascia. Addressing the lack of removable storage with an internal Zip or Jaz drive would involve mounting it inside a 5.25in bay, which looks untidy.

One note about the Big Red system: the first unit arrived with a faulty floppy drive and the CPU in the replacement machine was clocked at 366MHz. Only once these problems had been corrected could the REDi/R500 be seen performing at its best.

### PCW DETAILS

**Price** £1,408.82 (£1,199 ex VAT)

**Contact** Big Red Computers  
08700 711117

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

**Good points** Fast processor, good graphics card

**Bad points** Poor monitor, no removable storage

**Conclusion** Decent Intel system marred by poor quality control

<b>Build Quality</b>	★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★

## Dan Technology Dantum CEL500/PS

Dan was the only contender to submit a Celeron processor, running at 500MHz, opting instead to spend the money on extra peripherals.

There really isn't much missing from this system, it just doesn't excel in any particular area. The 500MHz Celeron and 128MB of RAM, occupying one of the three available DIMM slots, provide enough power to play the most recent games and watch DVD movies. For storage, the

18GB Western Digital hard drive is a generous



provision, which should take some time to fill. Removable storage comes in the form of an LS-120 drive. The capacity may not be huge, but it's still good enough for safeguarding important files.

A Creative Labs six-speed DVD-ROM drive occupies the bottom 5.25in bay, leaving two empty bays above for future expansion, with a free 3.5in bay further down. The 16MB ATI All-In-Wonder provides a software MPEG2 decoder with hardware motion compensation. It also includes a TV control panel for the built-in tuner which provided good results when combined with the 17in CTX monitor.

**Sound came from** the popular Creative Labs Sound Blaster Live! Value and Creative PC Works 4.1 Surround speakers.

A Dan-badged V90 Rockwell modem provides Internet connection. Also included in the package is an Epson Stylus 740 printer and an HP Scanjet 4100 scanner, leaving you wanting for absolutely nothing.

In terms of build quality, Dan has chosen to supply cables that are just the right length to neatly fulfil their purpose. The Dan may not be the fastest machine on test, but if you're looking for a total solution for your home computing needs it should be top of your list.

### PCW DETAILS

**Price** £1,410 (£1,200 ex VAT)

**Contact** Dan Technology  
0181 830 1100

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

**Good points** Excellent package (printer, scanner, LS-120 drive)

**Bad points** Poor processor.

**Conclusion** A good all-round performer, but not the fastest machine on test

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★



## Dell Dimension XPS 75

**Dell supplied a well-specified machine** for this test. The core is a 500MHz Pentium III, coupled with 128MB of RAM. Storage takes the form of a large 20GB Maxtor hard drive, with an internal Iomega Zip 250 to cater for data backup and transport and a six-speed DVD-ROM drive from Toshiba.

The display set takes the form of a formidable 32MB Diamond Viper V770 AGP card that's connected to a 19in Philips Mago monitor.

An Aztech V90 modem provides

Internet connection, and also includes voice capabilities.

Dell has opted for the Creative Labs Sound Blaster Live! Value card (that appears quite prominently in this test with good reason), combined with a set of Altec Lansing ACS 340 speakers providing a good solid sound platform.

**The Dell also has** decent upgrade possibilities. The main hard drive is mounted vertically against the front of the case, leaving extra room above for one free 5.25in bay, along with two 3.5in bays, one internal and one external.

Slots on the motherboard consist of five PCI and one ISA (which is shared). Dell's configuration leaves four of the PCI and the one shared ISA slot free. The motherboard is equipped with three DIMM slots, of which two are empty.

Inside, the case is tidy, with pull handles attached to leads that are likely to be removed.

Thoughtfully, Dell has provided a hard drive cable with a second connector on it, although it may be a while before this is put to use, due to the overall high specification of the machine. Ultimately, Dell has provided a good all-round machine that's unlikely to disappoint.

### PCW DETAILS

**Price** £1,408.82 (£1,199 ex VAT)

**Contact** Dell. 0870 152 4350  
[www.dell.co.uk](http://www.dell.co.uk)

**Good points** Internal Zip 250, large hard drive

**Bad points** Would have liked to have seen slightly better performance for the money

**Conclusion** A good machine, which only just missed out on an award

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★



## Elonex ProSentia 2000

**Elonex has crammed** a lot of stuff into a small case and, as a result, upgrade options are severely limited. We would have rather seen a larger case for a machine of this specification. A 128MB SDRAM module fills one of the two available DIMM sockets. There are three 3.5in bays and two 5.25in bays, but only one of each is free. The first 3.5in bay is taken up by a 13.7GB Fujitsu hard drive and the second by an LS-120 drive, which is a good choice given the limited space offered by the case. A Sony six-speed

DVD-ROM sits in the top 5.25in bay.

The Winfast 3D TNT II graphics card is based on the nVidia Riva TNT 2 chipset and is connected to a 17in Elonex-badged monitor, to good effect. Elonex has opted for an on-board Creative Labs sound chipset rather than a card. It is true that a separate card would have occupied one of the two spare PCI slots, but the result is a sub-standard sound solution.

The Pentium III 550 processor is fast and you are rarely left twiddling your thumbs, but this speed fails to make up for the other deficiencies in the machine. We would rather have seen the money spent elsewhere.

Inside the case things are very cramped, mainly down to its size, with the cabling as neat as it can be given the close

confines. The Microstar motherboard offers three PCI slots and one shared ISA slot, with an internal V90 3Com Winmodem occupying one of the PCI slots.

**The Elonex offers impressive** speed and a decent specification, but the expensive processor leaves other areas lacking and the small case lets the package down.

### PCW DETAILS

**Price** £1,404.13 (£1,195 ex VAT)

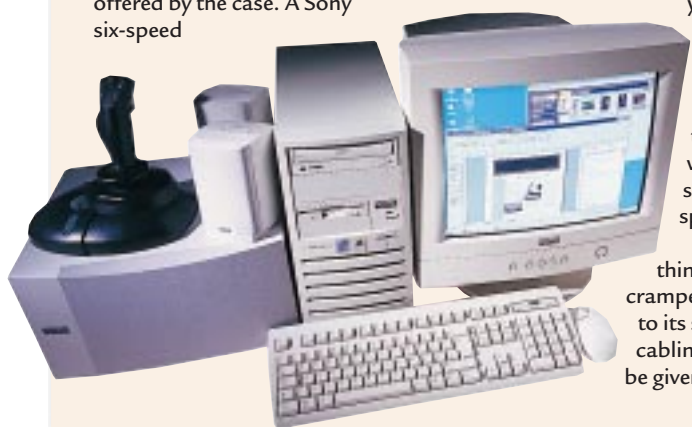
**Contact** Elonex 0800 542 2931  
[www.elonex.co.uk](http://www.elonex.co.uk)

**Good points** Fast processor, LS-120 drive

**Bad points** Tiny micro tower case

**Conclusion** Too much emphasis has been placed on the speed of this machine

<b>Build Quality</b>	★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★



## Gateway Performance 450

Gateway has provided an excellent office machine, unfortunately we did ask for a system for entertainment as well as work, and subsequently the Performance 450 isn't really up to the job. The choice of a desktop case means that upgrade options are somewhat limited. Gateway also initially supplied only 64MB of RAM, not the 128MB we specified.

However, Gateway assured

us that the production model will ship with a single 128MB SDRAM module, leaving two DIMM sockets empty for memory expansion.

The 450MHz Pentium III isn't the fastest chip on the block and, as a result, the Gateway sits fairly low down in the SYSmark table. A 13GB Western Digital hard disk takes care of internal storage, but there's no removable storage option, excluding the standard floppy drive. The DVD-ROM is a six-speed Toshiba drive and the 32MB STB Riva TNT2 card provides solid performance in both 2D and 3D applications. The 17in monitor is a decent enough unit, but we would have been happier with a 19in model considering the rest of the spec. A Creative Labs Audio PCI 64V, coupled with Boston Media Digital Theatre speakers, provides a reasonably impressive sound platform.

Only one 5.25in bay and one 3.5in bay were available for expansion. The motherboard offers five PCI slots (of which two

were free) and one shared ISA slot. The V90 modem from GVC Telepath Pro occupies the shared slot, although we felt it would have been better positioned in a dedicated PCI slot, leaving improved upgrade options. Also included with the package was an Epson 440 printer which, while a good performer, can't compare with the Epson 740 supplied by Dan.



### PCW DETAILS

**Price** £1,371.23 (£1,167 ex VAT)

**Contact** Gateway. 0800 552000  
[www.gateway.com/uk](http://www.gateway.com/uk)

**Good points** Includes printer

**Bad points** Poor performance, desktop case

**Conclusion** More suited to the office than to the home

<b>Build Quality</b>	★★
<b>Performance</b>	★
<b>Value for Money</b>	★★
<b>Overall Rating</b>	★★

## Hi-Grade Computers Ultis PV111

Hi-Grade has packed a 550MHz Pentium III with 128MB of RAM into this system. The hard drive is a 13GB Maxtor, but unfortunately there is no removable storage option (discounting the floppy drive). The Asus motherboard sports four PCI slots, but only one is empty. However, three ISA slots are all free, while two of the three DIMM sockets are also dormant.

The six-speed DVD-ROM drive from Hitachi and the Asus video card, based on the nVidia RIVA TNT 2 chipset, form a capable DVD movie platform,

especially when combined with the impressive image supplied by the LG Flatron 17in monitor. This is a super-flat CRT screen with very little reflection to spoil your viewing pleasure. Hi-Grade has chosen the Creative Labs Sound Blaster Live! Value, which pumps high-quality digital and wavetable effects to the Samsung speakers. Sadly, the speakers don't do the card justice.

Connection to the outside world comes from an Accord V90 modem. Hi-Grade has also chosen to include a Teletext TV-tuner card, a welcome addition for a home entertainment machine.

The case offers good upgrade potential, with two free 5.25in bays, one free external 3.5in bay and two free internal 3.5in bays. However, gaining access to one side of the lower-most drive bay isn't possible without removing the motherboard's mounting plate. This is almost forgivable, since access to the inside of the case can be obtained via two sliding clips, without tools.

The rear ports on the Ultis PV111 system have also been colour-coded by Hi-Grade to provide simple assembly, but the peripherals that plug into them don't share this PC 99 compatibility.

### PCW DETAILS

**Price** £1,408.82 (£1,199 ex VAT)

**Contact** Hi-Grade Computers  
0181 532 6123  
[www.higrade.com](http://www.higrade.com)

**Good points** TV tuner, Pentium III 550MHz processor

**Bad points** Speakers aren't up to the job

**Conclusion** A decent set of components coupled with a good monitor

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★



## Inetdata Viking Ecstasy

**The first thing we noticed** about the Viking Ecstasy was the 3D glasses attached to the Elsa Erazor II Revelator graphics card. The glasses promise to deliver realistic 3D effects, but unfortunately the results are rather less exciting. We feel that the user would soon tire of wearing the glasses and the effect was only really noticeable if you moved your head around a lot.

The Logitech cordless keyboard and mouse work very well, but you have to really question the need for them and their battery life is a concern. After having the

system running for a week the range of the mouse had dropped considerably. The last thing you want in the middle of using a computer is to have to hunt around for some replacement batteries for the keyboard.

The Pentium III 450MHz processor and 128MB of RAM did not yield a particularly high SYSmark score. The Pioneer six-speed DVD-ROM and Creative Labs Sound Blaster Live! Value were aided by a RealMagic Hollywood hardware MPEG2 decoder, which produced excellent movie playback.

The 19in Hansol monitor was crisp and clear, except when used in conjunction with the 3D glasses – as this caused the effective refresh rate to be halved.

The V90 modem included in the package was an OEM model based on a Rockwell chipset.

A high-quality 14.4GB IBM hard disk is large enough to keep the majority of users happy, but there's no removable storage supplied.

**Inside, the system** was very untidy

– with wires interwoven to the extent that it was difficult to see where some of them went. The overall build quality of the machine was also poor. It's a disappointing debut from Inetdata.

### PCW DETAILS

**Price** £1,408.82 (£1,199 ex VAT)

**Contact** Inetdata UK  
01372 470 777

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

**Good points** Hardware DVD decoder

**Bad points** Not well put together, too many gimmicks (3D glasses, cordless keyboard and mouse)

**Conclusion** The machine never really delivers, and the money would have been better spent on more solid components

<b>Build Quality</b>	★
<b>Performance</b>	★
<b>Value for Money</b>	★★
<b>Overall Rating</b>	★



## Mertec Computers Extreme K6-III 450

**Mertec supplied** an AMD K6-III 450 with 128MB of RAM. Storage takes the form of an IBM 16.8GB EIDE hard disk with no form of removable storage supplied. The case provides two free 5.25in bays and two free 3.5in bays. The FIC motherboard has two of the four PCI slots free, while both the ISA slots are empty. Two of the three DIMM sockets also lie dormant.

The five-speed DVD-ROM drive is supplied by Creative Labs, as are the Sound Blaster Live! Value sound card and the four-

point surround speakers. Amazingly, half of the display set is also from Creative, with the nVidia Riva TNT 2 Ultra-based graphics card pumping its signal to an ADI 19in monitor.

To get you surfing the net there's a Rockwell 56K modem, while a Gravis Xterminator Game Pad will help make the most of your leisure time.

One annoying feature of this machine is the position of the Wake, Sleep and Power off buttons on the keyboard. Rather than place these buttons out of the way, as

they are unlikely to be used that often, they are located where you would expect to find Insert, Home and Delete, pushing these keys down a row. The result is that even after a short period of use you will, out of habit, accidentally put your machine to sleep quite frequently.

**The system internals** were very tidy, with cables of an appropriate length being used

for their relevant connections. Mertec would have saved a fair amount by choosing a K6-III processor, but this saving doesn't seem to have filtered down to the customer. On the whole, performance and specification could have been better.

### PCW DETAILS

**Price** £1,398.25 (£1,190 ex VAT)

**Contact** Mertec Computers  
01792 473 7000

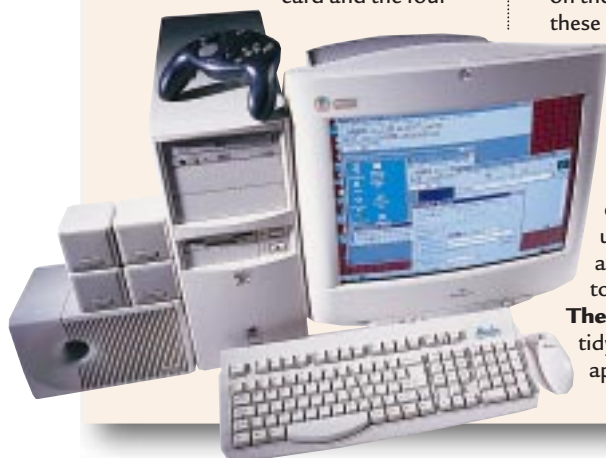
[www.mertec.co.uk](http://www.mertec.co.uk)

**Good points** Good sound system, good build quality

**Bad points** Sleep key where you expect to find Home key

**Conclusion** Can't really see where the saving on the processor has gone

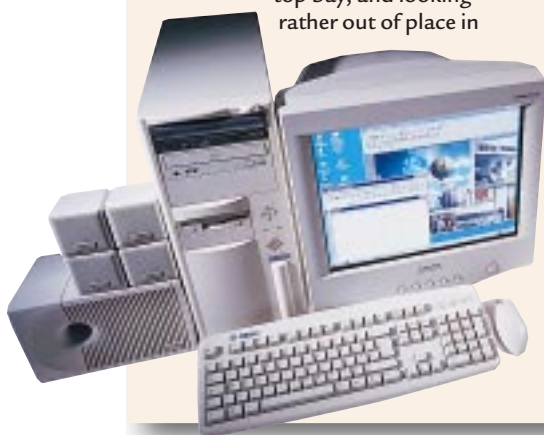
<b>Build Quality</b>	★★★★
<b>Performance</b>	★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★



## Mesh Computers Matrix 500CW

**Mesh was one of the few** contenders in this group test to stray from the Intel stable, supplying an AMD Athlon processor clocked at 500MHz, and this course of action has paid off. The Athlon is a formidable opponent to Intel's high-end processors, as the SYSmark results testify.

From the outside the case is uninspiring, but practical. One of the three 5.25in bays is free, while single internal and external 3.5in bays are also empty. Sitting in the top bay, and looking rather out of place in



this conservative case, is a metallic-silver Philips CD-RW – providing the removable storage and back-up – while below this is a six-speed Pioneer DVD-ROM drive.

The 13GB hard drive comes from Western Digital and the modem is a Diamond Supra Express V90. Mesh has opted for the 32MB Matrox Millennium G400 graphics card, as well as a 17in Mitsubishi monitor based on the Natural Flat technology. The result is very impressive image quality with almost no reflections. The captive monitor cable is a little disappointing though. Sound comes from the Creative Labs Sound Blaster Live! Value card, coupled with the Creative PC Works four-point surround speakers. **Inside, the build quality** is good, and the machine exhibited commendable upgrade options. The motherboard offered three vacant PCI slots and two vacant ISA slots for any legacy cards. The 128MB of RAM fills one of the three DIMM sockets.



Mesh has included a good set of peripherals, which should appeal to the home entertainment sector, but it's still more than capable of handling any office tasks. A solid component set and build quality make it definitely worth a look.

### PCW DETAILS

**Price** £1,408.82 (£1,199 ex VAT)

**Contact** Mesh Computers  
0181 208 4707

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

**Good points** Athlon processor, high-quality supporting components

**Bad points** Silver/grey colour of CD-RW

**Conclusion** A well-specified machine that performed well

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★★

## Panrix Athlon 550

**The Panrix Athlon 550** was the fastest machine on test. With a 550MHz AMD Athlon inside you'd be hard pushed to find any piece of software that won't run like a dream on it. However, this lightning-fast processor has been included at the expense of a well-rounded configuration, and the Athlon 550 is missing some of the high-quality supporting components seen in other systems.

Supporting the AMD CPU is 128MB of SDRAM that fills one of the three DIMM sockets. In the AGP slot you'll find a Matrox

Millennium G400 graphics card, but unfortunately it's the single-headed 16MB version, instead of the Max or even the standard 32MB model. That said, this card is still more than powerful enough to get the best out of the Viewsonic E771 monitor. This 17in shadow mask unit gives a clear picture, but the screen is noticeably rounded, especially when compared to the latest flat CRT screens.

Sound comes courtesy of the ubiquitous Sound Blaster Live! Value card. This is pretty much the standard in PC sound and has an impressive array of effects and features. Sadly, the CD audio cable hasn't been routed very thoughtfully and it obstructs the two ISA slots. Below the sound card is a Diamond SupraExpress 56i modem, so Internet connection is well taken care of.

A 13GB IBM hard disk takes care of storage, while a six-speed AOpen DVD-ROM drive is more than adequate for software installs and movie watching. Lotus

SmartSuite Millennium and a one-year on-site warranty – both decent inclusions – round off the package.

Ultimately though, regardless of the speed, Panrix has made a few too many compromises. But if raw speed is what you're after, it should be right up your street.

### PCW DETAILS

**Price** £1,410 (£1,200 ex VAT)

**Contact** Panrix 01332 444 358  
[www.panrix.com](http://www.panrix.com)

**Good points** Very fast

**Bad points** Sparse supporting configuration

**Conclusion** A powerhouse machine but the spec could have been more rounded

<b>Build Quality</b>	★★★
<b>Performance</b>	★★★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★★



## Quantex Microsystems Game 500 XE

Quantex has produced a solid contender, which comes in a good £100 under the specified price point. The machine is based on a 500MHz Pentium III with 128MB of RAM on a Biostar motherboard. Maxtor supplies the ample 17.2GB of hard disk space, and removable storage is well taken care of by a Sony CD-RW.

There's a six-speed Toshiba DVD-ROM drive for software installs and watching movies, while sound is handled by an Aureal Vortex 2 sound card coupled with a set of Altec Lansing speakers. The



overall result of this combination was impressive. A 16MB Voodoo3 3000 graphics card, used in combination with a Quantex 19in monitor, provided a very respectable display. Quantex has made an effort to simplify the on-screen display, but has actually succeeded in making it worse, by supplying a pseudo jog dial that is unintuitive to use. Connection to the Internet is via a 3Com/US Robotics internal V90 modem. **Two 64MB DIMM** modules occupy two of the three available slots on the motherboard, but we would rather have seen one 128MB DIMM (although we have been told that one 128MB DIMM will be used on retail models). In terms of expansion, there are two PCI and three ISA slots free, as well as one shared slot.

The Quantex case is very roomy, and offers good upgrade potential, with two free 5.25in bays and three free internal 3.5in bays. The only fault is the lack of a free 3.5in external bay.



Inside, build quality was good, with the cables well positioned to allow upgrading. The DVD-ROM, CD-RW and modem are connected internally to the sound card, which shows attention to detail.

### PCW DETAILS

**Price** £1,291.33 (£1,099 ex VAT)

**Contact** Quantex Microsystems  
01438 224444  
[www.qtx.co.uk](http://www.qtx.co.uk)

**Good points** CD-RW, good attention to detail, £100 below the maximum price (ex VAT)

**Bad points** Hard to use OSD on monitor

**Conclusion** This machine covers most bases and comes in cheaper than the rest of the competition

<b>Build Quality</b>	★★★★★
<b>Performance</b>	★★★
<b>Value for Money</b>	★★★★
<b>Overall Rating</b>	★★★★

## Wired for sound and vision

DVD-ROMS, 3D graphics cards and modems have become standard items in today's home PC, but the PC of the future will be more integrated into your home entertainment system thanks to HAVi (Home Audio/Video interoperability).

The aim of HAVi is to create a standard by which all home entertainment devices can be connected and communicate. Typical devices that will implement HAVi are digital televisions, digital videos, set-top boxes, cable modems and digital cameras. HAVi will make it easy to create a home entertainment network that can be controlled from a central point and will ensure interoperability of all machines – regardless of the manufacturer or type of device. The home PC is not required for a HAVi network to operate, nor is it restricted from playing a part.

The backbone of the network is built around the IEEE 1394 (or FireWire) standard. This provides sufficient



bandwidth for real-time AV streams (such as MPEG2) and supports hot plugging, which allows devices to be added or removed from the network while it is still running. The software platform for HAVi is based around an open and standardised Java. As a result, the functionality of a HAVi device is down to what the manufacturer chooses to implement. Devices fall into

two categories: Full AV devices (FAVs), which support Java applications; and less expensive Intermediate AV devices (IAVs), which will only be able to execute native applications.

The possibilities

that the system can offer are quite staggering. You could, for example, program the VCR in the living room from the TV in the bedroom. Forgotten to set up *Eastenders* to record? – not a problem, email your computer and ask it to tape it for you.

▲ HAVI AIMS TO CREATE A COMMON STANDARD FOR HOME ENTERTAINMENT KIT

## Simply Computers System AX 3500

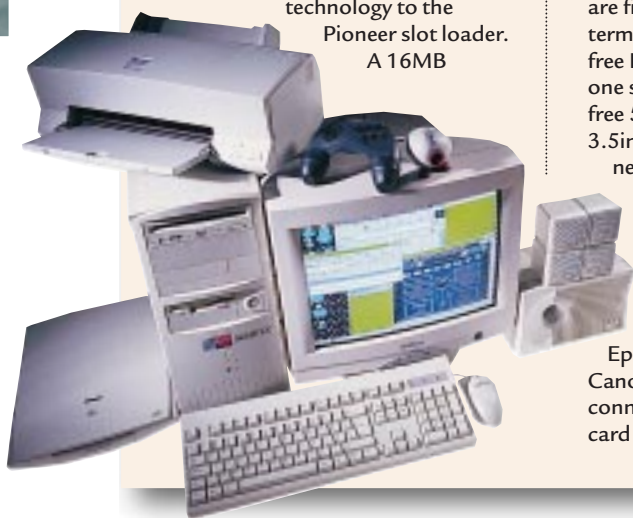
**Simply has put forward a** 500MHz Pentium III with 128MB of RAM resident in a SuperMicro motherboard. The ample 17.3GB Fujitsu hard drive is more than adequate for the majority of users, but no provision has been made for removable storage. Creative Labs provides the speakers, along with a Sound Blaster Live! Value sound card. The six-speed AOpen DVD-ROM drive shares similar

technology to the Pioneer slot loader. A 16MB

Voodoo3 3000 graphics card provides fast performance in both 3D games and 2D business applications. Unfortunately, the 17in Belinea monitor can't really show the Voodoo card off to its best effect. Internet connection is also catered for by a Diamond Supra Express V90 modem, so you'll be able to download all the latest drivers for your PC.

Two of the three DIMM sockets are free for future upgrades. In terms of expansion, there are three free PCI slots and three ISA with one slot shared. The case offers two free 5.25in bays and one external 3.5in. The power cables have been neatly tied but placed directly over the motherboard, which hinders access to the processor.

Simply has chosen to bundle a lot of peripherals with this machine. There's an Epson Stylus 640C printer, a Canon CanoScan FB320P scanner connected to the supplied SCSI card and a Philips USB camera.



**This makes the Simply** a very well-rounded system, although the similarly specified Dan shipped with superior peripherals. That said, it's another one-stop solution to consider if you don't want to waste time and money buying peripherals after you've purchased your PC.

### PCW DETAILS

**Price** £1,410 (£1,200 ex VAT)

**Contact** Simply Computers

08707 297366

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

**Good points** Large bundle (printer, scanner, USB camera)

**Bad points** No removable storage

**Conclusion** A good selection of peripherals, but the Dan is more attractive

<b>Build Quality</b>	★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★

## Time Computers 550-3t SV

**Time has managed to fit a lot** into this system for the price. The processor is a Pentium III 550MHz backed up by 128MB of RAM. There's a fast 10GB hard disk from IBM spinning at 7,200rpm. Connected to the secondary EIDE channel is an LG CD-RW and a Toshiba DVD-ROM. The former will let you back up, transport and archive data, while the latter will make short work of installs, as well as playing movies.

Time has opted for a Matrox Millennium G400 dual head, which

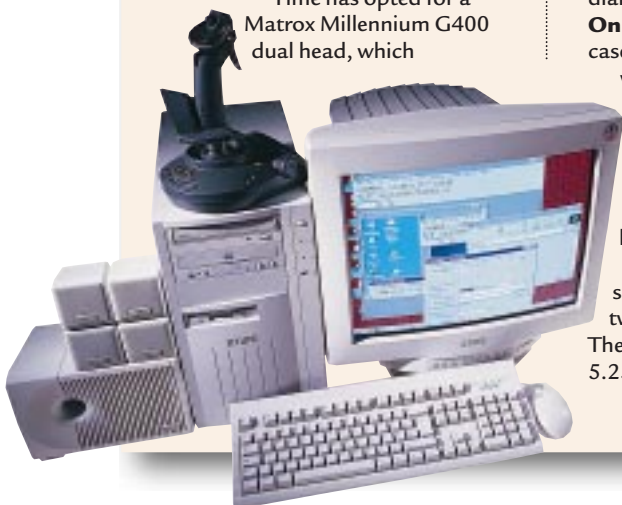
is a formidable card, allowing you to display one image on the 19in CTX monitor and a completely different image on a TV screen.

This detail firmly places this machine in the home entertainment sector, allowing for DVD movies to be shown on a conventional TV, which are then brought to life by the Aureal Vortex 2 sound card and PC-Works four-point surround speaker system. A PCI V90 modem from Etech has been chosen for the dial-up connection.

**On the inside,** the design of the case has been poorly thought out, with the power supply completely obscuring the main board. The only way to gain access to the processor or RAM slots is to remove the power supply completely, which is hardly ideal.

Two of the three DIMM sockets are empty, along with two PCI and three ISA slots. There is also one 3.5in and two 5.25in drive bays free.

Time has put together a system



that covers all of the areas that an ultimate home machine should. We were a bit disappointed with the power supply obscuring access to the motherboard, but this is a minor point when you consider the power and value delivered.

### PCW DETAILS

**Price** £1,410 (£1,200 ex VAT)

**Contact** Time Computers

01282 777 555

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

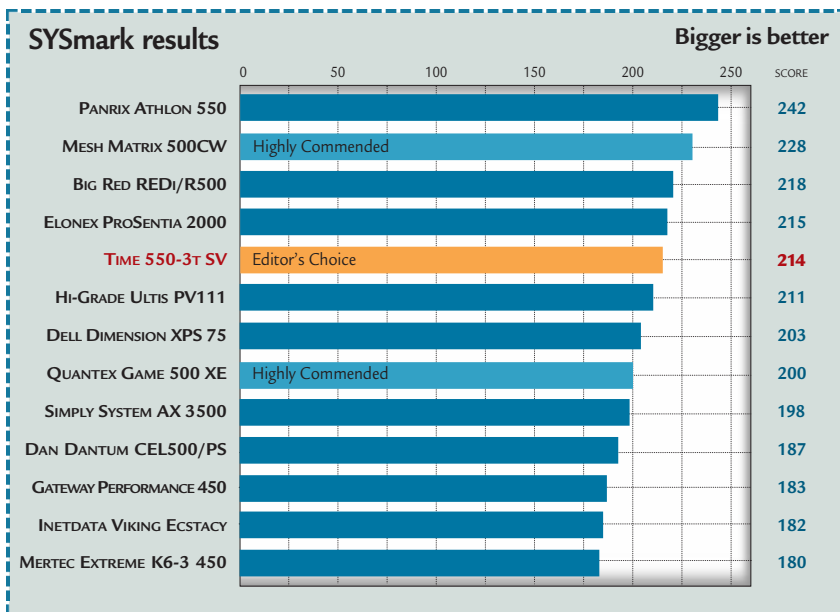
**Good points** Matrox Millennium Dual Head, Pentium III 550MHz, CD-RW

**Bad points** Poorly designed case

**Conclusion** A good machine clearly aimed at the home entertainment market

<b>Build Quality</b>	★★★★
<b>Performance</b>	★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

# PCW Labs Report



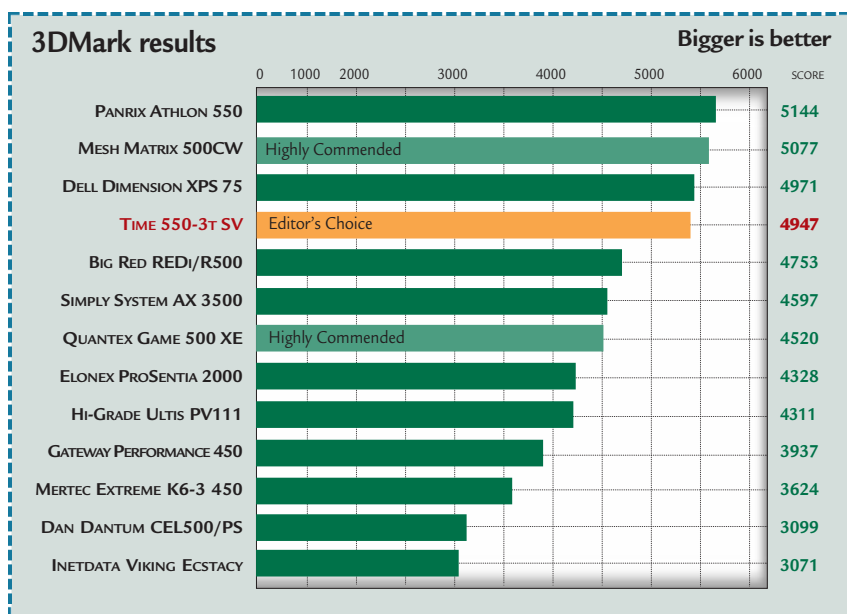
After last month's Athlon debut, AMD has proved once more that its seventh-generation chip is more than a match for Intel's products. The two Athlon-based machines rose to the top of the SYSmark chart, even though the chip in the Mesh actually ran 50MHz slower than some of the Pentium III processors on test. However, speed isn't the be all and

end all when buying a PC, and even though the Panrix was considerably faster than any of the other machines, it lacked some of the features seen elsewhere. That said, if you're looking for all-out speed, the Panrix won't disappoint. Ultimately, the Time gives a good balance of features and performance, helping it win the Editor's Choice and making it a desirable product.

All the machines in this test are supposed to cover every aspect of home computing. That means office applications, home entertainment and games. The PC is now a major games platform and anyone buying one will expect to be able to play all the latest titles. The 3DMark test evaluates the Direct 3D performance of each of the systems on test.

Unsurprisingly,

the two Athlon machines came out on top again. Having a heavy-duty CPU does wonders for 3D performance, as even the best graphics card can only work as fast as the CPU supporting it. The key is to marry a fast graphics solution and CPU together, so that the graphics card is never left waiting for information. Again, Time's machine performed well.



## How we did the tests



■ **SYSmark** measures the time it takes a PC to perform tasks in 14 common office and content-creation apps. Each test is run three times to ensure consistency. Tests include:

➤ **Office productivity:** CorelDraw 8, Excel 97, NaturallySpeaking 2.02, Netscape Communicator 4.05, OmniPage Pro 8.0, Paradox 8, PowerPoint 97 and Word 97.

➤ **Content Creation:** MetaCreations Bryce 2, Avid Elastic Reality 3.1, Macromedia Extreme 3D 2, Photoshop 4.01, Adobe Premiere 4.2, and XingMPEG Encoder 2.1.

■ **3DMark99 Max** is an instruction-set optimised version of 3DMark99 from Futuremark Corporation, which tests the

3D capabilities of PCs. When applicable, the suite of tests will draw on AMD's 3DNow! or Intel's KNI instruction sets. It uses a Real World DirectX 6.1 3D game engine to produce one result from a balanced testing methodology that includes image quality, rendering speed, CPU capability and, depending on hardware support, a test for embossed bump-mapping. All tests are performed at 1,024 x 768 resolution in 16-bit colour depth with the test suites set to loop three times. The higher the score, the better the result. However, due to the implementation of instruction-set optimisation, the results from the original 3DMark99 and the Max version are not comparable. See [www.3dmark.com](http://www.3dmark.com).

# Table of features



MANUFACTURER	BIG RED	DAN TECHNOLOGY	DELL	ELONEX	GATEWAY	HI-GRADE
MODEL NAME	REDI/R500	DANTUM CEL500/PS	DIMENSION XPS 75	PROSENTIA 2000	PERFORMANCE 450	ULTIS PVIII
Price (ex VAT)	£1,199	£1,200	£1,199	£1,195	£1,167	£1,199
Price (Inc VAT)	£1,408.82	£1,410	£1,408.82	£1,404.13	£1,412.07	£1,408.82
Telephone	08700 711 117	0181 830 1100	0870 152 4350	0800 542 2931	0800 552 000	0181 532 6123
Fax	08700 733 337	0181 830 1122	N/A	0181 452 7444	3531 802 3000	0181 532 6110
Web address	<a href="http://www.bigred.co.uk">www.bigred.co.uk</a>	<a href="http://www.dan.co.uk">www.dan.co.uk</a>	<a href="http://www.dell.co.uk">www.dell.co.uk</a>	<a href="http://www.elonex.co.uk">www.elonex.co.uk</a>	<a href="http://www.gateway.com/uk">www.gateway.com/uk</a>	<a href="http://www.higrade.com">www.higrade.com</a>
<b>HARDWARE SPECS</b>						
Processor	Intel Pentium III	Intel Celeron	Intel Pentium III	Intel Pentium III	Intel Pentium III	Intel Pentium III
	550MHz	500MHz	500MHz	550MHz	450MHz	550MHz
RAM/Type	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM
Occupied/Spare RAM Slots	1/3	1/2	1/2	1/1	2/1	1/2
Max memory in this configuration	896MB	640MB	640MB	384MB	384MB	640MB
Max supported by motherboard	1GB	768MB	768MB	512MB	768MB	768MB
Hard Disk (manufacturer + model)	Quantum Fireball CR	Western Digital Expert 418000	Maxtor 4209808	Fujitsu MPD3113AH	Western Digital Caviar	Maxtor 91303D6
HD Size/Interface	13GB/EIDE	18GB/EIDE	20GB/EIDE	13.7GB/EIDE	13GB/EIDE	13GB/EIDE
Storage drive model + manufacturer	N/A	Matshita LS-120	lomega Zip	Panasonic LS-120	N/A	N/A
Size of storage drive media	N/A	120MB	250MB	120MB	N/A	N/A
Storage drive interface	N/A	EIDE	EIDE	EIDE	N/A	N/A
<b>MOTHERBOARD COMPONENTS</b>						
Motherboard Manufacturer	Asus	Supermicro	Intel	MSI	Intel	Asus
L2 Cache	512KB	128KB	512KB	512KB	512KB	512KB
No of 3.5/5.25in bays	3/3	2/3	3/2	2/2	2/2	2/3
No of free 3.5/5.25in bays	1/2	1/2	2/2	1/1	1/1	1/2
No of PCI/ISA/shared slots	6/1/1	4/3/1	4/1/1	3/1/1	5/1/1	4/3/1
No of free PCI/ISA/shared slots	4/1/1	3/2/1	2/1/1	2/1/1	2/1/0	1/3/1
No of USB/Serial/Parallel/PS2	2/2/1/2	2/2/1/2	2/1/1/2	2/2/1/2	2/2/1/2	2/2/1/2
<b>MULTIMEDIA</b>						
CD-ROM manufacturer/model	Pioneer DVD-103S	Creative DVD 6240E	Toshiba SD-M1212	Sony DDU220E	Panasonic SR-8584-B	Hitachi GD2500
CD-ROM speed/interface	6x DVD; 32x CD/EIDE	6x DVD; 24x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE
Sound card manufacturer	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Creative Labs
Sound card model	SB Live! Value	SB Live! Value	SB Live! Value	ES1373 64 Voice PCI	Audio PCI 64V	SB Live! Value
Speakers (manufacturer + model)	Big Red Computers	Creative 4 Point Surround	Altec Lansing ACS 340	Altec Lansing ACS 48	Boston Media Digital Media Theatre	Samsung SMS-5100
Graphics card	3dfx Voodoo3 3000	ATI All-In-Wonder 128	Diamond Viper V770D	Winfast 3D S320 II	STB Riva TNT-2	Asus V3800
Chipset	Voodoo 3	Rage 128	Riva TNT-2	Riva TNT-2	Riva TNT-2	Riva TNT-2
RAM/Max RAM and type	16MB/16MB/SDRAM	16MB/32MB/SDRAM	32MB/32MB/SDRAM	32MB/32MB/SDRAM	32MB/32MB/SDRAM	32MB/32MB/SDRAM
Graphics card interface	AGP	AGP	AGP	AGP	AGP	AGP
Monitor manufacturer/model	Viewsonic E771	CTX PR700	Phillips Mago	Elonex MN044	Gateway EV700	LG Flatron 795ft plus
Monitor size/max viewable diagonal	17in/16in	17in/15.7in	19in/18in	17in/15.7in	17in/15.9in	17in/16in
Max resolution and refresh	1,280 x 1,024@66Hz	1,280 x 1,024@66Hz	1,600 x 1,200@75Hz	1,600 x 1,200@60Hz	1,280 x 1,024@60Hz	1,600 x 1,200@75Hz
<b>OTHER INFORMATION</b>						
Modem manufacturer and model	Diamond SupraExpress	Rockwell ACF II	Aztech 56K	3Com Winmodem	GVC Telepath 56K	Accord 56K
Highest supported modem standard	V90	V90	V90	V90	V90	V90
Misc hardware	N/A	MS Sidewinder Gamepad HP4100 Scanner Epson Stylus 740 printer	N/A	MS Sidewinder Joystick	Epson Stylus Color 440 printer	Dexxa f22x TV Tuner card with Teletext
Bundled software	Lotus SmartSuite Millennium	Lotus SmartSuite Millennium Five 3D Games	MS Works Suite Gamer Elite II	MS Works Suite 99 Age of Empires CART Precision Racing Flight Simulator 99	MS Works Suite Ultra Games	Norton Antivirus/Ghost Lotus SmartSuite Millennium Games Pack
Standard warranty	1yr on-site	1yr on-site	1yr on-site, 2yr CR	1yr RTB	1yr on-site, 2yr RTB	1yr on-site
Warranty options	3yr on-site	3yr on site	1yr on-site, 2yr CR	1-3yr on-site or RTB	3yr on-site, 2yr on-site	3yr on-site
Technical support tel no	08700 722 227	0181 830 1100	0870 908 0800	0181 452 6666	0800 802 000	0181 532 6199
Sales hours	Mon-Fri 9am-6pm	Mon-Fri 8.30am-7pm	Mon-Fri 8am-8pm Sat 10am-4pm, Sun 2pm-6pm	Mon-Fri 8.30am-6.30pm Sat 9am-1.30pm	Mon-Fri 8am-10pm Sat 8am-6pm	Mon-Fri 9am-5.30pm
Technical support hours	Mon-Fri 9am-6pm	Mon-Fri 9.30am-6pm	Mon-Fri 8am-8pm	Mon-Fri 8am-8pm Sat 9am-1.30pm	Mon-Fri 8am-10pm Sat 8am-10pm	Mon-Fri 9am-5.30pm





	INETDATA	MERTEC COMPUTERS	MESH	PANRIX	QUANTEX	SIMPLY	TIME
	VIKING ECSTASY	EXTREME K6-III 450	MATRIX 500CW	ATHLON 550	GAME 500 XE	SYSTEM AX 3500	TIME 550-3T SV
	£1,199	£1,190	£1,199	£1,200	£1,099	£1,200	£1,200
	£1,408.82	£1,399	£1,408.83	£1,410	£1,291.33	£1,410	£1,410
	01372 470 777	01792 473 7000	0181 208 4707	01332 444 358	01438 224 444	08707 297 366	01282 777 555
	01372 470 444	01792 473 888	0181 208 4493	01332 444 962	01438 224 224	08707 274 002	01282 770 844
	<a href="http://www.inetdata.co.uk">www.inetdata.co.uk</a>	<a href="http://www.mertec.co.uk">www.mertec.co.uk</a>	<a href="http://www.meshplc.co.uk">www.meshplc.co.uk</a>	<a href="http://www.panrix.com">www.panrix.com</a>	<a href="http://www.qbx.co.uk">www.qbx.co.uk</a>	<a href="http://www.simply.co.uk">www.simply.co.uk</a>	<a href="http://www.timecomputers.com">www.timecomputers.com</a>
	Intel Pentium III	AMD K6-III	AMD Athlon	AMD Athlon	Intel Pentium III	Intel Pentium III	Intel Pentium III
	450MHz	450MHz	500MHz	550MHz	500MHz	500MHz	550MHz
	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM	128MB/SDRAM
	1/3	1/2	1/2	1/2	2/1	1/2	1/2
	896MB	640MB	640MB	640MB	384MB	640MB	640MB
	1GB	768MB	768MB	768MB	768MB	768MB	768MB
	IBM	IBM	Western Digital	IBM	Maxtor	Fujitsu	IBM
	DTTA-371440	DTTA-351680	WDAC31300	DJNA-371350	91728D8	MPD3173AT-UD	DTTA-371010
	14.4GB/EIDE	16.8GB/EIDE	13GB/EIDE	13GB/EIDE	17.2GB/EIDE	17.3GB/EIDE	10GB/EIDE
	N/A	N/A	Philips CDRW200	N/A	Sony CRX100E	N/A	LG CED-4081B CD-RW
	N/A	N/A	650Mb	N/A	650Mb	N/A	650Mb
	N/A	N/A	EIDE	N/A	IDE	N/A	EIDE
	Abit	FIC	MSI	MSI	Biostar	Supermicro	Supermicro
	512KB	512KB	512KB	512KB	512KB	512KB	512KB
	3/3	4/3	2/3	3/2	3/4	2/3	3/3
	1/2	2/2	1/1	1/1	2/2	1/2	1/1
	5/2/1	4/2/1	5/2/1	5/2/1	4/3/1	4/3/0	4/3/1
	3/1/1	2/2/1	3/2/1	3/2/1	2/3	1/2/0	2/3/1
	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2	2/2/1/2
	Pioneer DVD-113	Creative DVD-5240E	Pioneer DVD-113	AOpen DVD-9632	Toshiba SD-M1212	AOpen DVD-9632	Toshiba SD-M1212
	6x DVD; 32x CD/EIDE	5x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE	6x DVD; 32x CD/EIDE
	Creative Labs	Creative Labs	Creative Labs	Creative Labs	Aureal Semiconductor	Creative Labs	Aureal
	SB Live! Value	SB Live! Value	SB Live! Value	SB Live! Value	Vortex 2 PCI	SB Live! Value	Vortex2 Superquad
	Yamaha	Creative	Creative	Yamaha	Altec Lansing	Creative	Creative
	YST100 and YST28	4 Point Surround	4 Point Surround	YST-M20	ACSA 45.1	FPS1000	4 Point Surround
	Elsa Erazor II Revelator	Creative 3D Blaster	Matrox Millennium G400	Matrox Millennium G400	3dfx Voodoo3 3000	3dfx Voodoo3 3000	Matrox Millennium G400
	Riva TNT-2	Riva TNT-2 Ultra	MGA400	MGA400	Voodoo 3	Voodoo 3	MGA400
	16MB/32MB/SDRAM	32MB/32MB/SGRAM	32MB/32MB/SDRAM	16MB/32MB/SDRAM	16MB/16MB/SDRAM	16MB/16MB/SDRAM	32MB/32MB/SGRAM
	AGP	AGP	AGP	AGP	AGP	AGP	AGP
	Hansol 900P	ADI G66	Mitsubishi Diamond 710NF	Viewsonic E771	Quantex XP190N	Belinea 103040	CTX VL950T
	19in/18in	19in/18in	17in/16in	17in/16in	19in/18in	17in/15.8in	19in/18in
	1,600 x 1,200@60Hz	1,600 x 1,200@75Hz	1,600 x 1,200@75Hz	1,280 x 1,024@66Hz	1,600 x 1,200@75Hz	1,600 x 1,200@65Hz	1,600 x 1,200@75Hz
	Rockwell 56K Internal	Rockwell 56K Internal	Diamond SupraExpress	Diamond SupraExpress	3Com US Robotics	Diamond SupraExpress	Etech 56k PCI 56RVP
	V90	V90	V90	V90	V90	V90	V90
	Elsa LCD 3D Specs	Gravis Xterminator	Mesh Webcruiser		MS Sidewinder Joystick	Canon CanoScan FB320P	Saitek joystick
	RealMagic Hollywood	Gamepad	Mouse			scanner, Epson Stylus	
	Hware DVD AC-3 Card		(scroll wheel)			640 printer, Philips camera	
	Need for Speed III	MS Works Suite 99	Corel Word Perfect	Lotus SmartSuite	Corel Office Suite 8	Lotus SmartSuite 97	Lotus SmartSuite Millen
	Recoil	Star Wars:	Office 2000		Cinemaster DVD		GSP Suite, Norton
	3D Games	Phantom Menace			Multimedia Bundle		AntiVirus, IBM ViaVoice
					Activision Games Bundle		Exec, 14 multimedia titles
	3yr RTB	2yr RTB	1yr on-site	1yr on-site	1yr RTB	1yr on-site	1yr RTB
	3yr on-site	1yr on-site	3yr on-site	3yr on-site	3yr on-site	3yr on-site	3yr and 5yr RTB
	01372 470 999	01792 772 111	0181 208 4795	0113 244 4948	0845 359 9559	0181 498 2170	01282 770 033
	Mon-Sat 8.30am-10pm	Mon-Fri 9am-5.30pm	Mon-Fri 9am-6pm	Mon-Fri 9.30am-5.30pm	Mon-Fri 9am-6pm	Mon-Fri 8am-8pm	Mon-Fri 8.30am-7.30pm,
			Sat 10am-4pm	Sat 10am-4pm		Sat 9am-5pm	Sat 8.30am-5.30pm
			Sun 10am-2pm			Sun 10am-4pm	Sun 10am-4pm
	Mon-Sat 8.30am-10pm	Mon-Fri 9am-5pm	Mon-Fri 9am-6pm	Mon-Fri 9.30am-5.30pm	Mon-Sun 24 Hours	Mon-Fri 9am-7pm	Mon-Fri 8.30am-8pm
						Sat 9am-4pm	Sat-Sun 9am-5pm

# Editor's Choice

The specification of the machines that we received for this group test varied wildly – from some manufacturers submitting good machines with well chosen peripherals, to others just throwing a system together without really considering what it had to do.

We were more impressed by machines that covered all the areas that an ultimate home PC would be used for rather than just a fast machine, as all of those on test were up to the job of running the latest games and playing DVD movies. But where a manufacturer had opted for a slower processor, we wanted to see where this saving had gone.

We were happy to see that some manufacturers were taking the need for removable storage seriously, with Zip, CD-RW and LS-120 drives featuring prominently. We also viewed upgradeability as a key issue, as these machines will no doubt want the most recent bits of kit added to them later in their lifetime. The availability of free expansion slots and spare drive bays showed that this issue had been considered. Ease of access was another



◀ **TIME'S WELL ROUNDED 550-3T SV SYSTEM: A GOOD MACHINE WITHOUT SKIMPING ON POWER**

kept from the top spot by the Time. The Mitsubishi Diamond Pro 710 NF was a formidable display, which should win a few admirers. We were very impressed by the performance of AMD's Athlon processor, and Mesh has made a wise choice in this department.

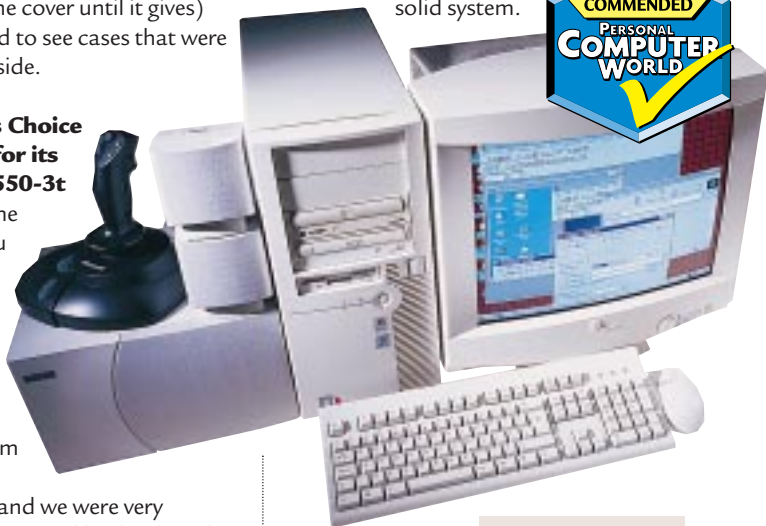
The Philips CD-RW had an unusual colour scheme, but you could get used to it, and the Matrox Millennium G400 backed up Mesh's solid system.

priority (nobody enjoys trying to find the six screws at the back and then wrestling with the cover until it gives) and we also liked to see cases that were neat and tidy inside.

▶ **The Editor's Choice goes to Time for its well rounded 550-3t SV system.** Time showed that you can supply a good machine without skimping on processor power. This 550MHz Pentium III-based system performed well and we were very

impressed by the thought that had gone into the other aspects of the system. The Matrox Millennium Dual-head card performed well in the 3D tests, and the addition of a second output allows the machine to be put to a variety of uses. The 19in monitor and the CD-RW put the icing on the cake.

▶ **The Mesh Matrix 500CW is Highly Commended** and it was a strong contender for Editor's Choice, but just



▶ **QUANTEX'S GAME 500 XE WAS A GOOD SYSTEM WHICH CAME IN £100 UNDER BUDGET (EX VAT)**

▶ **Quantex also deserves a Highly Commended award for its Game 500 XE**

system. The 500MHz Pentium III-based machine included a Sony CD-RW, 19in monitor, 17GB hard drive and very good attention to detail in build quality. The machine offered good upgradeability and came in at £100 less than our maximum price of £1,200 (ex VAT).

A final word has to go to Dan. Although Dan didn't quite grab an award, it did produce a superb home solution that's well worth investigating.

▼ **THE MESH MATRIX 500CW CAME WITH AN IMPRESSIVE MITSUBISHI DIAMOND PRO 710 NF DISPLAY**





ACCOUNTING >>  
group test



Illustration by Kevin O'Keefe

# It's what counts

Gone are the days of **entering row after row** of figures into a ledger. Today's accounting software caters for both personal records and small businesses, and here we round up the best.

If you are using a paper-based system or starting a new business, opting for a dedicated accounting package might seem daunting. However, the days when software was more complicated than a paper ledger are largely gone, and the advantages are huge. Computerised accounting software can save you an enormous amount of time. Instead of an afternoon adding up columns (and miscounting), everything is automatically totalled up on the fly. Even better, software can provide information very quickly – you can ask it how much you spent at a particular shop in January.

**The main advantage** of using an accounting package over, say, Microsoft Office, is that it integrates a spreadsheet, database and word processor into a single program. It has spreadsheet-style facilities for tracking purchases and sales, a database for keeping details of suppliers and customers, and the features of a word processor for producing invoices. Whereas producing invoices in Microsoft Word results in typing the same data separately into a spreadsheet, by using an accounts package you only have to type the information once.

In this group test we have examined

six small business packages, and also taken a look at Money and Quicken, which help with personal finances.

## Contents

- 174** **Company accounting software:** DO\$H CashBook, BestWare MYOB, Pegasus Capital Lite, Intuit QuickBooks 6, Sage Instant Accounting, TAS Books Accounting
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- 176** Sales ledger accounts
- 176** VAT handling
- 181** Help and Drill down
- 182** **Personal accounting software:** Intuit Quicken 2000, Microsoft Money
- 183** Choosing the right package and Year 2000 compliance
- 184** Table of features
- 187** **Editor's Choice**

• *Written by Alex Singleton*

## Ratings

- ★★★★★ **Highly recommended**
- ★★★★ **Great buy**
- ★★★ **Good buy**
- ★★ **Shop around**
- ★ **Not recommended**

# Small business software

Smaller organisations may prefer a simple package, but they'll still need a raft of features.

The six small business products reviewed here have been selected for their appropriateness to a business of up to around 10 people. TAS Books Accounting is the most powerful product, while Intuit QuickBooks and MYOB claim to take the jargon out of accounting. Pegasus Capital Lite and Sage Instant Accounting come from a very good pedigree, with Sage being the world's largest supplier of accounting programs. Both Capital Lite and Instant Accounting are essentially cut-down versions of their publishers' higher-end programs.

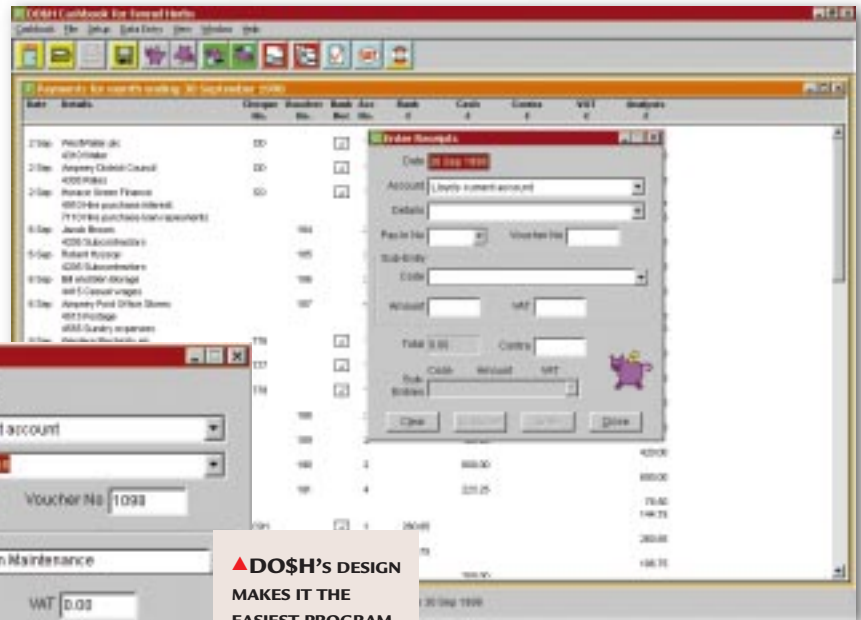
DO\$H CashBook is the odd-one-out, aimed at small businesses simply wanting an automated version of a paper ledger book. It is only suitable for businesses using the VAT cash accounting scheme, where VAT is due on the date of payment, rather than the usual accrual scheme, where VAT is due on the date of invoice. DO\$H is incredibly simple to learn, with two main windows – one for entering payments and one for income.

Here we are reviewing the single-user versions, but all the publishers (except in the case of DO\$H CashBook) produce either a multi-user version (TAS Books Accounting, MYOB and QuickBooks) or have a higher-end program to cater for this (Sage and Pegasus).

## Creating a company

When creating a new company in the software, the packages all use some form of wizard to take basic information about the business. It is vital that proper advice is given either on paper or on screen explaining how to set it up, because it can be difficult or impossible to change these items once they have been entered.

Very impressively, TAS Books takes the trouble to explain the difference between the cash accounting scheme for VAT and the accrual system, including a



chapter in the manual for a more detailed explanation. It also recommends contacting an accountant if in any doubt.

Instant Accounting, along with QuickBooks and MYOB, has a very straightforward wizard for this. When creating a new customer through Instant Accounting's customer record wizard, we were delighted that it asks if there are any outstanding invoices or credit notes and whether the user would like to enter them as individual items or as a single value.

Capital Lite has an impressive amount of on-screen help while setting up the company (unfortunately, not found elsewhere in the program), but it does become quite tiresome not being able to tab into the next field.

Once this wizard has been completed, the user is placed in an 'opening balance mode' in which outstanding invoices and credit notes should be entered. This was a less intuitive process than offered by the other programs reviewed here.

Navigating the user interfaces in accounts software can be confusing.

Only MYOB and QuickBooks offer a graphical navigator, allowing users to click on a tab and get to the facilities they require. The button bar icons in Instant Accounting are very clear, but with some of the other packages working out what they do is guesswork. The menu structure in TAS Books was easily the best – it was very easy to track down the required window.

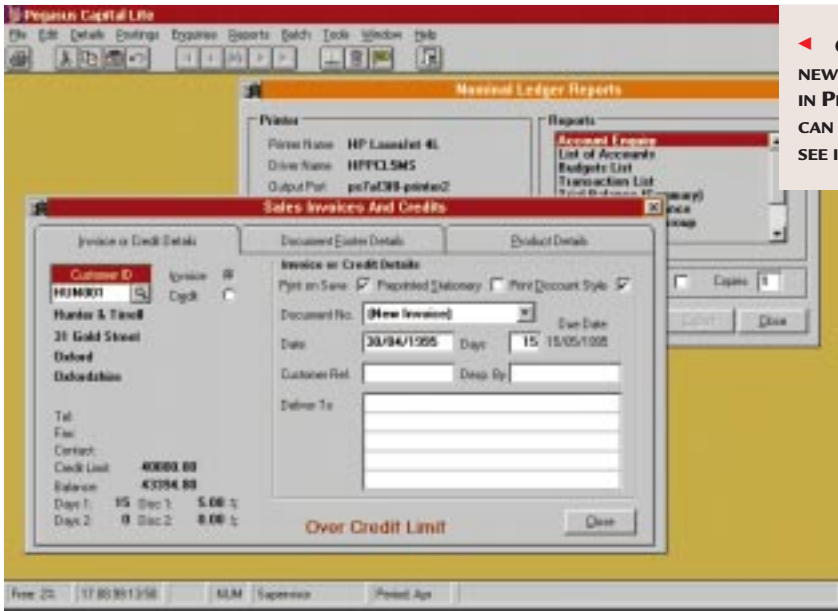
## Nominal ledger

The layperson can think of nominal ledger accounts – a key part of double-entry jargon – simply as categories. All but one of the programs allow you to split each transaction (in the purchase and sales ledgers) into multiple categories. For example, a single invoice from a supplier might contain some stationery (which you might

**The layperson can think of nominal ledger accounts simply as categories**

categorise as 'stationery') and some machinery (which you might

categorise as 'plant'). However, Sage Instant Accounting only allows you to give each entry a single category. If you wanted to split the transaction between different categories, you would have to enter it as two or more separate invoices, which can cause some confusion later on.



◀ **CREATING A NEW SALES INVOICE IN PEGASUS, WHICH CAN BE TRACKED TO SEE IF IT IS OVERDUE**

purchased from. (Accounts packages have cashbooks to enter all the money-related transactions that do not belong in the sales or purchase ledgers. Usually

this means items which have been bought by petty cash, or for cash takings.)

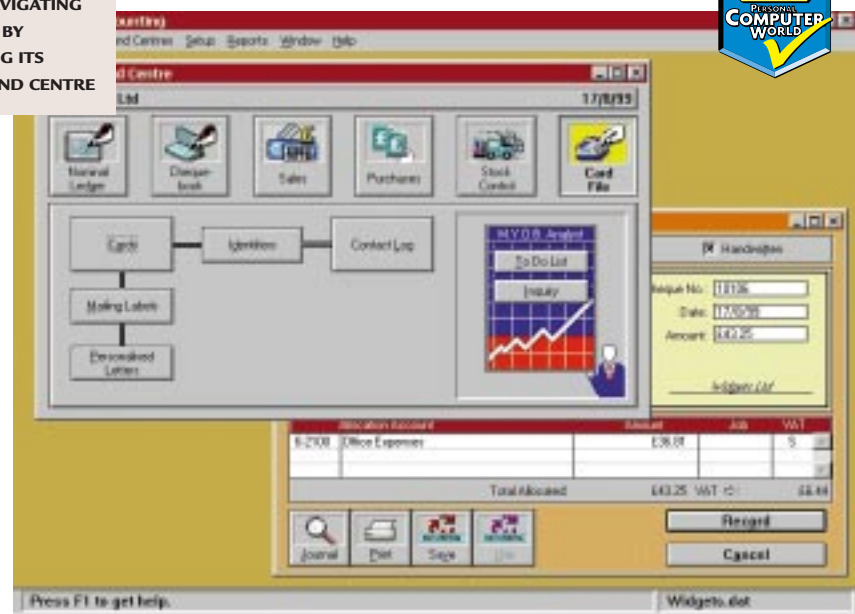
Being a cashbook-only program, DO\$H does not attempt to track purchase invoices. Its approach to the purchase ledger is to show the equivalent of a sheet of paper listing the transactions in any month. This metaphor makes the package similar to working with a paper system, helping to address the concern that computerising the books makes it more difficult to see what is happening. However, despite being incredibly easy to use, DO\$H is not as sophisticated as it could be. Whereas programs aimed at the home user – like Microsoft Money – let you type entries directly into this page, DO\$H makes you enter them into a dialog box. Also, this dialog box isn't as efficient as it could be – if you start typing in a supplier's name, DO\$H does not try to automatically complete the name. Data entry is therefore more long-winded than it should be, although there are no problems in tracking suppliers as it does not keep a supplier database in a significant way. DO\$H's main strength is that it is incredibly uncomplicated for the inexperienced user to alter a mistake: they just double click on the appropriate entry in the purchase ledger. It is undeniable that DO\$H is easier than any of the other

Most of the programs reviewed require the use of numeric codes in order to categorise entries. With Sage, Pegasus, MYOB, DO\$H and TAS, you have to type in a number or choose the category from a menu. Only with QuickBooks can you type a word into the category field, which saves time. QuickBooks also tries to automatically complete the category for you, so if you enter 'Conf', it will work out that you are typing 'Conference sales'. You can simply tab into the next field to accept the suggestion. That said, TAS and MYOB (along with QuickBooks) automatically enter the category selected the last time the customer or supplier was used. Sage, conversely, lets you select a default category for each supplier and customer. QuickBooks again goes one step further and not only remembers the category, but also the amount from the previous time. However, this means users may accidentally copy previous amounts rather than enter the correct ones (luckily, this feature can be turned off).

month or quarter and enter them in one go, it is important that purchases can be entered and paid in one go. MYOB and QuickBooks have the best facility for this – the user simply enters the purchase as an on-screen cheque. Pegasus also handles this well – by including a dialog box for entering purchases in which you simply tick 'Pay Now' and enter a cheque number.

With TAS, the proper way to enter an invoice that is payable immediately is to type in the purchase invoice and then open up a separate window and pay it. TAS Books Accounting is therefore more suitable for businesses paying most of their purchases on account. While the entry could be typed into TAS' cashbook as a single item, this would not keep track of the company it was

▼ **NAVIGATING MYOB BY UTILISING ITS COMMAND CENTRE**



## Purchase ledger

Accounts software should be flexible enough to cope properly both with purchases that are paid by account and those which are paid at the time of purchase. With all the programs (bar DO\$H) you can enter an invoice and the software will track it. MYOB and QuickBooks can remind you when they first load up which invoices need paying. However, for businesses that leave invoices in a file until the end of the



▲ QUICKBOOKS' NAVIGATOR, WITH A REMINDER WINDOW  
 ▼ MAKING A PAYMENT TO A SUPPLIER USING QUICKBOOKS

programs here, but transactions can take longer to enter than in the others – not a problem if you are only entering a small number at a time.

What DO\$H stops short of doing, QuickBooks promises. Its help system enthuses about the way in which transactions can be entered directly into its 'register' making data entry as simple as using Money or Quicken. Entering into the register is more reassuring because users can see what they have entered previously. This works perfectly for businesses that are not VAT registered. The only slight criticism is that Intuit has left a VAT column out of QuickBooks, so other businesses have to 'split' the category.

Businesses writing a large number of cheques will find computer-printed cheques a godsend. Instead of entering a payment into the computer and then filling out a cheque by pen, you simply enter the figures on your PC, load the blank cheques into your printer, and they get printed, with an attached remittance advice slip. MYOB, QuickBooks and TAS Books all support this feature.

Sage was not as integrated as we would have liked. For example, when adding a new product to the stock database, the drop-down list of suppliers would not let us create a new supplier. With any of the program's wizards open, access is locked off to the rest of the program, so you have to close the wizard before being able to enter the supplier.

Basic job costing is provided in all of the programs save Capital Lite, Instant Accounting and DO\$H. While Capital Lite and Instant Accounting are suitable for a service or distribution business, they are therefore not appropriate for those wishing to track costs by customer or project.

## Sales ledger

All of the products here can produce invoices both on pre-printed stationery as well as on ordinary paper (except DO\$H, which does not have invoicing facilities). Reasonable layout facilities are provided with most of the programs. The exception is Pegasus, which can only produce pre-defined layouts. TAS goes one step further, letting users design invoices with Microsoft Word, which makes it the most flexible program.

TAS, Pegasus, MYOB and the Pro version of QuickBooks are the only ones that can issue proforma invoices, so they are the only ones suitable for companies with stock – which need to invoice and receive payment before delivery. Likewise they are the only programs capable of producing estimates.

TAS Books effectively keeps only one

database, and therefore lets you have customers who are also suppliers. This makes contra entries a dream. A contra entry is a transaction where you pay off a purchase invoice by subtracting what a supplier owes separately in a sales invoice. Of course, you can do this with the other programs, but in a slightly more convoluted way.

Chasing up overdue invoices is a reason in itself for using a computerised accounts package. MYOB and QuickBooks did this in the best way by (optionally) publishing a list of reminders when the program loads. They, along with Instant Accounting, TAS and Pegasus, have facilities to track overdue items and keep a log of calls. MYOB was arguably the best at this by automatically dialling the customer through a modem and keeping an accurate log of the call.

## VAT handling

Most products sensibly assume by default that any amount you enter is inclusive of VAT. After all, many VAT-registered shops issue receipts without printing the VAT amount. No suppliers, however, issue receipts stating only the net amount. Of course, you may be quoting net amounts to your customers, or producing a purchase order when you have agreed a price excluding VAT. Ideally, therefore, the software should allow you to enter net amounts in addition to gross. TAS led the group by having fields for both net and gross amounts (it automatically calculates and displays the other as you type it in). In what Sage calls 'batch invoices' – where you enter invoices when you are not printing them in Sage – it assumes the amount in net, but does provide a button to take the VAT from a gross figure. However, if you are issuing a more detailed invoice (which Sage is to print), you have to go into a separate window

to do this conversion. Pegasus, uniquely, leaves it up to the user to

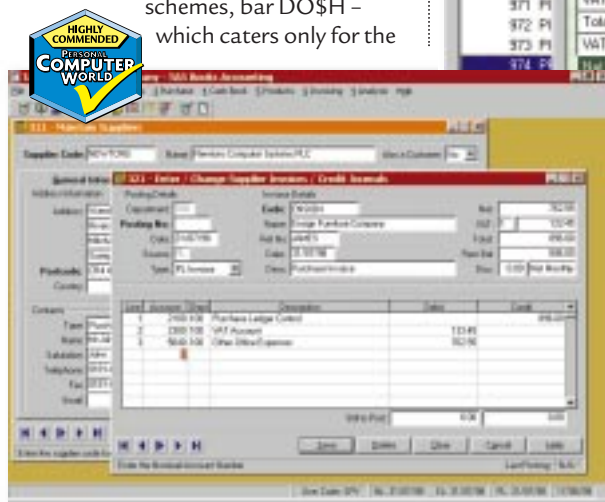
**Chasing up overdue invoices is reason enough to use these packages**

work out the excluding VAT price.

Rather surprisingly, TAS Books is the only program that asks for both a posting date and an invoice date. This means you can ensure VAT is calculated for the correct VAT quarter, while still being able to track an invoice by its date and accurately produce overdue bills. From an auditing perspective, it makes it

ideal to look back and find out what has been going on. Pegasus automatically forwards entries if they are dated after the end of the set accounting period. QuickBooks and MYOB have a feature to prevent entry before a certain date, but this makes it harder to track invoices.

Producing a VAT return in all the programs is child's play. All cater for both accrual and cash accounting schemes, bar DO\$H – which caters only for the



▲ A VAT RETURN IN SAGE, READY TO BE COPIED ONTO THE REAL FORM  
◀ ENTERING A PURCHASE INVOICE INTO TAS BOOKS ACCOUNTING

latter. All the packages will display an on-screen VAT return, ideal for copying straight on to the paper form.

## Help

QuickBooks has the best computerised help of all the products. Near to each window is a context-sensitive cue card (which can be switched off). These cards explain in detail what should be entered into each field. Each window also has a 'How do I?' button on its title bar which gives a menu of help topics QuickBooks thinks are relevant to the task in hand. The clarity of the help was particularly impressive. It was also the only program to offer help in the form of video clips. Pegasus has a balloon help system but the advice is not provided in much detail, often just one or two words. Its manual assumes reasonable knowledge of accounting and only covered installation on machines using Windows 3.1. Its tutorial disk was also disappointing, basically consisting of on-screen text (Pegasus was the only program not to have a CD-ROM version).

We were impressed both by DO\$H's handbook, which was very easy to follow, and its CD-ROM tutorial. Sage gets full marks for providing a very clear and concise manual, but online help was often not available when we needed it. TAS provides two manuals – a quick start and tutorial, and a reference manual.

Much of the former merely details what the program can do rather than how to use it, and we felt that it did not offer enough help for the first-time user. However, the manual provides a wealth of information.

## Drill down

What differentiates today's accounting software from packages of the 1980s is that users can find information on screen easily. The facility that makes this possible is called 'drill down', which lets users see an on-screen list of transactions they have altered and follow them until they get to the original entry. Because the software here is aimed at small businesses – which usually have a single person doing the accounts – it is important that mistakes can be corrected easily. Drill down lets users find the original entry and alter it easily. Pegasus is the least advanced of the programs here. A list of transactions relating to a particular supplier or customer can be viewed, but it is not possible to alter them. Users wishing to make corrections must enter extra transactions. Sage Instant Accounting allows corrections, but we could find no way to alter a transaction in the same window as it was originally entered.

Exporting information from accounts packages is important – after all, you would not want to enter the same details

about a customer both into an accounts package and a separate database. TAS and MYOB stand out here because they integrate with Microsoft Office.

## PCW DETAILS

### DO\$H CashBook

★★★★★

Price £59.99 (£51.06 ex VAT)

Contact Dosh Software 0800 026 4666

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

### BestWare MYOB

★★★★★

Price £229.13 (£195 ex VAT)

Contact BestWare 01752 201901

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

### Pegasus Capital Lite

★★★★

Price £99 (£84.26 ex VAT)

Contact Pegasus 01536 495000

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

### Intuit QuickBooks 6

★★★★★

Price QuickBooks 6 £99 (£84.26 ex VAT); QuickBooks 6 Pro, £199 (£169.36 ex VAT)

Contact Intuit 0800 585058

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

### Sage Instant Accounting

★★★★

Price £99 (£84.26 ex VAT)

Contact Sage 0191 255 3000

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

### TAS Books Accounting

★★★★★

Price £149 (£126.81 ex VAT)

Contact TAS Software

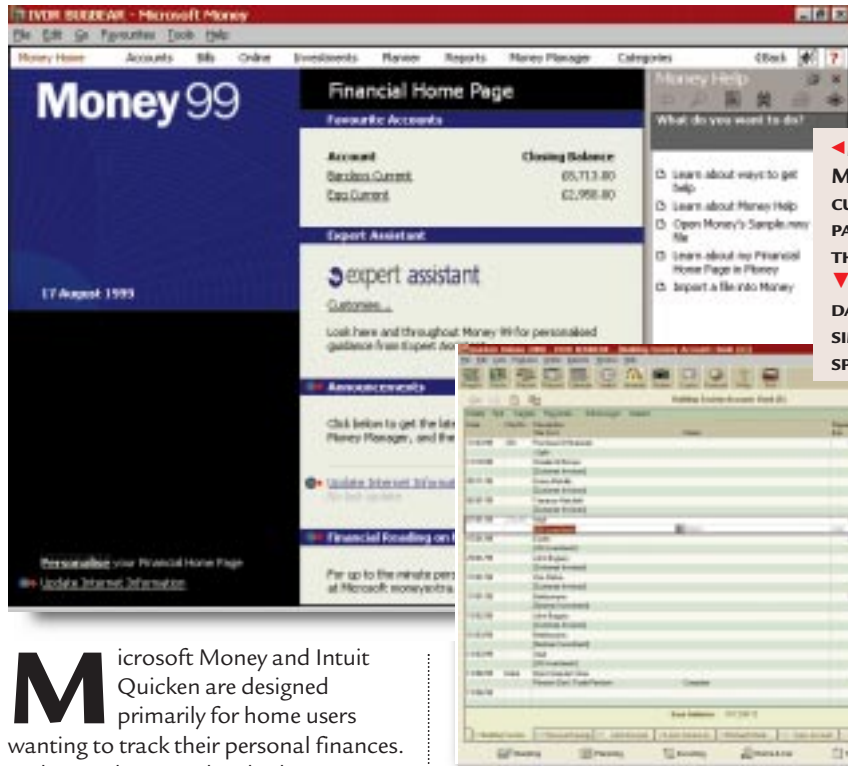
01372 727274

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



# Personal accounting packages

Designed as personal finance packages, **Money and Quicken** both claim small business adaptability.



◀ **MICROSOFT MONEY'S CUSTOMISABLE HOME PAGE SUMMARISES THE USER'S FINANCES**  
 ▼ **QUICKEN MAKES DATA ENTRY AS SIMPLE AS A SPREADSHEET**

Both programs can produce customer invoices, but unfortunately neither offers any desktop publishing facilities in the way the professional business packages do. Actually, we would not be seen dead issuing the invoices Money produced; Quicken at least lets you decide what appears on them. Quicken Deluxe can also send customer statements of account. Both packages can also print cheques, which is more than some of the business offerings can do.

For the self-employed person, the Deluxe version of Quicken comes with QuickTax, a program for producing self-assessed tax returns.

Microsoft Money and Intuit Quicken are designed primarily for home users wanting to track their personal finances. In theory, they can also do the accounts of very small businesses. This can be particularly useful for the sole trader who uses their personal bank account for both personal and business expenditure. The sole trader is unlikely to be VAT registered, and simply needs a package to track income and expenditure.

Both packages have chosen a web-based interface for viewing information about accounts. Behind this façade, the key part of each program is still the 'register' – the place where income and expenditure are entered. Both Money and Quicken could teach some of the business packages a thing or two about data entry. They are each designed more like a spreadsheet than a database. In other words, the register looks like a sheet of paper and each transaction is typed one after another down the page. This means that the last few transactions can be seen instantly.

Oddly, Microsoft has switched this off by default on its program, and (compared with Quicken) you can't see as many transactions on the page at the same time without losing important fields. However, data entry in both programs is remarkably similar. All entries can be easily modified or deleted. Transactions can be given one or more

categories, so you can find out how much you spent on separate items.

PC banking is incorporated in both products, but Microsoft is way ahead of the game, supporting eight UK banks. Intuit currently only handles NatWest, and offers no facilities for paying bills or transferring money. Microsoft Money, on the other hand, offers direct bill payment through the modem.

**Quicken is streets ahead** of Money in business features. Unlike Money, Quicken can cope with VAT, but we found its handling slightly tiresome. Quicken works out the VAT on each transaction by making you split the transaction's category between the type of purchase (such as 'stationery') and a special VAT category. This means that you can never see the category properly when looking at the register and, moreover, it makes you look at the 'Split Transaction' dialog box for every entry. It would be more productive if there was a VAT field in the register. In fact, Intuit admits in the manual that Quicken's VAT handling is something of a hassle, saying: 'If you are working with VAT on a daily basis with invoices or purchase orders, you should consider getting QuickBooks.'

Microsoft sells a competing product, but this is separate.

Despite all these features, we would be wary of recommending these programs to small-business users. They are outstanding personal accounting programs, but the business features are simply tagged on. What does the user do in Money when they want to become VAT registered? They have to learn a completely new program. Intuit, for its part, would doubtless recommend upgrading to QuickBooks. For a business requiring simply a cashbook, the less cumbersome DO\$H may still be a better option.

## PCW DETAILS

### Intuit Quicken 2000

★★★★★

**Price** £29.99 (£25.52 ex VAT),  
Deluxe version £49.99 (£42.54 ex VAT)

**Contact** Intuit 01932 578500

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

### Microsoft Money

★★★★★

**Price** £29.99 (£25.53 ex VAT), Financial  
Suite version £49.99 (£42.54 ex VAT)

**Contact** Microsoft 0345 002000

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

# Choosing the right package

Having decided what **your requirements are**, will the package be able to grow with them?

**D**ifferent users have different requirements for their accounts software. For the self-employed person who is not VAT registered, it may merely be a question of recording income and expenses so that they can fill in their tax form.

A spreadsheet could suffice for this, particularly as it may mean not having to learn an extra application. However, even packages like Money and Quicken both have advantages over the spreadsheet, automating the process and having ready-to-go reporting.

Additionally, they can link to software



to print onto self-assessment tax forms. Ultimately, it is a question of whether you want to be writing macros in Excel, or have the tools you need automatically to hand. Quicken may be a better option than Money because it can track VAT, a bonus to those who believe they may become VAT registered at a future date. That said, DO\$H's handling of VAT cash accounting is more straightforward than Quicken's and may, therefore, be a more satisfactory program if you are self-employed but also VAT registered.

For businesses

employing more than one member of staff, the suitable

programs are Sage Instant Accounting, Pegasus Capital Lite, MYOB and QuickBooks. These allow a business to track unpaid invoices and bills by computer, which is a godsend. They can also cope with accrual VAT, in addition to cash accounting.

An important issue for expanding businesses is whether they will grow out of their software. While this review looks at businesses with up to 10 employees, some programs have greater upgrade paths than others.

Sage Instant Accounting users, for example, can upgrade to Sage Line 50, and know that the learning curve will not be too tricky. TAS Books Accounting, the most feature-rich of the programs reviewed, also has a good upgrade path, as does Pegasus.

QuickBooks and MYOB, despite being aimed at the small business, can nevertheless be updated to multi-user versions.

## Year 2000 compliance

If you are unsure whether your package is **Year 2000-compliant** contact your supplier now.

**I**t is critical that an accounts package copes properly with the rollover to the Year 2000.

The key point is that any transaction you enter must be posted to the correct financial year and VAT quarter. The package must also deal competently with the entry of dates containing two-digit years, so that 98 is in the 20th century, while 01 is in the 21st century. Furthermore, any tracking (such as reminding the user about unpaid invoices) must correctly include ones from both the 21st and the 20th centuries. All of the programs reviewed here are Year 2000-compliant, and the companies can supply upgrades for non-compliant versions.

Users unsure of whether their package is Year 2000-compliant should contact their supplier immediately; most web sites give general Y2K information.

Publishers such as Pegasus are receiving hundreds of calls every month from users. Unless you have the latest version, make sure you are one of them.

Sage will replace any non-compliant

Sage program with the Y2K-compliant version free of charge, but only to those who have a SageCover support contract.

Intuit has now fully tested QuickBooks 5 and above and versions are either compliant, or a patch is being issued to users.

The company is offering users of QuickBooks 2 and 3 either a free patch or an upgrade to QuickBooks 6 at half the normal price.

TAS Software's Windows programs are compliant, but DOS users need to check that they have the latest versions.

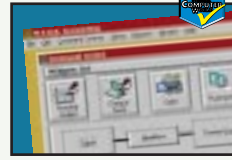
If you are using an application no longer supported, such as a DOS package or something written for, say, a



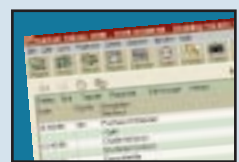
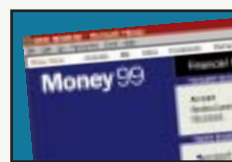
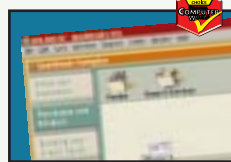
BBC Computer, it may be necessary to change to a new package.

While a chore, this may not be as daunting as it seems as it can offer an opportunity to take advantage of modern user interfaces and, for businesses that have expanded, is an ideal time to opt for something more powerful. An ideal time to have swapped would have been at the end of a business' financial year.

# Table of features

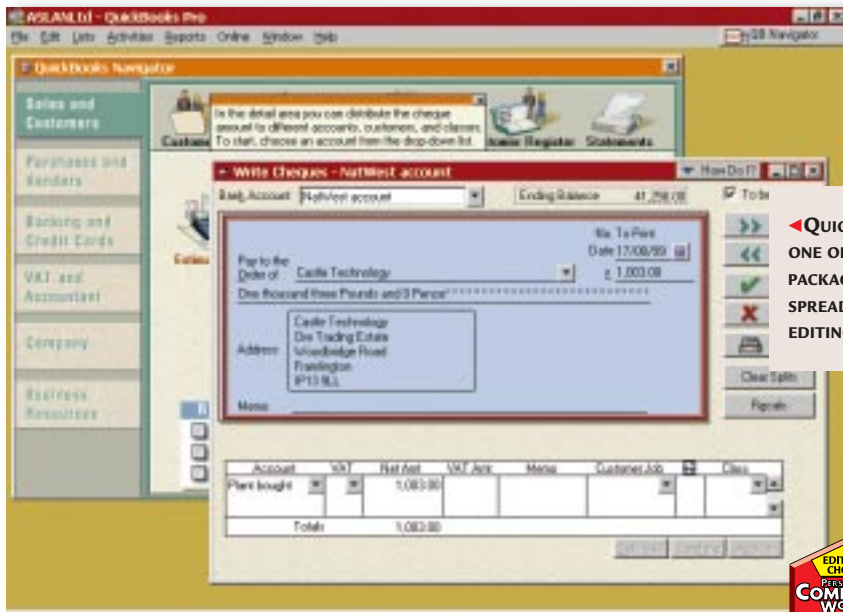


PRODUCT NAME	CAPITAL LITE	DO\$H CASHBOOK	MYOB	INSTANT ACCOUNTING
COMPANY NAME	PEGASUS	DO\$H SOFTWARE	BESTWARE	SAGE
Contact tel no	01536 495 000	0800 026 4666	01752 201 901	0800 447 777
Website address	www.pegasus.co.uk	www.dosh.co.uk	www.myob.co.uk	www.sage.com
Price inc VAT	£99	£59.99	£229.13	£99
Price ex VAT	£84.26	£51.06	£195	£84.26
Y2K compliance	✓	✓	✓	✓
Accrual VAT	✓	✗	✓	✓
VAT cash accounting	✓	✓	✓	✓
Report designer	✗	✗	✓	✓
Invoicing	✓	✗	✓	✓
Proformas/estimates	✓	✗	✓	✗
Cheque printing	✗	✗	✓	✗
Integration with MS Office	✗	✗	✓	✗
Job costing	✗	✗	✓	✗
Spreadsheet-style editing	✗	✗	✗	✗
Euro compliant	✗	✗	✗	✗
<b>EASE OF USE</b>				
Transaction entry	Fair	Good	Good	Good
Access data once entered	Poor	Good	Good	Fair
Correct errors	Poor	Good	Good	Fair
Help	Poor	Good	Good	Fair



PRODUCT NAME	QUICKBOOKS 6	TAS BOOKS	MONEY 99	QUICKEN 2000
COMPANY NAME	INTUIT	TAS SOFTWARE	MICROSOFT	INTUIT
Contact tel no	0800 585 058	01372 727 274	0345 002 000	0800 585 058
Website address	www.intuit.co.uk	www.tassoftware.co.uk	www.microsoft.com	www.intuit.co.uk
Price inc VAT	£99 (Pro £199)	£149	£29.99 (Financial Suite £49.99)	£29.99 (Deluxe £49.99)
Price ex VAT	£84.26 (Pro £169.36)	£126.81	£25.52 (Financial Suite £42.54)	£25.52 (Deluxe £42.54)
Y2K compliance	✓	✓	✓	✓
Accrual VAT	✓	✓	✓	✓
VAT cash accounting	✓	✓	✗	✓
Report designer	✓	✓	✗	✓
Invoicing	✓	✓	✗	✗
Proformas/estimates	✓ (Pro only)	✓	✓	✓
Cheque printing	✓	✓	✗	✗
Integration with MS Office	✗	✓	✓	✓
Job costing	✓	✓	✗	✗
Spreadsheet-style editing	✓	✗	✗	✗
Euro compliant	✗	✓	✓	✓
<b>EASE OF USE</b>				
Transaction entry	Good	Fair	Good	Good
Access data once entered	Good	Good	Good	Good
Correct errors	Good	Good	Good	Good
Help	Good	Fair	Good	Good

# Editor's Choice



◀ **QUICKBOOKS IS ONE OF THE FEW PACKAGES TO ALLOW SPREADSHEET-STYLE EDITING**

QuickBooks was the odd-one-out, allowing spreadsheet-style editing.

DO\$H takes a refreshing approach to businesses at the smaller end of the scale. It is not, however, as polished as many of the other programs written here,

and does not offer as much room for businesses to expand. Accounting packages, like word processors, have features that will be needed very infrequently, but it is

reassuring to know that they are there. Nevertheless, if you are confident that DO\$H will fulfil your needs, you will find it has the shallowest learning curve of any of the programs in this group test.



◀ **The first of the products** to be highly commended is TAS Books Accounting. Without doubt, it is the

most powerful package reviewed here, presenting excellent value for money. Of particular note is the clear layout of the interface. Although a relatively recent entrant into the Windows accounting market and lacking the colour of the other programs, it was very easy to navigate. It was the only program to give two dates per transaction, eliminating problems of items being posted into the wrong year or quarter – exactly how accounts software should be written.

◀ **MYOB is also highly commended.**

The whole design of the program is simplicity itself and is provided with decent manuals. Where we have watched new users start with MYOB, they have taken to it like ducks to water.

◀ **The Editor's Choice award** goes to QuickBooks, which is the easiest of all the programs here

bar DO\$H. Particularly exciting was the unrivalled help it offered. Accounting software

can be a chore to learn, but QuickBooks does the most to help. At the same time, it has the most logical data entry and eliminates repetitive entry by remembering previous transactions.

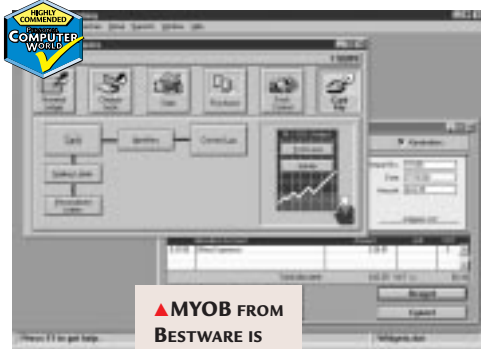
**A**ccounting software has come a long way. With only one exception the programs in this group test let users find out information on screen, drill down to the original entry and correct mistakes. A common criticism of GUIs (graphical user interfaces) is that data entry is slower. This is not so important in the small business sector, where a key concern is working out how to use the package in the first place. This is something that GUIs are great at. In the main, these programs make a good compromise.

◀ **Small business users** tend to be neither trained accountants nor willing to spend money on training courses. They buy mail order or on the high street, rather than through a specialist dealer or consultant. It is, therefore, essential that the software they use can be operated out of the box. PCW's view on Sage Instant Accounting and Pegasus Capital Lite remains that they have been designed as scaled-down versions of higher-end packages. The result is that they do not offer the same ease of use that the others exhibit. That

is not to say that they are poor products, but they do not cater for the inexperienced user to the same degree as the others in this group test. In particular, it was less easy to look at past transactions and trickier to make corrections.

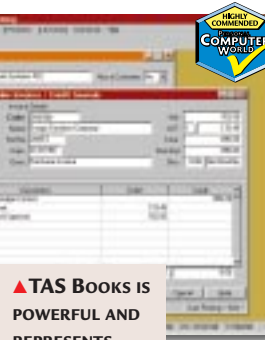
A key concern for the small business considering swapping to a computer from a paper system is how accurately the software emulates the paper-based

system. Quicken and Microsoft Money, which are aimed at the home market, would be ideal if they also offered the power most small businesses require. Out of the business products, few go far enough. Most let users see transactions on the equivalent of a sheet of paper, but require editing in dialog boxes.



▲ **MYOB FROM BESTWARE IS SIMPLICITY ITSELF TO USE**

▲ **TAS BOOKS IS POWERFUL AND REPRESENTS VALUE FOR MONEY**



# School for scanners

Faced with such a bewildering array of the now popular **flatbed USB scanners**, PCW felt it was high time to put the best to a test.

A flatbed scanner could be one of the most valuable purchases you make. Digital imagery is becoming increasingly common, but for many of us the world of paper-based products is all too real.

A scanner can be used to bridge the gap between paper and digital images. From scanning photos and emailing them to your friends, to using OCR software to scan in text for editing on your word processor, the scanner is there to help. Until recently the most common methods of connecting a scanner to a PC

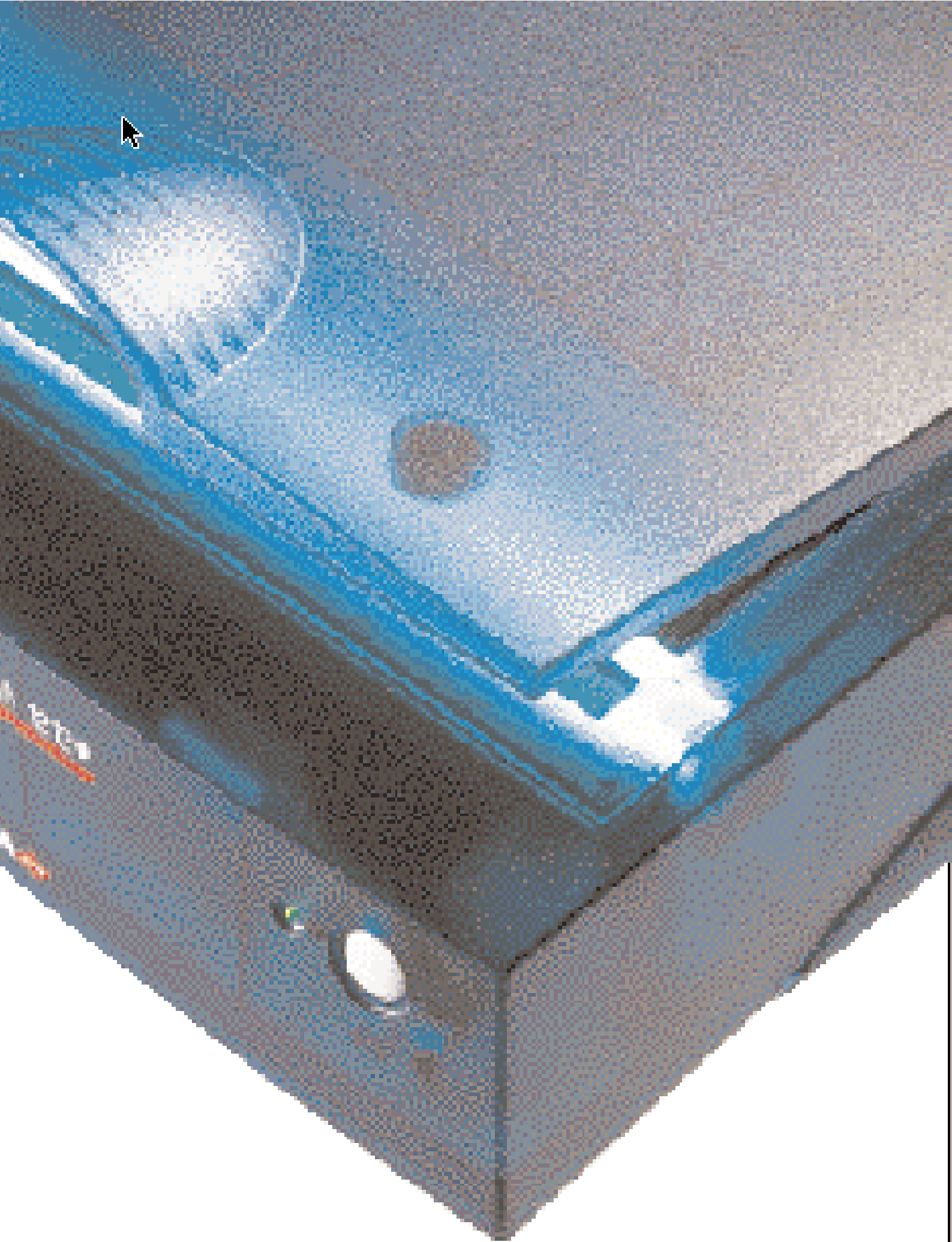
were either through the parallel port or by putting a SCSI card into your machine. The popularity of the USB port, however, means that there is an increasingly large number of USB scanners appearing on the market, making what used to be a tricky task far easier to set up and use than ever before.

But, faced with such a bewildering array, which one do you buy? PCW took a look at 12 flatbed USB scanners and put them through their paces. So, if you're looking for your first step into image capturing, read on...

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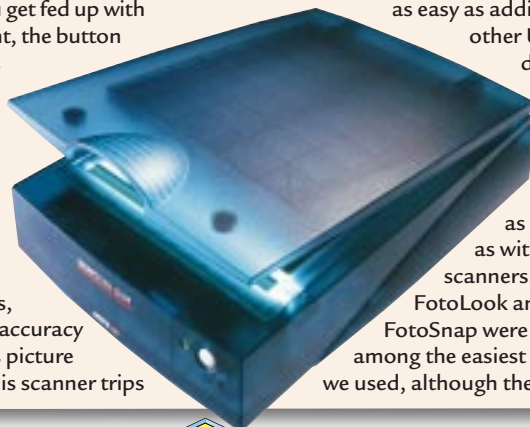
• Tested and reviewed by Jason Jenkins



### Agfa Snapscan 1212U

The most striking thing about the Agfa is its design. The transparent green plastic case means that you can see the light as it works its way over your target. If you get fed up with looking at the light, the button on the front turns it off until the software wakes it up again. The Agfa can handle thick media.

The scanner was not a consistent high scorer in our tests, however. Colour accuracy is very good, as is picture quality. Where this scanner trips



up, though, is in the time it takes to scan each target: it was one of the slowest here. Resolution of text is not all it could have been either. Set-up is as easy as adding any other USB

device. The software bundle is good, but not as generous as with other scanners.

FotoLook and FotoSnap were not among the easiest programs we used, although they do

possess all the functionality of the competing utilities.

Overall, the SnapScan provides style over content, it looks good but is eclipsed by better all-round performers.

#### PCW DETAILS

★★★★★

**Price** £120 (£102.13 ex VAT)

**Contact** 0181 231 4903

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

**Good Points** *Lovely design*

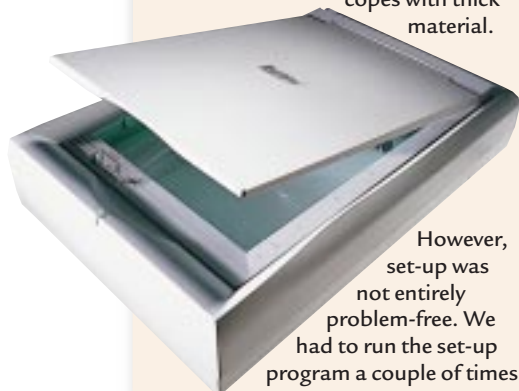
**Bad Points** *Software supplied could be better*

**Conclusion** *A good scanner but not as good as the Epson*

### Black Widow 9636 USB



Scotland-based Black Widow has put a lot of effort into its build quality. The 9636 USB looks and feels substantial with a lid that easily copes with thick material.



However, set-up was not entirely problem-free. We had to run the set-up program a couple of times

to install all the necessary drivers and bundled software, but this wasn't a major issue. The program installs all the necessary drivers for you, rather than forcing you to browse around the CD. The TWAIN driver is easy to use, with options readily available for changing advanced settings.

A batchscan feature allows you to scan several individual target areas in one operation, and the program also suggests the resolution it thinks is appropriate for the scan target.

Black Widow's 9636 did well in our tests, especially considering its lower price. Colour accuracy and fast scanning were its main strengths.

The software bundle is as generous as any of the other scanners

here, with the Presto! bundle including an image manipulation and OCR program. The only thing missing is a one-touch scan button, but it gives impressive performance at a great price.

#### PCW DETAILS

★★★★★★

**Price** £89 (£75.74 ex VAT)

**Contact** 01324 825 999

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

**Good points** *Good build quality at the price*

**Bad points** *No one-touch scan button*

**Conclusion** *Great value coupled with decent quality*

### Canon Canoscan FB620U

This scanner has Canon's patented LED Indirect Exposure (LIDE) technology, using three-colour LEDs as the light source as opposed to a white fluorescent lamp. This makes the scanner very thin and light.

Unfortunately, the lid isn't double-hinged for thicker targets, it simply rests on the media at an angle.

A button on the front brings up a menu where you can select the program you want the scan to go to. Canon provides a program, the Scangear Toolbox, that enables you to send the target to an email program, a printer, a fax or a file.



Installation was painless, and the bundled software package is more than adequate.

LIDE technology is designed to improve performance, but this model did not perform well. Our scanner made a disconcerting high-pitched whining noise when

operating and

was one of the slower models we

tested. The Charge-Coupled

Device returns to its original position at the

same speed as it scans. Colour accuracy was not good overall; neither was picture quality. It did best on the reproduction of text. On the whole, the performance of the Canoscan was disappointing.

#### PCW DETAILS

★★

**Price** £139.83 (£119 ex VAT)

**Contact** 0121 680 8062

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

**Good points** *Easy output direction.*

**Bad points** *Slow scan speed, lid could have been designed better*

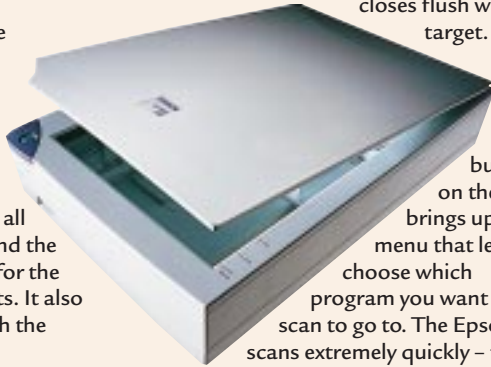
**Conclusion** *A disappointing offering from a well-respected company*

## Epson GT-7000 USB



This scanner is truly a joy to use. Installation is simplicity itself. The add new hardware wizard installs the drivers, and a program on the CD-ROM installs the software suite effortlessly.

The bundled software provides all the image manipulation and OCR options that most users will need. The TWAIN software has been excellently designed and is very user-friendly, with all settings clearly flagged and the default settings suitable for the most popular scan targets. It also integrates seamlessly with the bundled applications.



Build quality is excellent: the GT-7000 USB looks and feels as though it is worth the entire purchase price.

The cover is hinged so that it can handle thicker media easily and closes flush with the target. A

button on the front brings up a menu that lets you choose which program you want the scan to go to. The Epson scans extremely quickly – the

fastest of all the scanners in the test. Although it does not occupy first position in our quality tests, it is consistently near the top, with very good reproduction of text as well as graphics. An excellent piece of machinery that's worth the money.

### PCW DETAILS



**Price** £179 (£152.34 ex VAT)

**Contact** 0800 220 546

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

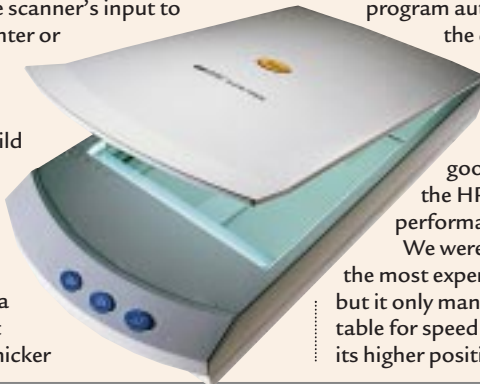
**Good points** Great performance and excellent build quality

**Bad points** None to speak of

**Conclusion** A fantastic all-rounder

## Hewlett-Packard ScanJet 4200C

Despite its good looks and easy-to-use software, the HP was something of a disappointment overall. The front of the unit is equipped with three buttons that enable you to deliver the scanner's input to email, printer or imaging software with one touch. Build quality is good, with the chassis feeling solid and a cover that handles thicker



media. Annoyingly, however, the lid would not stay open unless held.

The HP software was extremely easy to use, with each scan split into three clear steps to follow. The program automatically selected the correct area to scan on each of our tests, and suggested a setting for each target.

Despite all of these good points, however, the HP did not excel in our performance tests.

We were expecting more from the most expensive model on show, but it only managed a place mid-table for speed and colour accuracy – its higher position on picture quality

could not make up for coming last in text reproduction.

The ScanJet has commendable features, but we were disappointed with its overall performance.

### PCW DETAILS



**Price** £159.80 (£136 ex VAT)

**Contact** 0990 47 47 47

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

**Good points** One-touch button, easy-to-use software

**Bad points** Didn't do well in speed or quality stakes

**Conclusion** A disappointing unit from a big name in the imaging business.

## Microtek Phantom C6

The best thing about this scanner is its slim dimensions – only 43mm thick. Build quality could be better; our main niggle was that the target kept getting caught between the plastic surround and the glass.

There is no arrow to tell you where to place the target, and the lid does not hinge up to accommodate thicker media. The Microtek Phantom C6 is supplied with the same CD as the X6, and so the same installation problems were experienced. The black (as opposed to the



more common white) underside of the lid helps the TWAIN driver to correctly select the area to be scanned, meaning that you spend less time setting up the scan by manually selecting the image.

The case has a shortcut button that brings up Microtek's ScanWizard. This is a useful program where you can choose from a series of pre-defined options or go straight into the standard screen where you can manually configure your scanner. The C6 falls down badly

on speed – it was the slowest on test. It did manage to score some points with the remaining tests, however, particularly in the picture quality tests. But this wasn't enough to raise the C6 above mediocrity.

### PCW DETAILS



**Price** £92.83 (£79 ex VAT)

**Contact** 01908 317 797

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

**Good points** Very slim

**Bad points** Build quality could be better

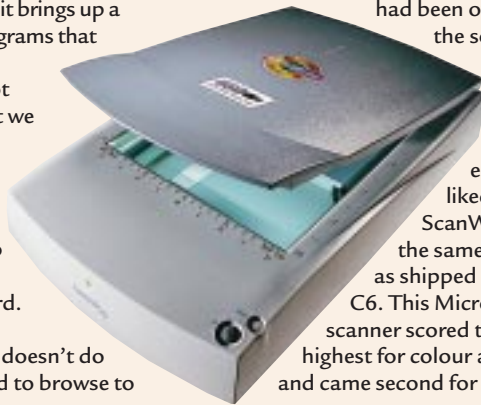
**Conclusion** Outclassed by the competition



### Microtek ScanMaker X6

The ScanMaker X6 exhibited impressive build quality, with a cover that lifted easily to cope with our hefty magazine. When the one-touch button on the front is pressed, it brings up a menu of registered programs that you can scan to.

Installation was not among the easiest that we experienced. After installing the driver through the Windows Wizard, the program asks you if you want to install the TWAIN-compatible ScanWizard. When you select 'yes', however, the program doesn't do this for you and we had to browse to



the correct folder and find the set-up program manually. This is likely to be even more confusing for less experienced users. Once this hurdle had been overcome, the software was very user-friendly. We especially liked the ScanWizard, the same program as shipped with the C6. This Microtek scanner scored the highest for colour accuracy and came second for speed.

Performance on our text and picture quality tests just stopped it from coming out top, although this was far from dreadful. Ultimately, the X6 is worth a look.

### PCW DETAILS

★★★★

**Price** £139.83 (£119 ex VAT)**Contact** 01908 317 797[www.microtek.com](http://www.microtek.com)**Good points** Good build quality and test scores**Bad points** Slightly problematic installation**Conclusion** A good scanner that just misses out on an award

### Mustek ScanExpress 600CU

The cheapest scanner on test is not one of the best. Build quality, as you might expect at this price, is not very impressive. The most striking



thing about it is that it has a captive USB

cable. This is a strange decision from Mustek as it means that should a fault develop with the cable, the entire unit has to go back to the factory. The lid also doesn't lift for thicker scan targets.

Installation was fairly problem-free; Mustek has written an installation program that bypasses the add-new-hardware wizard and installs everything for you. The TWAIN driver did not install on the first attempt but re-running the installation program solved this problem. Mustek has also written a program that sits in your system tray and detects when the cover has been lifted, bringing up a menu requesting which program you want the scan to

go to. This essentially performs the same function as the one-touch buttons on some of the other models. If you find this irritating, as we did, you can easily remove it from your start-up folder.

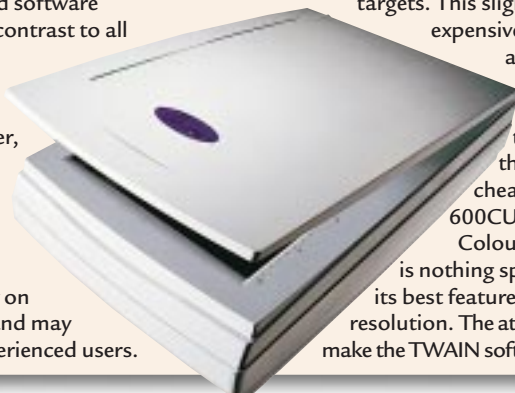
### PCW DETAILS

★★★

**Price** £59.99 (£51.05 ex VAT)**Contact** 0870 013 2017[www.mustek-europe.com](http://www.mustek-europe.com)**Good points** The cheapest here**Bad points** Captive USB cable, disappointing performance**Conclusion** One to avoid despite its low price

### Mustek ScanExpress 1200 USB

Mustek's higher-end scanner is unexciting, and was placed mid-table in most of our performance tests. Installation is easy – Mustek has written its own program to install the driver and bundled software automatically. In contrast to all of the other manufacturers' installation programs, however, this does not ask you if you want to install each of the individual applications. This cuts down slightly on installation time and may appeal to less experienced users.



However, more advanced users may be put off by having less choice of what gets put on their hard disk.

In common with the 600CU, the lid doesn't accommodate fatter targets. This slightly more expensive version actually takes more time to scan than the cheaper 600CU. Colour accuracy is nothing special and its best feature is text resolution. The attempt to make the TWAIN software more

user-friendly has proven counter-productive as it takes more time to change some of the advanced settings than in other programs. Overall, the Mustek is eclipsed by rivals.

### PCW DETAILS

★★★★

**Price** £69.99 (£59.57 ex VAT)**Contact** 0870 013 2017[www.mustek-europe.com](http://www.mustek-europe.com)**Good points** Good text resolution**Bad points** Slow scan speed and mediocre image quality**Conclusion** An average scanner that can't compete in this company

## Primax Colorado USB 9600

The cheaper of the two Primax scanners actually fared slightly better in our performance tests than its more expensive cousin. Despite this, however, it failed to impress us.

Build quality was good, with a lid that accommodated our magazine. Mounted on the chassis is a 'go' button, offering faster scanning straight to your email, fax, printer or image program. Installation went without a hitch, but problems did arise with the bundled software. An attempt had been made to make



it more user-friendly by using a highly graphical interface that broke the scan settings down into stages. This is fine for the novice, but more advanced users may find the increased time it takes to get the scan set up and running frustrating. One of the final stages involves choosing where the scan will go. We wanted to save it to our hard drive, but the program refused to save it in the

folder we selected, dumping it in the root instead. The Colorado 9600 was fairly fast, coming fourth in our speed tests. For the money, it looks attractive, but the superior Black Widow costs £10 less.

### PCW DETAILS

★★★★

**Price** £99 (£84.26 ex VAT)

**Contact** 01235 546 020

[www.primax.nl](http://www.primax.nl)

**Good points** One-touch scan button

**Bad points** Let down by disappointing performance

**Conclusion** An average unit that's eclipsed by the better models on test

## Primax Colorado USB 19200

The more expensive of the two Primax scanners has a higher optical resolution than its cheaper sibling, but this did not have a significant impact on our performance results.

Primax ships the same CD with

### PCW DETAILS

★

**Price** £119 (£101.28 ex VAT)

**Contact** 01235 546 020

[www.primax.nl](http://www.primax.nl)

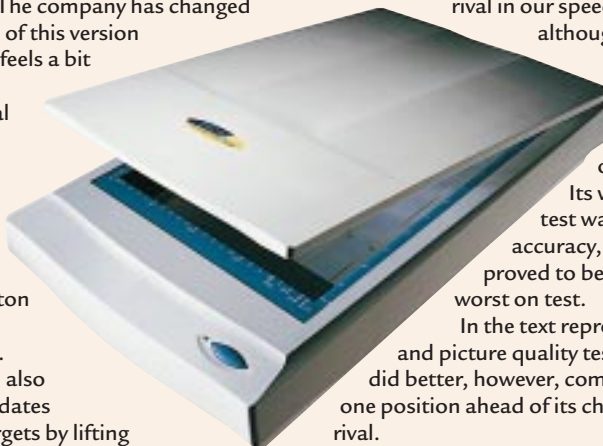
**Good points** A lid that adjusts to accommodate thicker media

**Bad points** Poor test results

**Conclusion** With cheaper and better alternatives, the 19200 is best avoided

both scanners, and we encountered similar problems with the software supplied. The company has changed the design of this version slightly: it feels a bit more substantial than the Primax Colorado USB 9600 and the one-touch button is more accessible.

The lid also accommodates thicker targets by lifting



to completely cover our magazine.

It was slower than its cheaper rival in our speed test, although it

was not one of the slowest overall.

Its worst test was colour accuracy, where it proved to be the worst on test.

In the text reproduction and picture quality tests it did better, however, coming one position ahead of its cheaper rival.

## Umax 2000USB

Umax has a reputation for making good scanners, which is why we found this model to be something of a disappointment.

Set-up was easy – a program on the installation CD-ROM guides you through the various stages and



installs the appropriate drivers for you. The lid is fixed and rests on thicker media at an angle, rather than lying flush over the top. This does not make for the best image quality on this type of scan, and means that you physically have to press the target against the glass in order to get uniform exposure. This scanner excelled in one test, reproduction of text, but fell down on scan speed, being the second slowest scanner on test. The TWAIN software displays a time-consuming 'warming up' message after you click to scan the target, which accounts for approximately one-third of the scan time. Colour accuracy is reasonable

but not overly impressive, as is picture quality. The software bundle is good, with VistaScan! allowing you to choose where you want the output to go – to a file, an imaging program, a printer, a fax or an imaging program.

### PCW DETAILS

★★★★

**Price** £104.58 (£89 ex VAT)

**Contact** 01344 871 329

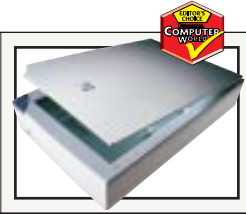
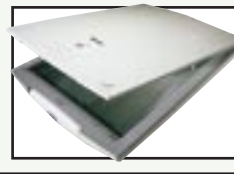
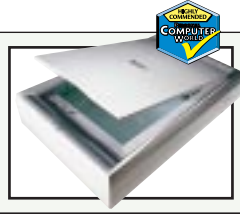
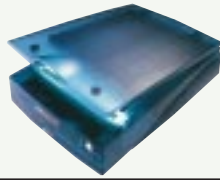
[www.umax-europe.com](http://www.umax-europe.com)

**Good points** Easy to set up

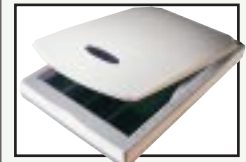
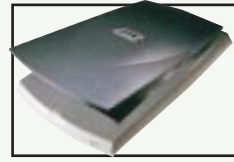
**Bad points** Slow scan speed

**Conclusion** A decent unit, but we expected more from Umax

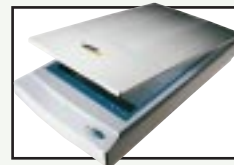
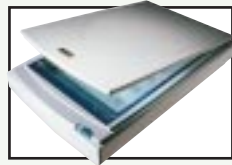
# Table of features



MANUFACTURER	AGFA	BLACK WIDOW	CANON	EPSON
MODEL	SNAPSCAN 1212U	9636 USB	CANOSCAN FB620U	GT-7000 USB
Highest optical resolution	600dpi	600dpi	600dpi	600dpi
Highest interpolated resolution	9,600dpi	9,600dpi	2,400dpi	9600dpi
Colour depth	36bit	36bit	36bit	36bit
Max scanning area	A4	A4	A4	A4
Software	Page Keeper Caere Omnipage Scanwise	Presto! Suite	Ulead PhotoExpress 2.0 Caere's OmniPage LE 5.1 ScanGear Toolbox CS 2.0	Adobe Pagemill 3 Xerox Textbridge Classic Presto Page manager
Transparency option	X	X	X	✓
Dimensions (mm)	435 x 275 x 90	451 x 308 x 96	372 x 256 x 63	425 x 287 x 88
Price inc VAT (ex VAT)	£120 (£102.13)	£89 (75.74)	£139.83 (£119)	£179 (£152.34)
Contact	0181 231 4903	01324 825 999	0121 680 8062	0800 220 546
Web	www.agfa.co.uk	www.blackwidow.co.uk	www.canon.co.uk	www.epson.co.uk



MANUFACTURER	HEWLETT-PACKARD	MICROTEK	MICROTEK	MUSTEK
MODEL	SCANJET 4200C	SCANMAKER X6	PHANTOM C6	SCANEXPRESS 600CU
Highest optical resolution	600dpi	600dpi	600dpi	300dpi
Highest interpolated resolution	9,600dpi	9,600dpi	9,600dpi	9,600dpi
Colour depth	36bit	36bit	36bit	36bit
Max scanning area	A4	A4	A4	A4
Software	Adobe Photodeluxe 3 HP Precision Scan HP colour copy utility	Adobe Photodeluxe Ulead Photoimpact	Adobe Photodeluxe Ulead Photoimpact	Photoexpress 2 Textbridge Pro 8
Transparency option	X	✓	X	X
Dimensions (mm)	454 x 206 x 93	440 x 292 x 81	437 x 290 x 43	404 x 257 x 130
Price inc VAT (ex VAT)	£159.80 (£136)	£139.83 (£119)	£92.83 (£79)	£59.99 (£51.05)
Contact	0990 47 47 47	01908 317 797	01908 317 797	0870 013 2017
Web	www.hp.com/uk	www.microtek.com	www.microtek.com	www.mustek-europe.com



MANUFACTURER	MUSTEK	PRIMAX	PRIMAX	UMAX
MODEL	SCANEXPRESS 1200 USB	COLORADO USB 9600	COLORADO USB 19200	2000USB
Highest optical resolution	600dpi	300dpi	600dpi	600dpi
Highest interpolated resolution	19,200dpi	9,600dpi	19,200dpi	9,600dpi
Colour depth	36bit	36bit	36bit	36bit
Max. scanning area	A4	A4	A4	A4
Software	Photoexpress 2 Textbridge Pro 8	MGI Photouite 8.06 PrimaPAGE 98	MGI Photouite 8.06 PrimaPAGE 98	Adobe PhotoDeluxe PrestoPageManager OmniPage LE
Transparency option	✓	X	X	X
Dimensions (mm)	470 x 308 x 102	435 x 285 x 82	480 x 280 x 85	467 x 309 x 99
Price inc VAT (ex VAT)	£69.99 (£59.57)	£99 (£84.26)	£119 (£101.28)	£104.58 (£89)
Contact	0870 013 2017	01235 546 020	01235 546 020	01344 871 329
Web	www.mustek-europe.com	www.primax.nl	www.primax.nl	www.umax.co.uk

# PCW Labs Report



## COLOUR ACCURACY RANKING

1	MICROTEK SCANMAKER X6
2	AGFA SNAPSCAN 1212U
3	BLACK WIDOW 9636 USB
3	EPSON GT-7000 USB
5	MICROTEK PHANTOM C6
6	UMAX 2000USB
7	MUSTEK SCANEXPRESS 1200 USB
7	HP SCANJET 4200C
9	MUSTEK SCANEXPRESS 600CU
10	PRIMAX COLORADO USB 9600
11	CANON CANOSCAN FB620U
12	PRIMAX COLORADO USB 19200

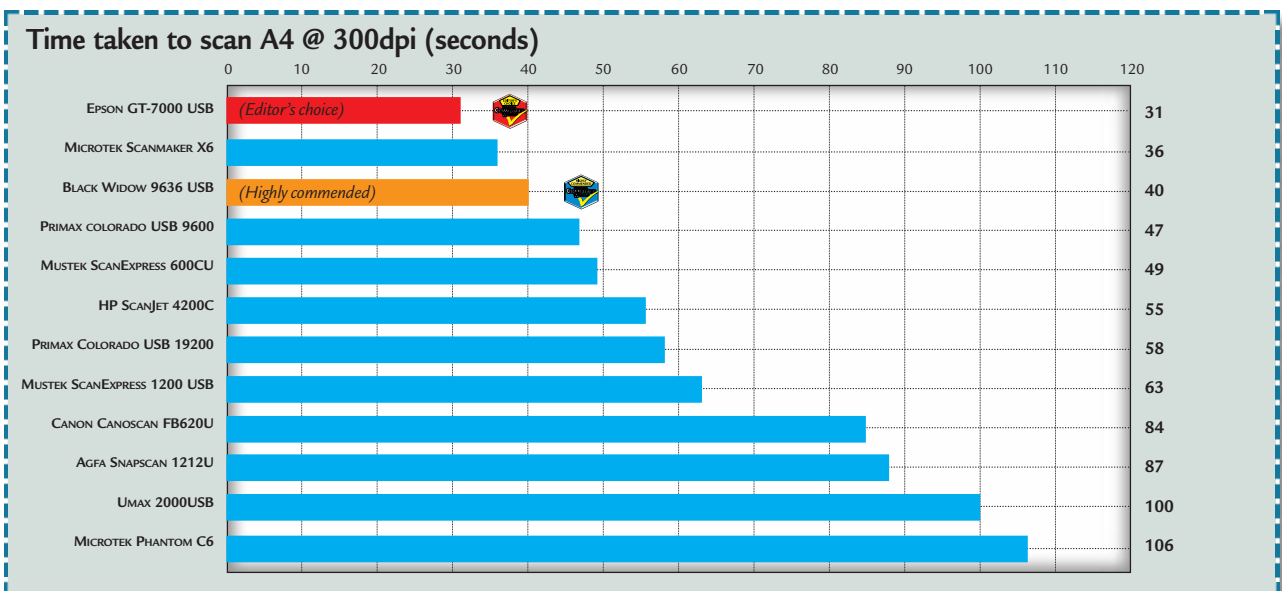
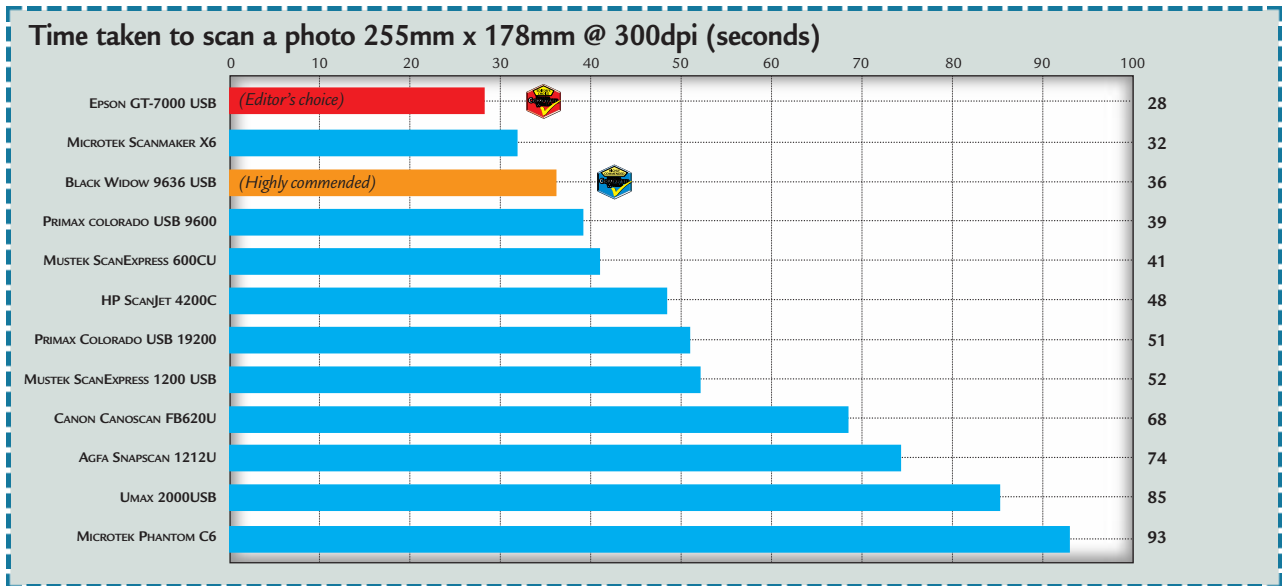
## TEXT QUALITY RANKING

1	UMAX 2000USB
2	EPSON GT-7000 USB
3	CANON CANOSCAN FB620U
4	MUSTEK SCANEXPRESS 1200 USB
5	MICROTEK SCANMAKER X6
6	MICROTEK PHANTOM C6
7	BLACK WIDOW 9636 USB
8	AGFA SNAPSCAN 1212U
9	PRIMAX COLORADO USB 19200
10	PRIMAX COLORADO USB 9600
11	MUSTEK SCANEXPRESS 600CU
12	HP SCANJET 4200C

## PICTURE QUALITY RANKING

1	AGFA SNAPSCAN 1212U
2	EPSON GT-7000 USB
3	HP SCANJET 4200C
4	BLACK WIDOW 9636 USB
5	MICROTEK PHANTOM C6
6	MICROTEK SCANMAKER X6
7	CANON CANOSCAN FB620U
8	UMAX 2000USB
9	PRIMAX COLORADO USB 19200
10	PRIMAX COLORADO USB 9600
11	MUSTEK SCANEXPRESS 1200 USB
12	MUSTEK SCANEXPRESS 600CU

For all results 1 = best performer in category



# Editor's Choice

PC peripherals have generally fallen dramatically in price over the last few years, and scanners are no exception. Technological and production improvements have meant that you now get a much higher quality scan for your money, and USB connectivity makes installation easy, even for the PC novice. Given the

restarting the system. When evaluating these units we didn't just look at our test results, but considered them in addition to other factors such as ease of installation, how easy the TWAIN software was to use, the quality of the bundled software and, of course,

the price. Most of the manufacturers appeared to have done their homework and have designed the TWAIN software extremely well, making it very easy for the novice to use, while allowing the more advanced user to change the more detailed options.

offers superb build quality and a great software package, helping it rise above its peers to win the award.

➔ **The highly commended award** goes to the Black Widow 9636 USB. A strong performer in our tests overall (equalling the Epson on colour accuracy), this unit features very easy to use software, together with the added functionality of a batch scan feature to complement its high quality. Black Widow has put a lot of thought into the design; it certainly does not suffer from the flimsy feel that afflicted some of the other models, and the lid coped with our thick magazine easily, with the hinge lifting to close flush on top of it. But most impressive is the price, making it attractive in every respect.



▲ **EPSON'S GT-7000 USB** WAS THE MOST CONSISTENT PERFORMER IN THE TESTS

low price, we were generally impressed by most of the scanners here, with many producing results that would be more than acceptable to the average user. Although we did encounter a few installation problems, most of them were simply annoying quirks that could easily be overcome by most users. Once the drivers were loaded, all the scanners were true plug-and-play and could be connected and disconnected without

➔ **The Editor's Choice award** this month goes to the Epson GT-7000 USB. As our results show, it was the most consistent performer in the tests, with fast scan times, good colour accuracy, excellent text reproduction and picture quality. This is one of the more expensive scanners, but we feel that compared to the others here, the performance and build quality justifies the extra cost. The Epson

▲ **THE BLACK WIDOW 9636 USB:** STRONG PERFORMER AT A VERY ATTRACTIVE PRICE

## How we did the tests



**To put the scanners through their paces** we scanned in three images at 300dpi – a special test target from HP with a mixture of different colours and text on it, a very high-quality photo and the September 1999 cover of PCW. We chose 300dpi as the test resolution since it was the highest optical resolution that all of the scanners could manage, thus guaranteeing a level playing field. None of the default settings were changed, bar the resolution, in order to maintain out-of-the-box testing. The time taken to scan each image was recorded. We then sent the HP target off to a

professional imaging bureau that provided us with a reference image using a high-quality drum scanner. To check the colour accuracy we employed Adobe PhotoShop to compare the cyan, magenta and yellow levels present in each of the relevant samples on the HP scan target with the drum scan and rated the scanners in order of one to 12.

Finally, we judged the quality of text and photo resolution from each of the 12 scanners, again rating them from one to 12. The same machine was used for all the scanners with all of the previous drivers removed before a new scanner was set up.



# On display

Although the lifespan of most components is annoyingly short, a good monitor can outlast two or more PCs. But if you're now in need of a new **17in or 19in CRT display** then read on...

**W**ith so much attention given to the components that lurk inside a PC, one of the most important parts of the system is often overlooked.

The monitor is of paramount importance to the PC user, it's a window through which everything is viewed. Consequently, if a poor monitor is married up with a high-specification system, it is liable to ruin the overall effect.

In addition, even though the lifespan of most PC components is very short, the life expectancy of a monitor can be several years. A good monitor, therefore, can outlast two or even three PCs.

Even though monitor technology

doesn't move very fast, it does move, and all the units on test use the latest super-flat CRT technology to provide the best possible image quality.

To test each of the units we connected them to a Matrox Millennium G400 graphics card, running at a resolution of 1,024 x 768.

DisplayMate for Windows from Sonera Technologies was used to test the image quality of each monitor. DisplayMate includes over 100 test images that highlight display problems such as focus, geometry and colour registration.

So, if you're looking for a 17in or 19in display, cast your eye over six of the latest and greatest CRT monitors available.

## Contents

- 204** Iiyama Vision Master Pro 410  
LG Flatron 795FT Plus
- 207** Mitsubishi DiamondPro 710  
Samsung Syncmaster 700IFT
- 208** Sony GDM-F400T9  
Taxan Ergovision 980
- 213** **Editor's Choice**

• Tested and reviewed by Riyad Emeran

## Ratings

- ★★★★★ **Highly recommended**
- ★★★★ **Great buy**
- ★★★ **Good buy**
- ★★ **Shop around**
- ★ **Not recommended**

## Iiyama Vision Master Pro 410

We were expecting Iiyama's top of the range 17in unit to continue the tradition of high-quality monitors. Unfortunately, this latest display showed severe power regulation problems. If a window with a lot of white space is opened, the entire screen contracts, it then expands again once the window is closed. Of course power regulation isn't the worst problem that a monitor can suffer from, and the Vision Master Pro 410 still has a lot going for it.

The tube is a Mitsubishi 17in Natural Flat model, so it is very flat



and shows little sign of reflection. Being an aperture grille tube, the two damping wires are evident at corresponding distances from the top and bottom of the display.

Horizontal colour registration was as near to perfect as you're likely to see, but vertical colour registration was slightly out.

Bizarrely, however, there was only a control to adjust horizontal colour convergence so this problem could not be rectified.

The look of the monitor is the same as all Iiyama designs. The lines are clean and the fascia is uncluttered, adorned by only three buttons. Unfortunately, this minimal effect leaves the user with a convoluted, nested menu system in the OSD. Even though many of the controls will not need to be accessed once the monitor is set up, a more friendly approach would have been better.

At the rear of the unit all the connectors are well recessed making it easy to place the monitor in any position. There are BNC and

D-SUB connectors, but you'll have to navigate the OSD to switch between them.

**Image quality is sharp** and well focused and the price is attractive, but you'll have to see past the power regulation problem and poor OSD to appreciate the good points.

### PCW DETAILS

**Price** £316.07 (£269 ex VAT)

**Contact** Iiyama

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

**Good points** Very flat screen, good value.

**Bad points** Very bad power regulation.

**Conclusion** A good, but slightly flawed 17in monitor at a reasonable price.

<b>Image Quality</b>	★★★★
<b>Features</b>	★★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

## LG Flatron 795FT Plus

There was a time when LG monitors were considered the budget alternative. Now, however, the Korea-based company produces some first-rate displays. This super flat tube design was actually developed by Zenith, but LG bought the idea and marketed it as the Flatron range. The Flatron is based on the aperture grille tube approach, but it doesn't need the two damping wires that put some potential buyers off the technology. The screen is very flat, almost to the point that it looks concave. This is because the



Flatron design uses completely flat glass for both of the CRT surfaces, whereas the FD and NF designs have a slight curve on the internal surface to offset the diffraction.

This is one of the best looking monitors we've seen. The bezel is thin enough not to detract from the screen and the fascia is uncluttered. The OSD is controlled by six touch-sensitive buttons that enhance, rather than ruin, the unit's appearance. There's also an impressive array of controls, including an adjustment for colour purity.

Surprisingly, there are no BNC connectors at the rear, but there is a USB hub. Image quality was good, but not outstanding. The Flatron had some problems with vertical colour registration that couldn't be corrected using the colour convergence adjustments. It also had trouble in the power regulation department, although this won't cause a major problem for most users. You can push the Flatron up to 1,600 x 1,200 and still receive an

acceptable 75Hz refresh rate. Although 1,024 x 768 will probably be the resolution of choice, where it will easily manage 85Hz.

**LG can't quite compete** with the tubes that Sony and Mitsubishi have to offer, and at £290 ex VAT it's not the cheapest on test either.

### PCW DETAILS

**Price** £340.75 (£290 ex VAT)

**Contact** LG 0870 6075544

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

**Good points** Excellent OSD controls.

**Bad points** No BNC connectors.

**Conclusion** Bright, vibrant colours and no damping wires, but a bit pricey.

<b>Image Quality</b>	★★★★
<b>Features</b>	★★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

## Mitsubishi Diamond Pro 710

**Like the Iiyama Vision Master Pro 410**, the Mitsubishi Diamond Pro 710 uses a 17in Natural Flat tube. Just like the Iiyama, the image is sharp and well focused, while the colours are bright and vibrant. Unfortunately though, the Diamond Pro 710 also suffers from power regulation problems, although nowhere near as bad as the Iiyama.

However, the Diamond Pro 710 has a few other problems. One of the major issues is the captive video cable. With the cable hard-wired



into the monitor, you'll have to send the whole unit back if the cable develops a problem. There's also a resultant lack of BNC connectors, so you can't connect two machines to the monitor and switch between them. Even though the LG also lacked BNC connectors, it still had a built-in USB hub, something that's also missing from this display.

The front fascia is adorned with a power button and five adjustment buttons. The OSD isn't what you'd call intuitive but it's adequate once you get used to it. One of the buttons is labelled FPM (Fine Picture Mode).

Turning FPM on allegedly improves camera-type image renderings, although all it seemed to do was decrease the image intensity when activated.

Horizontal colour registration is fairly good, but on the vertical scale it left a lot to be desired. This problem was amplified by a complete lack of colour convergence controls in the OSD.

However, the Diamond Pro excelled in colour purity and it showed no signs of any problems when deintensifying the CRT guns. **As 17in monitors go**, this Mitsubishi has a lot going for it, but the captive cable and sparse OSD let it down.

### PCW DETAILS

**Price** £327.82 (£279 ex VAT)  
**Contact** Mitsubishi 01701 278 684  
[www.mitsubishi.co.uk](http://www.mitsubishi.co.uk)

**Good points** Decent image quality and a quality tube.

**Bad points** Captive cable, sparse controls.

**Conclusion** A good tube is let down by the captive cable and disappointing OSD.

<b>Image Quality</b>	★★★★
<b>Features</b>	★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★

## Samsung SyncMaster 700IFT

**In the quest for a flatter CRT screen**, Samsung has gone its own way, ignoring both Sony and Mitsubishi's aperture grille tubes. Samsung has developed the DynaFlat tube, based on shadow mask technology rather than aperture grille. Some users still prefer shadow mask units since they don't have the damping wires present in aperture grille monitors. That said, the colours aren't quite as vibrant on a shadow mask unit, so it's a give and take situation.

The screen does look flat on the



Samsung, but not quite as flat as the FD or NF tubes from Sony and Mitsubishi respectively. This 17in model is attractively styled, but the connectors at the rear are not recessed, making it impossible to place the monitor flush against a wall or office partition. There are both D-SUB and BNC connectors at the rear, although you have to navigate the OSD to switch between the two, limiting their usefulness.

All the OSD controls are hidden on an extendable panel in the fascia. Unfortunately, the controls are not very extensive, with the lack of colour convergence controls being the most alarming. That said, the colour registration was spot on. Contrast and brightness adjustment is handled by two analog wheels under the fascia, but there is no corresponding on-screen indicator for these controls.

Generally, image quality is good, but not as impressive as the offerings from Sony and Taxan. You can push the resolution up to 1,600

x 1,200 with a refresh rate of 70Hz. However, most users are likely to work at 1,024 x 768 or possibly 1,280 x 1,024, at which you'll receive a refresh rate of 85Hz.

**This is a good 17in monitor**, although at £316 ex VAT it doesn't offer exceptional value for money.

### PCW DETAILS

**Price** £371.30 (316 ex VAT)

**Contact** Samsung  
[www.samsungelectronics.co.uk](http://www.samsungelectronics.co.uk)

**Good points** Good looks and great colour registration.

**Bad points** Limited adjustment controls.

**Conclusion** A competent 17in monitor, but relatively expensive.

<b>Image Quality</b>	★★★★
<b>Features</b>	★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★



## Sony GDM-F400T9

**Sony invented the aperture grille CRT**, naming its revolutionary design the Trinitron. Sony's latest 19in unit uses the new FD Trinitron tube, which has an almost completely flat screen surface.

Like most Sony products, the design of the unit itself is excellent. The lines are smooth and the bezel surrounding the screen doesn't dwarf the display.

On the front you'll find an ASC button to automatically resize the image to fill the screen, and next to



this is a button to switch between D-SUB and BNC connection.

The OSD is controlled via a small joystick. Pressing the joystick in the middle activates the OSD, then it can be manipulated in all four directions to make display adjustments. This is one of the simplest and most intuitive methods of adjustment that we've seen. Moving the joystick in any of the four directions without activating the OSD will adjust the contrast and brightness.

At the rear, the D-SUB and BNC connectors have been mounted vertically to allow the unit to be placed against a wall, while at the side is a USB hub.

Image quality is nothing short of amazing with this latest Sony screen. The demanding Display Mate tests were no match for the GDM-F400T9. Focus was perfect across the entire surface, while colour purity was superb. Colour registration was also no problem, helped by the fact that the OSD had adjustment controls for horizontal,



vertical, top and bottom colour convergence. Even the moiré patterns were no problem, which is surprising for a sharp aperture grille display.

**Sony has produced the ultimate 19in CRT display.** If you can afford the high price tag, you won't be disappointed.

### PCW DETAILS

**Price** £821.32 (£699 ex VAT)

**Contact** Sony 0990 424424

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

**Good points** Unparalleled image quality.

**Bad points** Expensive.

**Conclusion** The best CRT we've ever seen, but you'll pay dearly for it.

<b>Image Quality</b>	★★★★★
<b>Features</b>	★★★★★
<b>Value for Money</b>	★★★
<b>Overall Rating</b>	★★★★★

## Taxan Ergovision 980

**Over the last couple of years**

Taxan has become a major force in the monitor market, producing high-quality products at a reasonable price.

The Ergovision 980 uses the Mitsubishi Natural Flat 19in aperture grille tube, which has already become popular in both the Mitsubishi Diamond Pro 900u and the Iiyama Vision Master Pro 450. However, to Taxan's credit, it's made better use of the tube than both its competitors.

One of the gripes with the Mitsubishi 900u is its confusing OSD, that makes it very difficult to



set up the monitor. Taxan, however, has incorporated a completely different OSD, making it far simpler to adjust the display, while retaining the comprehensive array of adjustment controls.

Taxan's improved design is also evident in the USB hub integration. Instead of mounting the USB connectors at the rear of the unit, Taxan has placed two on either side of the monitor base, making it easy to connect devices no matter where they are situated.

Image quality is superb and, with the exception of the Sony, the Taxan turned in the best performance. Horizontal and vertical line resolution proved exemplary, while colour purity and registration was also very impressive. The only area that the 980 had trouble with was moiré, but that's often a problem for very sharp displays.

At the rear are both BNC and D-SUB connectors, all of which are recessed enough to place the unit against a wall or partition.



There's also a button on the front fascia to switch between BNC and D-SUB, making it easy to connect two PCs at once.

**Even though** the Sony model is of a slightly higher quality, the Ergovision 980 is £200 cheaper, making it a very attractive prospect.

### PCW DETAILS

**Price** £556.95 (£474 ex VAT)

**Contact** Taxan 01344 484646

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

**Good points** Excellent image quality and design

**Bad points** Slight problem handling moiré.

**Conclusion** An excellent 19in unit at a great price.

<b>Image Quality</b>	★★★★★
<b>Features</b>	★★★★★
<b>Value for Money</b>	★★★★★
<b>Overall Rating</b>	★★★★★

# Editor's Choice

The monitor market has never been so cut-throat as it is now. A few years ago a good 17in monitor could cost you as much as a whole PC; these days it's the minimum size you should settle for with a new purchase. One reason the price of decent CRT screens has dropped so significantly is the growing popularity for LCD flat panel displays. LCD screens have become more affordable of late and subsequently the pricing in the CRT market has become even more aggressive. The other knock-on effect of the increasing popularity of LCD screens is the desire for flatter CRT displays. This is why we only looked at the flattest CRT monitors available.

There were four different technologies on show in this group test: Sony's FD Trinitron, Mitsubishi's NF Diamondtron, LG's Flatron and Samsung's DynaFlat tube. Unsurprisingly, the well-established technologies from Sony and Mitsubishi proved to be the most impressive in the test. However, both the LG and Samsung screens didn't have the damping wires that are synonymous with Trinitron and Diamondtron screens, which could gain them



▲ IN THE GDM-F400T9, SONY HAS PRODUCED A NEAR PERFECT 19IN CRT DISPLAY, BUT IT COMES AT A PRICE

favour with some users. Even though we looked at both 17in and 19in units, it was the two larger displays that really shone through. Although the 17in models were good, they didn't quite sport the same quality or array of features as their larger siblings. That said, the Iiyama Vision Master Pro 410 offered impressive value at only £269 ex VAT, but it had a few problems in the image quality department.

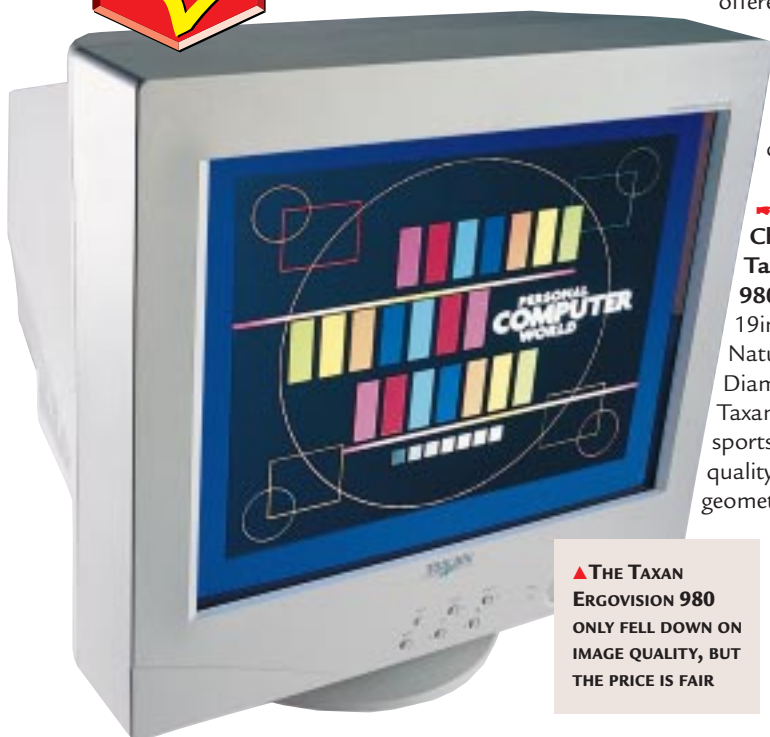
➤ **The Editor's Choice** goes to the **Taxan Ergovision 980**. Based on the 19in Mitsubishi Natural Flat Diamondtron tube, Taxan's latest addition sports superb image quality in both the geometric and colour departments. The styling is smooth and the array of OSD controls is intuitive and comprehensive.

▲ THE TAXAN ERGOVISION 980 ONLY FELL DOWN ON IMAGE QUALITY, BUT THE PRICE IS FAIR

There's a USB hub built-in with two ports on the left and right side of the base, making it easy to connect peripherals. Even though the Taxan couldn't quite match the image quality of the Sony F400, it grabbed the Editor's Choice due to its reasonable street price of £474 ex VAT.

➤ **The highly commended award** goes to the other 19in display on test, the **Sony GDM-F400T9**. This Sony monitor came as close to being the perfect CRT as possible. The image quality was better than anything we have ever seen, and the only thing that held it back from the Editor's Choice award was its steep price. At £699 ex VAT, the GDM-F400T9 is anything but cheap. But if you're looking for the best image quality available you're going to have to pay for it.

Besides the image quality, the Sony sports the best OSD control method, in the shape of an easy to manipulate joystick. It also has the largest array of adjustment controls we've ever seen, including four controls for colour convergence. For most users the price of this monitor will appear prohibitive, but if quality is more important than money to you, take a close look at the GDM-F400T9.



## DESKTOP PCs

Due to the fast-moving nature of the PC industry, we can only recommend particular PCs in the month we have seen them. Prices change almost weekly, as component prices from third-party suppliers fluctuate according to availability. So, for the best current PC buy, for instance, look at our most recent group tests.

It always pays to take a little care when buying a PC or in fact any hardware or software. For PCW's guide to buying direct, see page 293. And don't forget to use the PCW Order Form [page 294].

Everyone's ideal PC will have a different mix of components, with gamers needing a very good 3D graphics card, probably a 3D sound card and excellent speakers, while business users will need a good monitor and plenty of RAM.

## ENTRY-LEVEL PCs

Budget-conscious buyers might consider choosing a non-Intel processor like an AMD K6-2 or K6-III. But be aware that if you choose a Socket 7 chip, you'll only be able to upgrade to an AMD processor in future. Most Celerons are only being sold in Socket 370 format rather than in Slot 1 format, so if you get a Socket 370 processor you won't be able to upgrade it to a PIII at a later date. Check what processor format you will get when you order. If you are only offered a Socket 370 processor, insist on a Slot 1 board and 'Slotlet' combination with 100MHz RAM to maximise the upgrade potential. Look at September's group test for £699 (inc VAT) PCs.

We would recommend the following specification:

- AMD K6-2 400 or Intel Celeron 400 processor
- 32Mb RAM
- 4Gb hard drive
- Graphics card with 8Mb video RAM
- 15in monitor
- CD-ROM drive

Expect to pay around £599 (ex VAT) for this configuration, but you may have to pay extra for a sound card and speakers or a modem.

## MID-RANGE PCs

In the mid-range, around £1,000 (ex VAT) will get you a good all-round PC. The introduction of higher-speed PIIIs has meant the slower PIIIs have dropped in price, bringing them into this mid-range category. However, the stunning result of the K6-III, and its low price, make it worth serious consideration. Look for a minimum of:

- Intel PIII or AMD K6-III 500MHz processor
- 128Mb RAM
- 12Gb hard disk
- Good 3D graphics card with 16Mb video RAM
- 17in monitor
- DVD-ROM drive
- Sound card, speakers, 56K modem

If you want to spend a little more, but want the ultimate home machine see p138.

## HIGH-END PCs

If you're after a state-of-the-art machine, be prepared to spend around £1,500 to £2,000 (ex VAT). What you require at this price will be specific to your needs, depending on how you intend to use the machine. However, as a basic specification we would want:

- PIII 600 or Athlon 600MHz
- 128Mb 100MHz RAM
- 20Gb hard drive
- Good 3D graphics card with 32Mb video RAM
- 19in monitor
- DVD drive
- Sound card, speakers, 56K modem
- Bundled office suite

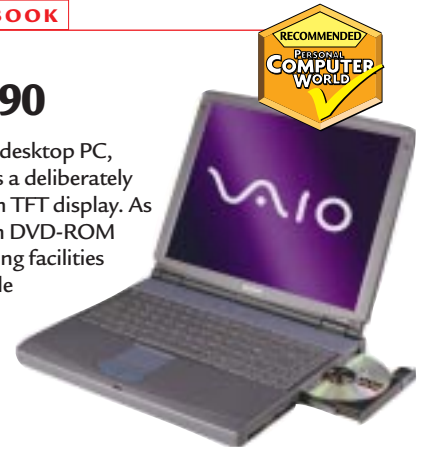
For a close look at Athlon, see last month's group test.

## HIGH-END NOTEBOOK

### Sony Vaio PCG F190

Designed to replace your desktop PC, Sony's Vaio F190 features a deliberately large keyboard and 14.1in TFT display. As standard it boasts built-in DVD-ROM and floppy drive, DV editing facilities and the muscle of a mobile 366MHz Intel Pentium II. Measuring 324 x 40 x 265mm and weighing 3.1kg, it excels as a power portable.

► PCW May '99, p84



**Price** £2,301.83 **Contact** Sony 0990 424424  
**Also Recommended** Dell Inspiron 7000 A366LT (PCW April '99)  
**Price** £1,761.33 **Contact** 0870 152 4850 ♦ Compaq Armada 7800, (PCW March '99) **Price** £3,461.55 **Contact** Contact 0181 332 3000

## MID-RANGE NOTEBOOK

### Dell Inspiron 3500

The Dell Inspiron 3500, with its Mobile Celeron 366, 64Mb of RAM and 4.8Gb hard disk is not only well specified, but also has an outstanding build quality. The screen has an even luminescence and vivid colours and it also comes with a very good software bundle.

► PCW September '99, p181



**Price** £1,585.08 **Contact** Dell 0870 152 4850 [www.dell.co.uk](http://www.dell.co.uk)  
**Also Recommended** Esprit Tycoon **Price** £1,468.75 **Contact** Esprit 01670 737888 (PCW September '99) ♦ Sharp PC-A150 **Price** £2,109.13 **Contact** Sharp 0800 262958 (PCW March '99)

## PDA

### Psion Series 5mx

Retaining the Series 5's good looks, Psion has doubled the memory size and processor speed to 16Mb and 37MHz respectively, and built email software into the ROM as well as improving the screen and backlight. It's not greedy, either, lasting the average user a month on a single pair of AA batteries.

► PCW August '99, p92



**Price** £429.99 **Contact** Psion 0990 143050 [www.pSION.com](http://www.pSION.com) **Also Recommended** Hewlett Packard Jornada 820 **Price** £945.88 **Contact** HP 0990 474747 ♦ 3Com Palm V **Price** £349.99 **Contact** 3Com 0800 731 1064 (both PCW July '99)

### COLOUR INKJET

## Hewlett-Packard DeskJet 895CXi

For all-round excellence you can't do better than the HP 895CXi. The quality of its output for both text and graphics is impressive given the swift speed at which they are produced. Even its 'econofast' mode could be used for vital documents, saving both time and ink. It takes a huge range of papers and replacing ink cartridges is a breeze.

► PCW October '99, p177



**Price** £292.58 **Contact** HP 0990 474747 **Also Recommended** Epson Stylus Colour 740 **Price** £179 **Contact** 0800 220546 ♦ Epson Stylus Colour 850 **Price** £239 **Contact** 0800 220546 (both PCW February '99)

### COLOUR PHOTO PRINTER

## Epson Stylus Photo 750

Easy installation, a five-colour cartridge for photo printing and an extensive driver make this printer an attractive proposition. Its photo reproduction could not be faulted and its job turnaround is impressively fast, too. Black text on photocopy paper was a little disappointing, but the price should suit most pockets.

► PCW October '99, p180



**Price** £239 **Contact** Epson 0800 220 546 [www.epson.co.uk](http://www.epson.co.uk) **Also recommended:** Lexmark Z51 **Price** £211.50 **Contact** Lexmark 01628 481500

### BUDGET LASER PRINTER

## Kyocera FS-680

In a chassis designed by Porsche, the FS-680 is a speedy little printer, churning out 9ppm. It is aimed at small workgroups and you can buy an optional Ethernet adaptor to include it on the network. It also comes equipped with a 50MHz PowerPC processor and 4Mb of RAM, upgradable to 36Mb.

► PCW September '99 p96



**Price** £351.33 **Contact** Kyocera 0345 103104 [www.kyocera.de](http://www.kyocera.de) **Also recommended** Samsung ML-5100A **Price** £292.58 **Contact** Samsung 0800 521652 (PCW July '99 p98)

### BUSINESS LASER PRINTER

## Hewlett-Packard LaserJet 4050TN

Hewlett-Packard dominates the laser printer market and it's easy to understand why when you see the output from this printer. Its 1,200dpi resolution is outstanding, and with a 133MHz NEC processor and 16Mb of RAM it can turn out an impressive 16ppm. On top of all that it comes network-ready.

► PCW September '99 p96



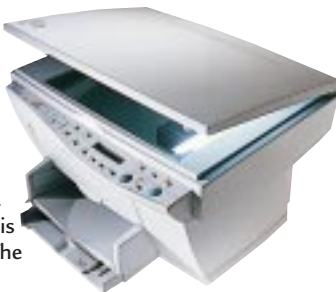
**Price** £1,580.38 **Contact** HP 0990 474747 [www.europe.hp.com](http://www.europe.hp.com) **Also recommended** Lexmark Optra K1220 **Price** £658 **Contact** Lexmark 01628 481500 (PCW February '99 p201)

### MULTIFUNCTION DEVICE

## Hewlett-Packard Office Jet R45

The Office Jet R45 is an excellent colour multifunction device. It has a colour inkjet printer, with a resolution of 600dpi, a colour scanner and a fax all in one. Its colour output is impressively rich and vibrant. The 30-bit scanner supports a maximum resolution of 600 x 2,400dpi optical and is fast, easy to use, and rendered excellent results.

► PCW November '99 p96



**Price** £399 **Contact** Hewlett-Packard 0990 474747 [www.hp.com](http://www.hp.com) (PCW November '99)

### FLATBED SCANNER

## Epson GT-7000 USB

This 600dpi scanner performed excellently in all of our tests, with good colour accuracy, text reproduction, and picture quality. Installation is a breeze using the USB port. We were impressed with the robust build quality and a lid that hinges to close flat with thick targets – all in all a great unit.

► PCW November '99 p191



**Price** £179 **Contact** Epson 0800 220 546 [www.epson.co.uk](http://www.epson.co.uk) **Also Recommended** Black Widow 9636 USB **Price** £89 **Contact** Black Widow 01324 825 999 [www.blackwidow.co.uk](http://www.blackwidow.co.uk) (PCW November '99)

## DIGITAL CAMERA

### Canon Powershot Pro70

This good-looking camera takes amazingly natural-looking pictures and has enough features to keep any user happy. Its dual Compact Flash slots make for extended periods without having to download, while its 1,536 x 1,024 pixel resolution will give you superb prints.

► PCW May '99, p199



**Price** £1,173.83 **Contact** Canon 0121 666 6262 **Also Recommended** Ricoh RDC-4200 **Price** £500 **Contact** Johnson's Photopia 01782 753355 ♦ Olympus C-900 Zoom **Price** £650 **Contact** Olympus 0171 253 0513 (both PCW May '99)

## MONITOR

### Taxan Ergovision 980

The Taxan Ergovision 980 is based on the 19in Mitsubishi Natural Flat Diamondtron tube. It sports superb image quality and the array of OSD controls are intuitive and comprehensive. There's a USB hub built-in with two ports on the left and right side of the base, making it easy to connect peripherals.

► PCW November '99 p208



**Price** £556.95 **Contact** Taxan 01344 484646 [www.taxan.co.uk](http://www.taxan.co.uk) **Also recommended** Sony GDM-F400T9 **Price** £821.32 **Contact** Sony 0990 424424 [www.sony.co.uk](http://www.sony.co.uk)

## MODEM

### Pace 56 Solo

The 56K modem not only performed well in our speed tests, but also has some of the best features we have seen on this type of product. It can work as a standalone answering machine and will also store faxes when your PC is switched off. The memory is upgradable to 6Mb and it can even phone you back at a remote location.

► PCW August '99, p191



**Price** £164.50 **Contact** Pace Communication UK Tel 0990 561001 **Also Recommended** 3Com Professional Message Modem **Price** £149 **Contact** 3Com UK 0800 225 252 ♦ Diamond Multimedia Supra Express 56e Memory **Price** £99 **Contact** Diamond Multimedia UK 0118 944 4444 (both PCW August '99)

## REMOVABLE STORAGE

### lomega Jaz 2

If you need top performance and storage capacity, then lomega's 2Gb Jaz drive is the only one to go for. Its speed makes it ideal for a wide range of applications, while the Jaz media feels more solid than most and is fully compatible with 1Gb cartridges. In short, it represents good value for large storage capacity.

► PCW June '99, p168



**Price** £299 **Contact** lomega 0800 973194 **Also Recommended** Panasonic LF-D101 **Price** £351 **Contact** Panasonic 0800 444220 (PCW Oct '98)

## SOUND CARD

### Creative Labs SoundBlaster Live!

SoundBlaster cards have long been the best choice for non-professional users. The SoundBlaster Live! ups the ante, providing near-professional quality sound at a bargain price. And it comes with an impressive bundle of dedicated digital I/O daughtercard, speakers, subwoofer and games.

► PCW December '98, p92



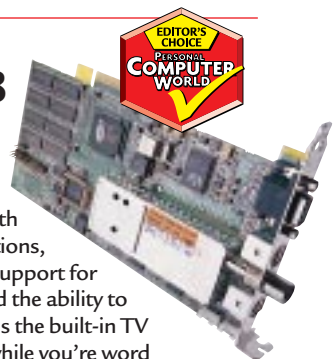
**Price** £149 **Contact** Creative Labs 01189 344744 **Also Recommended** Terratec EWS64 S **Price** £149.23 **Contact** Terratec 01600 772111 (PCW July '98)

## GRAPHICS CARD

### ATI All In Wonder 128

Using ATI's Rage 128 chipset, the All In Wonder 128 provides the ultimate video solution for your PC. Besides sporting a fast processor with 32-bit colour in 2D and 3D applications, there's also motion compensation support for smooth MPEG2 decompression and the ability to capture video. But most impressive is the built-in TV tuner that allows you to watch TV while you're word processing.

► PCW July '99, p78



**Price** £146.88 **Contact** ATI 01628 533115 [www.atitech.com](http://www.atitech.com) **Also Recommended** ATI Rage Fury **Price** £123.38 **Contact** ATI 01628 533115 [www.atitech.com](http://www.atitech.com) (PCW May '99) ♦ Matrox Millennium G400 32Mb **Price** £186.82 **Contact** Matrox 01753 665300 (PCW August '99)

## ACCOUNTING

### Intuit Quickbooks 6



Touted as the easiest accounting package for small businesses, QuickBooks has a long history and a large user base. Version 6 is the first 32-bit incarnation. It even monitors company performance and sounds the alarm should you fall behind.

► PCW November '99, p174



**Price** £199 (Pro version) **Contact** Intuit 0800 585058 **Also Recommended** MYOB **Price** £229.13 **Contact** Bestware 01752 201901 ♦ TAS Books **Price** £116.33 **Contact** Megatech 01372 727274 (both PCW June '98)

## PERSONAL FINANCE

### Microsoft Money Financial Suite 99



Microsoft Money Financial Suite 99 is our choice for personal finance. It offers online banking and updating facilities, as well as Sage compatibility, all at a bargain price.

► PCW November '99, p182



**Price** £49.99 **Contact** Microsoft 0345 002000 **Also Recommended** Quicken 98 **Price** £39.99 **Contact** Intuit 0181 990 5500 (PCW June '98)

## DATABASE

### Microsoft Access 2000

This industry-standard database application is also the best. With its wizards, infamous Office Assistants and standard Windows interface, Access 2000 is relatively easy for the novice. And its powerful relational features and VBA integration make it suitable for developers, too.

► PCW November '98, p220



**Price** £299 **Contact** Microsoft 0345 002000 **Also Recommended** FileMaker Pro 4 **Price** £169 **Contact** FileMaker 0845 603 9100 (PCW November '98)

## DTP

### Adobe InDesign



Seamless integration with PhotoShop and Illustrator, as well as multi-line text formatting, make InDesign a serious contender to knock QuarkXPress off its professional DTP throne. Time-saving features and a competitive price make it an attractive proposition.

► PCW August '99, p87



**Price** £468.83 (£399 ex VAT) **Contact** Adobe 0181 606 4000 **Also Recommended** QuarkXPress 4.0 **Price** £816.62 **Contact** Quark 01483 451818 (PCW June '99) ♦ Adobe PageMaker 6.5 **Plus Price** £351.33 **Contact** Adobe 0181 606 4000 (PCW August '99)

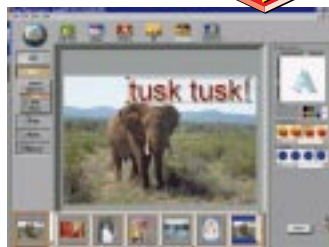
## IMAGE EDITING

### Ulead PhotoExpress 2.0



Ulead has succeeded in removing the frustration factor often involved in getting to grips with digital pictures. PhotoExpress 2.0 is a pleasure to use, with a clearly structured interface and fast, in-depth tools. It has pre-set editing modes for the novice and custom adjustments for each editing function, so the power user will be kept happy, too.

► PCW January '99, p202



**Price** £34.95 **Contact** BIT 01420 83811 **Also Recommended** Adobe PhotoDeluxe 3 **Price** £45.83 **Contact** Adobe 0181 606 4001 ♦ Paint Shop Pro 5 **Price** £69.95 **Contact** Digital Workshop 01295 258335 (both PCW January '99)

## DRAWING

### Adobe Illustrator 8



Illustrator has once again gained the top spot among drawing packages through its introduction of bold creative tools like the new Pencil Tool, Art Brushes and the Gradient Mesh Tool, to name but a few.

If Adobe's new page layout application, InDesign, takes off, the productivity gains from interoperability between InDesign, Photoshop and Illustrator will be hard to resist.

► PCW September '99, p165



**Price** £257.32 **Contact** Adobe 0181 606 4001 [www.adobe.com](http://www.adobe.com) **Also Recommended** CorelDraw 9 **Price** £327.82 **Contact** Corel 0800 581028 ♦ Sierra Windows Draw 7 **Price** £39.95 **Contact** 0118 920 9100 [www.sierrahome.com](http://www.sierrahome.com) (both PCW September '99)

## INFORMATION MANAGERS

### Starfish Sidekick 99



The best personal information manager boasts wide customisation abilities as its greatest strength. However, if you need heavyweight contact management, look no further than Goldmine 4 (see the details panel, below).



PCW August '99, p176

**Price** £39.99 **Contact** Starfish 0181 875 4455  
**Also Recommended** Goldmine 4 **Price** £229 **Contact** AVG 0171 335 2222  
 (PCW August '99)

## REMOTE ACCESS

### Traveling Software LapLink Professional

The high-end version of this extremely versatile product, LapLink Professional, has all the features of the standard version but also lets you print from the host machine onto a remote printer, or vice versa, and talk to whoever is using the host machine. It includes anti-virus and hard-disk cloning utilities.



PCW October '99, p134

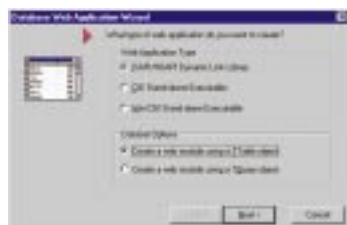
**Price** £176.19 **Contact** Traveling Software 0800 374849  
**Also Recommended** Symantec pcAnywhere **Price** £169.20  
**Contact** Symantec 0171 616 5600 (PCW October '99)

## PROGRAMMING TOOL

### Inprise Delphi 4



Delphi is not a cross-platform product, but does let you build browser-independent web applications. It reaches all the way from RAD business applications to fast graphics using DirectX. It beats Visual C++ on ease of use, and Visual Basic on performance.



PCW April '99, p198

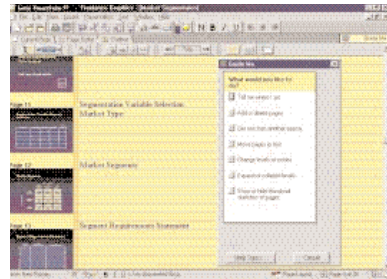
**Price** from £92 to £1,845 **Contact** Inprise 0118 932 0022  
**Also Recommended** Symantec Visual Cafe **Price** £217 or £580  
**Contact** Symantec 0181 317 7777 (PCW April '99)

## PRESENTATION GRAPHICS

### Lotus Freelance Graphics



Lotus' offering is our choice for electronic presentations. However, your decision may rest on which office suite you own or are considering, and as part of Office 97, PowerPoint won't let you down.



PCW March '98, p200

**Price** £49.35 **Contact** Lotus 01784 445808  
**Also Recommended** Microsoft PowerPoint 97 **Price** £325.47  
**Contact** Microsoft 0345 002000 (PCW March '98)

## WEB DESIGN

### Macromedia Dreamweaver 2



An attractive and easy-to-use interface makes this great for those looking for something with a little more power. Good table handling and extensive formatting options on a single, centralised property inspector, make it a joy to use.



PCW April '99, p103

**Price** £229 **Contact** Computers Unlimited 0181 358 5857  
**Also Recommended** Adobe PageMill 3.0 **Price** £92.83  
**Contact** Adobe 0181 606 4000 (PCW March '99)

## ANTI-VIRUS

### McAfee VirusScan Platinum

McAfee VirusScan Platinum's background scanning checks mail attachments, internet downloads and even ActiveX and Java applets for comprehensive protection.



PCW July '99, p86

**Price** £59.95 **Contact** Network Associates 01753 827500  
**Also Recommended** Dr Solomon's HomeGuard **Price** £29  
**Contact** Dr Solomon's 01296 318700 (PCW April '98)



# hands on

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**P**lug-ins are the order of the day in November's *Hands On*, used both for stunning **3D graphics** from Benjamin Woolley [p264] and **sounds** from Steve Helstrip [p260].

And lest you should think that the contributors to *Hands On* are blessed with **perfectly functioning** computers, both Chris Bidmead [p245] and Mark Whitehorn [p242] are on hand this month to reassure you that sometimes even the experts have problems with their systems.

You'll also find information on how the **Millennium Bug** is likely to affect an aspect of computing you may not have considered [p222], as well as tips on **managing databases** [p254] and dealing with foreign characters in your **word processing** [p250], plus in-depth advice for web developers and programmers [p234].

Whether you want tips to improve your productivity, solutions to tricky problems, or just advice and inspiration, *Hands On* is the place to find it. And, as ever, questions and suggestions are welcomed by all the contributors and by myself.

NIGEL WHITFIELD, HANDS ON EDITOR  
NIGEL\_WHITFIELD@VNU.CO.UK

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Pivot tables can be a useful tool for producing summaries, says Stephen Wells

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Mark Whitehorn unlocks the key to successfully managing data, when some of your users have made the break from the office and gone mobile

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Benjamin Woolley says it's best to employ a cinematic approach to create top-quality animations on the PC

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Tim Anderson looks at a variety of tools that can help take the work out of delivering your data to both printer and screen, as well as tackling readers' programming queries

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Happiness would be trouble-free data transfer, according to Mark Whitehorn, who also rounds up the best internet sites for hand-held info

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Experimenting with resolutions can be the key to making the most of your scanner, according to Gordon Laing

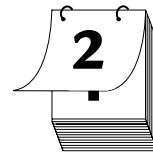
#### 272 Networks

Bob Walder explains how to get around an identity crisis when communicating with other networks, using digital signatures and certificates





# Getting personal



MONTHS TO GO!

Mark Whitehorn on how the Millennium Bug will affect **hand-held machines**.

It would be an impossible task to cover the year 2000 compliance of every PDA in detail, so we'll stick to the big three – Psion, WinCE and Palm – and SMS messaging. Each of the companies connected with PDAs has released details of their Y2K compliance. However, this is a complex issue and, inevitably, the statements that companies release are long and detailed. You should, therefore, visit the relevant websites and read all the available information if you are concerned about your PDA.

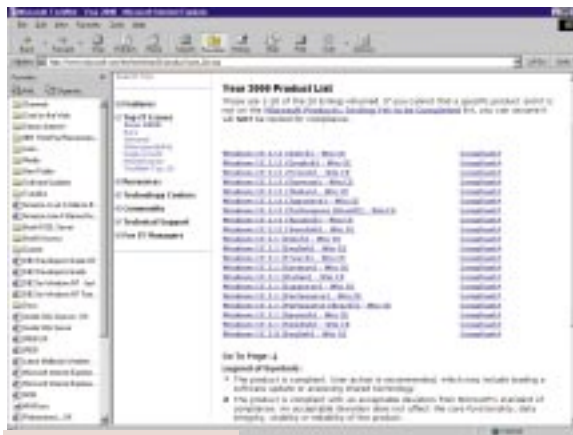
### ■ Palm

Palm has stated that on and after 1 January 2000, the Pilot 1000, Pilot 5000, PalmPilot Personal Edition, PalmPilot Professional Edition, Palm III, Palm IIIx, Palm V, and Palm VII devices will continue performing properly with regard to the date change. This applies to both the hardware and the companion desktop software for the PC and Macintosh.

However, there is a proviso that all other products used in connection with the Palm Computing products – including hardware, software and firmware – must accurately exchange date data with them. This is a fair statement to make, since Palm can't reasonably be responsible if you move dates to another platform that fails to handle them properly. See [www.palm.com/custsupp/helpnotes/palmapps/year2000.html](http://www.palm.com/custsupp/helpnotes/palmapps/year2000.html) for more details.

### ■ Psion

All Psion palmtops are Y2K-compliant. There are, however, compliance problems in earlier versions of the software that links them to desktops. For example, PsiWin 2.0/2.01's non-compliance extends only to the synchronisation and back-up functions. All other general connections and operational aspects of the hand-held are unaffected. These



▲ WINCE 2.0 AND ABOVE IS ESSENTIALLY COMPLIANT, BUT YOU'LL NEED TO CHECK YOUR HARDWARE

versions of PsiWin shipped with the first Series

5 machines, commencing in June 1997. They were superseded by PsiWin 2.1, which is freely available from Psion.com. Visit [www.pSION.com/year2000](http://www.pSION.com/year2000) for the company's Y2K readiness disclosure.

### ➔ PsiMac and MacConnect

Non-compliance of this software affects the Back-up/Restore function, which produces an error message. However, general connections and use of

the computer are unaffected. The upgrade consists of a floppy disk, a conformance statement and a new barcode label that includes the version number.

### ■ SMS products and Psion

For the three SMS products below, no operational aspects of the phone or the Series 3 are affected. Much of this software has now been replaced, either by upgrades or by different products, so the average user is unlikely to have any problems.

### ➔ Orange Messaging Link (SMS)

The date stamping of messages is non-compliant.

### ➔ Vodafone TeleNote Link (SMS)

Non-compliance causes the loss of messages.

### ➔ Message Express (SMS)

Non-compliance extends to the date stamping and loss of messages.

### ■ WinCE

Windows CE 2.0 and above is essentially Y2K-compliant (see above) and the same applies to Windows CE services. Unlike Palm and Psion, Microsoft doesn't produce hardware for its OS, so you will also need to check that the particular WinCE device you have bought is itself compliant. However, since WinCE machines were developed after the Y2K problem came to light, your PDA is likely to be compliant. See [www.microsoft.com/technet/year2k/product/product.asp](http://www.microsoft.com/technet/year2k/product/product.asp) for more information.

### ■ Summary

Essentially, there is both good and bad news. The good news is that your PDA itself is likely to survive the Y2K traumas. The software that you use to exchange data with your PC or Mac is likely to be fine, but it is best to use the most recent version. The bad news is that any additional software that you run on your PDA may or may not be Y2K-compliant and, since much of it is shareware, there are unlikely to be legally-binding guarantees available.

In addition, data sent to a PC or Mac can be moved accurately, but may be handled incorrectly once it gets there. However, the relatively recent arrival of PDAs means that there will be much fewer problems than on other platforms.

## PCW CONTACTS

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**The bad news is that some software on your PDA may not be Y2K-compliant**



# Running with a fast crowd

Connections to high-speed services will need **extra security measures**, says Nigel Whitfield.

**M**any PCW readers are waiting with bated breath for high-speed net services via systems like cable and ADSL, and a lucky few might even have been connected by the time you read this.

For many others, though, there's plenty of time to plan. What are you going to do with the connection? What will you connect to the end of it? And, what are the security risks?

The latter is something I've touched on before in this column, and it's well worth revisiting. Whatever operating system you're using, check to see what security updates you need – and not just ones for people running web browsers.

**In the past, the tactic of** attacking systems that are online has often been used on Internet Relay Chat (IRC), where it's easy to see if someone's connected. When you have an always-on connection, people don't need to see you online. They can attack your PC in plenty of ways – and if you're still running an original Windows 95 system, you're vulnerable.

Get the service pack, the password list update and the Winsock update, as well as all the browser fixes. And, unless you really need it, it's probably a good idea to turn off file sharing.

Mac users might need to prepare too – with a newer

version of OpenTransport. There are problems in some versions with the Dynamic Host Configuration Protocol (DHCP), which is often used to allocate IP addresses on networks.

Unix users also need to go through the security on their systems and make sure it's patched – and consider installing security software to check inbound connections. It's far from clear yet whether people will be able to run servers and accept inbound connections on a home net link via ADSL or cable.

In fact, it's likely many companies will restrict your ability to offer things like



**▲ Fig1** SIMPLE SOFTWARE CAN HELP YOU TRACK UNAUTHORISED CONNECTIONS AND PROTECT YOUR COMPUTER

web and FTP servers, unless you pay a premium for a business account.

**Technical and financial** considerations lie behind that decision. Also, some home users will welcome the tight firewalls that prevent them running servers, since they will prevent users from outside being able to gain easy access to your computers. Some, however, won't be happy. So a brief digression into the reasons might be in order. On the technical front, an always-on connection is going to invite

people to leave their systems on all the time, running things like ICQ (an internet tool

that informs you who's online at any time and enables you to contact them).

Each machine that's connected will require an IP address allocated to it – and those are in short supply. At the moment, an ISP simply uses one address for each of their modem lines since not everyone will be connected at once.

With a permanent link, they'll need a lot more addresses, and shoehorning those into the current space isn't easy. So, instead, it's likely you'll be allocated an address in a private range, and a technique called Network Address Translation (NAT) will be used. This

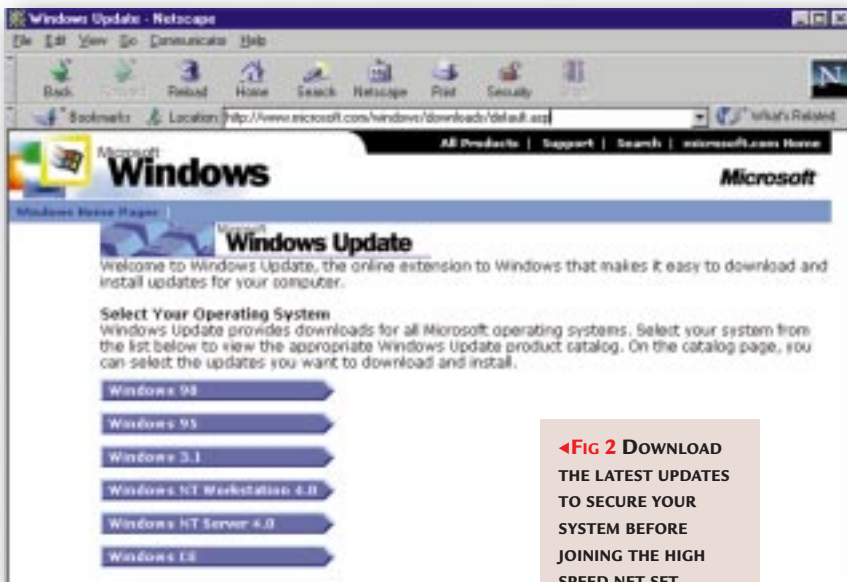
maps IP addresses on the fly, between the private and a smaller range of public ones.

Small ISDN routers, like the Zyxel Prestige, do this trick already, so that you can connect a network of machines to a single-user internet account. AOL does a similar trick, dynamically allocating an IP address when users connect to the rest of the net, rather than an AOL service.

**The problem with NAT** is obvious: it's easy for the router to know which machine on the private network is making an outbound connection, but when a connection comes into an address, how does it know which of the many private machines to route it to? It can be done, but it's not straightforward – so don't expect it for a bargain price, especially not when the ISP can charge you more for a fixed address. If you do end up with a link to the net that allows you to accept inbound connections, however, you need to think carefully about what you'll allow on your system. You might even want to re-appraise what operating system you'd run.

There will be many who'll disagree, but I'd be very reluctant to run Windows on a system that, potentially, anyone could access. Now may be the time to investigate running Linux or a flavour of Unix, either as your desktop machine, or configured to act as a proxy server. This

**Whatever system you're using, check to see what security updates you need**



**◀ FIG 2 DOWNLOAD THE LATEST UPDATES TO SECURE YOUR SYSTEM BEFORE JOINING THE HIGH SPEED NET SET**

would cache web pages and protect important information on your PC from prying eyes – effectively a firewall within any protection offered by the net provider. You might think that's unnecessary, but there have been stories from the US of cable modem owners being able to browse the drives on neighbours' systems where file sharing is turned on with no passwords.

Users going down the Unix route will need to think about what they want to be able to do through a server, and how to protect it. A web proxy server is easy to configure, but what about other things?

**First, I'd recommend** a copy of 'tcpd'. You'll find this as standard on many Linux systems, and it allows you to specify which hosts are allowed to connect to different ports – it's part of a package called tcp\_wrappers. By default, configure it to reject all connections, and then allow a selected few through.

You can also configure a banner. Fig 1 shows the login banner presented on all my Unix systems, giving a clear warning about the Computer Misuse Act.

At the same time as it displays the banner, tcpd records the host name and, if possible, the user name of the person connecting. Unauthorised connections result in a finger command checking to

see who's logged on to the remote system. This information is usually enough to identify the user.

**It's simple to** set all this up too. In the inetd.conf file, which controls services such as telnet daemons, comment out anything

```
you don't need running, and add:  
telnet stream tcp nowait ✓  
NOLUID /usr/local/etc/tcpd ✓  
telnetd
```

This runs tcpd with telnetd as a parameter, instead of telnetd direct. Depending on your flavour of Unix or Linux, the line might look slightly different.

The /etc/hosts.allow file controls who's allowed access, and what happens when it's denied. Here's the line for telnet and the global denial message:

```
telnetd: ✓  
hando.diversity.org.uk ✓  
comet.diversity.org.uk : ✓  
banners  
/usr/local/etc/notices : ✓  
ALLOW  
ALL : ALL : spawn ✓  
(/usr/local/etc/safe_finger ✓  
-l a%h | /bin/mail -s ✓  
fags\:%d-%c ✓  
nigel) & : banners /usr/ ✓  
local/ etc/notices : DENY  
(Key: ✓ code string continues)
```

Finally, a message in /usr/local/etc/notices, called telnetd, provides the text that's displayed, with % substitutions for the name and host name of the incoming connection. You can similarly protect services such as FTP and NNTP ports, ensuring that only those people you nominate can access your system. I can connect to my servers from the offices of certain clients, for example, but not elsewhere. Remember that if you go for a firewall, much of the software available blocks everything, and forwards TCP/IP packets you specify. For many things that's adequate, but sometimes it's not.

Some programs use the User Datagram Protocol (UDP), rather than TCP, so you need extra work to make them operate through a firewall.

A part of the TIS Firewall Toolkit, <www.tis.com> called plug-gw, allows you to specify that when a connection comes in, it's routed to a specific port. I use this to allow connections, for example, to pass through a firewall on port 5003 for FileMaker Pro, connecting to a server on a private IP address. Plug-gw, however, doesn't pass UDP, and that's what FileMaker uses to look for the server and get a list of databases.

Fortunately, a handy little program called udprelay does the trick, and allows you to redirect UDP requests too. Run it on the same port, alongside plug-gw, and you have a complete system for controlling access to your FileMaker server, or any other similar program.

**If you're thinking** of taking the plunge into a high-speed net link – or just setting up a server – you need to think about the security. And while there are Windows firewalls and other precautions you can take, the most flexible solution is very likely to be a Unix or Linux system, controlling access and running whatever services you want to host.

So, dig out your PCW CDs, brush up on Chris Bidmead's Unix and Linux advice, and start to plan for the high-speed revolution.

But, for the sake of security, update your system now rather than later.

## PCW CONTACTS

Nigel Whitfield welcomes your feedback on the Internet column. Contact him via the PCW editorial office or email: [internet@pcw.co.uk](mailto:internet@pcw.co.uk)



# Screen break

Tim Nott finds that if Win98 Second Edition isn't funny, you should try a **mauve screen of death**.

If you've been itching to read all about Windows 98 Second Edition here, then I'm sorry to disappoint you. There really isn't that much to get excited about, especially if you already have most of the Windows 98 updates and don't need to connect more than one PC to the same ISP account with the new Internet Connection Sharing software. The bad news is that TweakUI has been removed from the CD-ROM. At the time of writing, the Windows 98 version of the latter was not to be found on the Microsoft website either. UK users can get the upgrade – which includes IE5 – by filling in a form at: [www.microsoft.com/uk/windows/win98\\_2nd.htm](http://www.microsoft.com/uk/windows/win98_2nd.htm). Have your credit card handy as the 'free' upgrade carries a charge of £16.82 to cover postage and packing.

## Blue screen spoof

It's been ages since we had a really good laugh in this column. Usually, computer-related jokes are excruciatingly unfunny, but I felt this *spoof* press release worthy of a wider public:

"In a surprise announcement today, Microsoft President Steve Ballmer revealed that the Redmond-based company will allow computer resellers and end users to customise the appearance of the Blue Screen of Death (BSoD), the screen that displays when the Windows operating system crashes.

"The move comes as the result of

numerous focus groups and customer surveys. Thousands of Microsoft customers were asked: "What do you spend the most time doing on your computer?"

"A surprising number of respondents said: "Staring at a Blue Screen of Death". At 54 per cent, it was the top answer, beating the second-place answer – "Downloading pornographic images" – by an easy 12 points.

"We immediately recognised this as a great opportunity for ourselves, our

channel partners, and especially our customers," explained the excited Ballmer to a room full of reporters. Immense video displays were used to show images of the new customisable BSoD, which appeared side-by-side with the older static version. Users can select from a collection of "BSoD Themes", allowing them to instead have a Mauve Screen of Death or even a Paisley Screen of Death. Graphics and multimedia content can now be

incorporated into the screen, making the BSoD the perfect conduit for delivering product information and entertainment to Windows users.

"The Blue Screen of Death is by far the most recognised feature of the Windows operating system, and as a result, Microsoft has historically insisted on total control over its look-and-feel. This recent departure from that policy reflects Microsoft's recognition of the Windows



▲ Fig 1 TRANSPARENT ICON TEXT – DO IT WITH SEETHRU

desktop itself as the "ultimate information portal". By default, the new BSoD will

be configured to show a random selection of Microsoft product information whenever the system crashes. Channel partners can negotiate with Microsoft for the right to customise the BSoD on systems they ship.

"Major computer resellers such as Compaq, Gateway, and Dell are already lining up for premier placement on the new and improved BSOD. Ballmer concluded by getting a dig in against the Open Source community: "This just goes to show that Microsoft continues to

innovate at a much faster

pace than Open Source. I have yet to see any evidence that Linux even has a BSoD, let alone a customisable one."

## Transparent tip

The screenshot accompanying August's tip on stretching tiny bitmaps to use as wallpaper produced a flurry of enquiries asking how I managed to get a transparent background to the icon titles. Well, I've mentioned Mike Strong's SeeThru [Fig 1] before, and we've also had it on the CD-ROM, but that was two years ago, so here it is again – this time on the PCW website. STUP102V.ZIP includes the runtime Visual Basic files required. If you already have MSVBVM50.DLL and COMDLG32.OCX, then the file you want is STUP102.ZIP.

## All thumbs

One problem that crops up regularly in my mailbox is the failure of Windows 98 to display a thumbnail or 'Image Preview' of a selected graphic file when using Web Page view in Explorer. Despite being an FAQ, this subject hasn't made the Q&A because I could find sweet FA about the

**Have your credit card handy, as the 'free' upgrade carries a charge**



# hands on windows

A. As with its predecessor, QuickView, this feature seems very fragile and liable to stop working properly at any time. Typically, it will refuse to display .jpg files but continue to show .bmps [Fig 2].

At long last, I've managed to find some information on the Microsoft Knowledge Base. Usually, this problem is a consequence of installing software that modifies the file extension properties – some versions of QuickTime have been fingered as a likely culprit.

According to the Knowledge Base, this affects the following file type extensions: .art, .bmp, .dib, .gif, .jfif, .jpe, .jpeg, .jpg, .png and .wmf. To rectify the problem, you need to edit the registry, so make sure you have a back-up first.

The keys you need to edit are in the first section, HKEY\_CLASSES\_ROOT. Look for each of the keys bearing the extensions listed above, including the dot. There should be two string values (with an 'ab' icon) in the right-hand pane of Regedit at the highest level of each key. These point to a general file type that determines the program that opens the file

– such as Windows Paint or PaintShop Pro. Don't alter these entries

The al pa Th su cr do rig

Repeat the process for the other errant file types, and the thumbnails should be restored. Some other graphic file types may also be previewable, but this is down to other software (such as the Microsoft Office import filters) and

although the same key names may be present the values will be different.

### ■ Another folder tip

In last month's issue, my tips included sorting folder contents by clicking on the headers in 'Details' view.

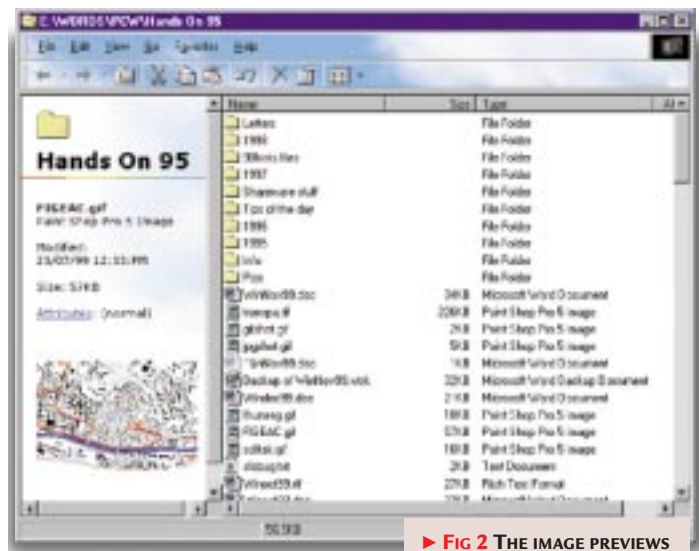
Rob Saville has since mailed me a related tip. Double-click on the join between the column headers, and the column will automatically re-size itself to the exact width of the longest entry.

### ■ Toolbar tips

Ian Maddison came up with some interesting tips on Windows toolbars, which should apply to Windows 95

and IE4 upwards. Ian notes that if you enable the Address bar (right-click on taskbar and select Toolbars), you can then type in the path to a folder to open it, either by pressing Enter or accepting one of the Autocomplete entries.

The interesting bit is that if you drag the folder icon out of the Address window on to the word 'Address', you will get a new toolbar of shortcuts added to the contents of that folder. Similarly, dragging to the desktop will create a



► FIG 2 THE IMAGE PREVIEWS IN THE WEB PAGE FOLDER VIEW MAY NOT DISPLAY ALL TYPES OF FILES

shortcut to the folder or file in the Address bar. Dragging the icon for an HTML file will create an Active Desktop item.

Dragging the icon from the top-left corner of a folder window on to a spare piece of taskbar will also create a toolbar of shortcuts. Finally, Stephan Freeman helpfully adds that dragging the My Computer icon on to the taskbar also creates a toolbar of its contents.

**And finally...** this column couldn't exist without your feedback. And, although I can't guarantee a personal reply to every email and letter, I do try to answer as many as possible.

There are two things which would both help me greatly and increase your chances of a cogent reply.

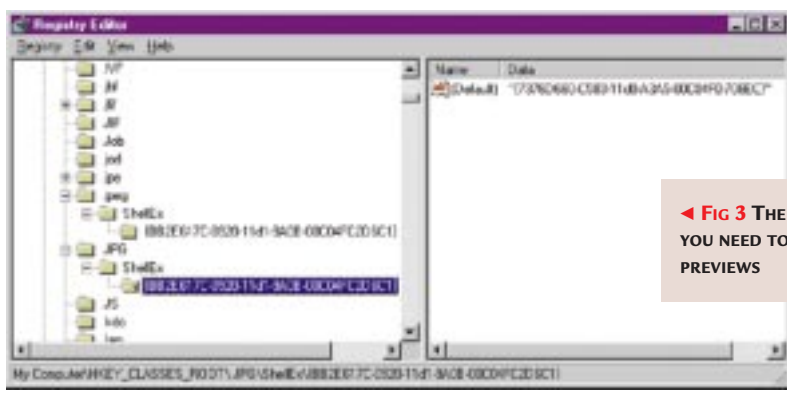
First, please don't send attachments without prior arrangement. That 2MB screenshot of your desktop may be fascinating, but I really don't want to download it over my relatively slow dial-

up connection. Second, please, please keep your email messages in plain text rather than HTML. To configure Outlook to do this by default, go to

Tools, Options, Send and select the 'Plain

Text' options. I look forward to reading your plain-text messages.

*This feature seems very fragile and liable to stop working properly any time*



◀ FIG 3 THE INCANTATION YOU NEED TO MEND IMAGE PREVIEWS



## Questions & answers

**Q** Shortly after installing IE5, my Temporary Internet File cache reduced the 'Amount of disk space to use...' from 75MB to zero. It's now impossible to make any alteration to this. Consequently, I have no cache and each time a page is accessed it downloads afresh.

IAN SAWYER

**a** According to the MS Knowledge Base, this can be caused by a damaged History, Cookies or Temporary Internet Files folder, or a file therein. First back up any cookies from the site.

Windows will restart, IE will recreate the deleted folders and you should be able to specify the cache size once again.

Or can I do the same thing using another OS?  
N V PRASHANTH

**a** It's possible with Windows 98 Second Edition, which has a new feature called Internet Connection Sharing for precisely this purpose. Alternatively, you can install third-party proxy server software, such as Wingate – there is a trial version available at [www.wingate.com](http://www.wingate.com) or the freeware Hhproxy, available from <http://home.t-online.de/home/sog-luebeck/hhproxy.htm>.

**Q** I'm sure the Windows 3 version of Solitaire used to have animation on some of the card backs, but this doesn't seem to work in Windows 95. Am I dreaming or did the sun in the picture of the palm tree really used to put on dark glasses and stick its tongue out every so often?

ADRIAN DIMENT

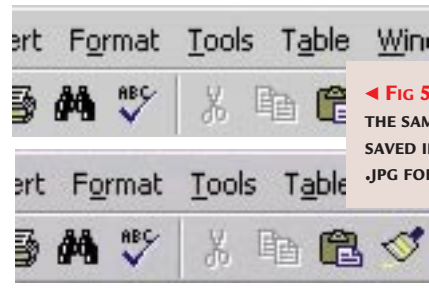


**▲ FIG 4** THE SUN HAS GOT HIS SHADES ON – BUT ONLY FOR TIMED GAMES

**Q** I have two networked Win98 machines, one of which has access to the Internet. Now I want the other machine to access the Internet through that first machine. Is this possible?

**a** Don't worry, you are not dreaming. The animated sun with the shades still works [Fig 4]. As with Windows 3, you must have 'Timed game' ticked in the Game, Options dialog.

**Q** Recently our business hand PC allegedly running Windows 95. However, this is nothing like our other Windows 95 PC. Despite having Win95 startup and



**◀ FIG 5** FUZZY BLEEDER – THE SAME SCREENSHOT SAVED IN .GIF (TOP) AND .JPG FORMATS

shutdown screens, it behaves more like Windows 3, with the old Program Manager and no desktop icons or task-bar. Tell me, have we been 'had' or is there a perfectly rational explanation?

TREVOR SHIFNAL

**a** It sounds as if Windows 95 was installed with the Windows 3.x interface – an option available for those who couldn't take the excitement of change.

Fortunately, this is easy enough to rectify. Open the file SYSTEM.INI, which you will find in the Windows folder (or directory in Win 3.x-speak), in Notepad. In the first section, headed [boot], look for the entry: Shell=progman.exe And change it to: Shell=explorer.exe

When you reboot you should find yourself back in the 32-bit world we have all come to know and love so much. You will probably need to do a little bit of work on the Start menu shortcuts, but help is at hand.

If you double-click on each of the Program Manager Group files (.GRP) in the Windows folder, these will get converted to sub-folders of the Start menu Programs folder.

Then you're back in business.

**Q** I want to create my own training manuals and would like to know how I can capture the menus and tool bars in Windows and Office 97. I see in your magazine that you do this regularly. Can you tell me how you do it?

GILL LEVY

**a** Most of the time I use the Alt + PrintScreen keys which copy the active window or dialog box to the clipboard. I then paste this into PaintShop Pro. You could, at a pinch, use Windows Paint, but PaintShop has various advantages.

First, PaintShop makes a good job of reducing file sizes by letting you reduce the number of colours to 256 and then saving as a .GIF. This gives satisfactory results on most screenshots except those containing shaded fills, which appear banded.

Second, it has its own built-in screen-grab utility which offers such refinements as including the cursor, or capturing 'objects' such as toolbars or menus. This saves a lot of fiddly work cropping images down.

One warning – don't save screenshots as JPGs. Even though this format is excellent at storing photographic images in compressed format, it can't handle hard-edge stuff very well. Images such as menus and toolbar icons will become fuzzy and 'bleed' onto the background as demonstrated in Fig 5.

**PCW CONTACTS**  
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# Divining Perls of wisdom

Tim Anderson **gets started** with Perl, and looks at how to put your Access data on the web.

**P**erl is the ideal language for server-side scripting, particularly as it is so widely supported. One snag is that it does not come with Microsoft's Internet Information Server or the Personal Web Server.

A common scenario is that you want to design your website on Windows, before uploading it to a Unix-hosted web server at your ISP. The answer is a free download, called ActivePerl, from ActiveState's website. It is currently about 5MB, and installs Perl not only on your web server but also on the Windows scripting host, so that you can use Perl from anywhere in Windows.

If you are running Unix, Perl may already be installed, and if not you can easily find it on the web. Just to warn you, there are some issues which mean that a script which runs on Windows might not run on Unix, but compatibility is still reasonably good.

The Perl interpreter is called PERL.EXE. Once it is installed, you can run a Perl script from the command prompt like this:

```
perl myscript.pl
```

ActivePerl has an installer that configures IIS and Windows file associations for you. If you need to tweak the installation manually, note that you must not put PERL.EXE or PERL.DLL (the ISAPI version) in cgi-bin or any other directory accessible from the browser. To do so can allow hackers access to a command prompt and would be risky.

**[FIG 1]**

```
#!/usr/bin/perl
print <<EOF;
Content-type: text/html
<HTML>
<HEAD>
<TITLE>This page generated by
Perl</TITLE> </HEAD>
<BODY>
This server is running
$ENV{ 'SERVER_SOFTWARE' }
</BODY>
</HTML>
EOF
```



**◀ ACTIVEPERL IS THE ANSWER IF YOU WANT TO RUN PERL ON WINDOWS**

first line. This is unnecessary on Windows, but on Unix it tells the system how to execute the script – a loose equivalent to a Windows file association. The filename shows where the Perl interpreter is located and on some systems it may need to be modified, for example to point to 'perl5' rather than 'perl'.

Overall, what the script does is generate an HTML page. This is a basic feature of any

dynamic website, whatever technology is used to drive it.

### ■ Creating a Perl script

A typical Perl script will have three basic tasks. First, it needs to access parameters derived from some event in a web browser. Second, it will perform some action based on those values, such as querying a database. Finally, it will generate a complete web page and print it to the standard output stream, which gets fed straight back to the browser. A minimal Perl script might bypass the first two steps as in Fig 1.

This code has some interesting features. First, it uses Perl's here-doc

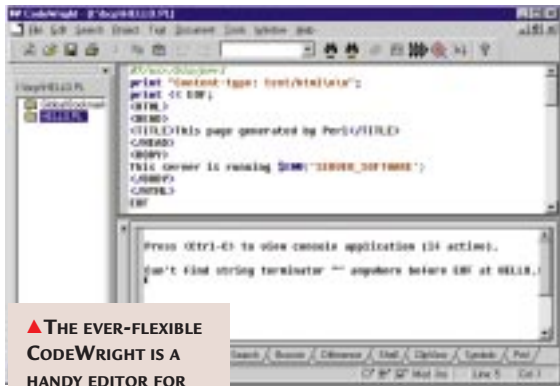
feature to spare you the trouble of inserting multiple print statements or quote marks. The statement `print <<EOF;` tells Perl to print everything until the given identifier, 'EOF' in this example, appears by itself on a terminating line. Second, note the \$ENV code used to retrieve the value of an environment variable. Third, you will notice the obscure 'hash-bang' statement which forms the

**To try out the script**, save it in the cgi-bin directory on your web server as 'hello.pl', for example, and then point your browser at it using the web address: <http://yourserver/cgi-bin/hello.pl>? The query at the end of the address may not be strictly necessary, but it tells the server that you want to execute the file rather than loading it to the browser. All being well, you will see a simple web page telling you what web server you are using.

Note that on Unix systems it is not enough simply to place the script in the cgi-bin directory. In addition, you have to mark the file as executable using the chmod command. For example, `chmod 755 hello.pl`

This tells the system to grant read, write and execute permissions to the owner of the file, and read/execute permissions to others.

This is a good start, but to do anything useful the script will need to take some parameters. These will be provided by a form completed by the user and sent to the server with Submit. Next month I'll look at how to do that.



▲ **THE EVER-FLEXIBLE CODEWRIGHT IS A HANDY EDITOR FOR CODING AND DEBUGGING PERL SCRIPTS**

■ **Database publishing**

Bara Mustafa

writes: 'I have been trying to get a database on the web using Microsoft FrontPage 98. My ISP supports FrontPage extensions but not CGI scripts. Would it be possible to do this using FrontPage or JavaScript, either with the .mdb file or with a .csv file?'

Most web-authoring tools claim to make it easy to include data access in a web page, but when it comes to doing it you often run into problems. The reason is that most solutions involve running some sort of data-access code on the web server, and a typical ISP-hosted website does not allow this.

The FrontPage extensions are not going to help. These extensions have two main functions:

First, they assist with authoring and maintaining a website by providing extra features such as FrontPage web themes, a task list, and a hyperlink map of the

entire site. These are only useful to the author or administrator.

Second, they support FrontPage components, also known as WebBots, which provide things like a hit counter, a full-text search function and support for online discussions. Most of the features on the Insert Component menu in FrontPage need the

If the ISP does not support

extensions. If you can often obtain the same or similar features by using a different technique, such as a CGI script provided by the ISP.

■ **In database publishing the key decision is**

whether to do dynamic or static publishing. Static publishing is just a matter of exporting your data to HTML. Many database managers will do this automatically. Access, for example, has an Export-HTML option that creates an HTML document from a table, query or

report. You can use a template to provide some basic formatting. Or you could write a routine in Visual Basic to query a database and build an HTML document from that.

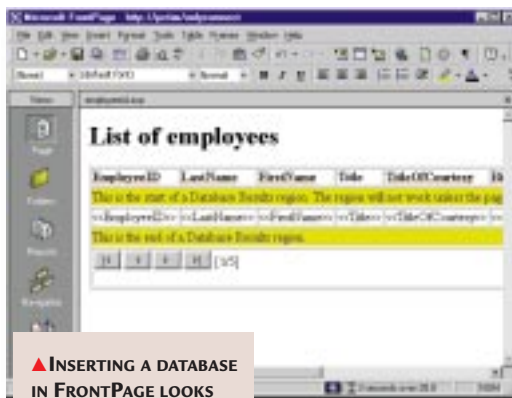
Static database publishing is all very well, but it is only of any use with small databases - nobody wants to browse a web page with several thousand lines. Larger databases can be broken down into small pages, with a navigation page using

▲ **VISIT WWW.TOPHOSTS.COM FOR A VARIETY OF US-BASED WEB HOSTS THAT PROVIDE DEVELOPER FEATURES**

hyperlinks or script-driven controls, but the fundamental problem is that the site lacks any intelligence. To get proper searching and sorting, dynamic database publishing is the answer. That means running server-side scripts, using Perl, ISAPI, Active Server Pages, Java servlets or some other technique.

An Access database has some special requirements. The Access data format has no published specification so it can only be read by Microsoft's database drivers, which run solely on Windows. If you want to use Access, you will need to use an ISP that runs Windows NT and

that allows you to use one or other of Microsoft's data-access technologies - such as Data Access Objects or Advanced Data Objects. The appealing Insert Database option in



▲ **INSERTING A DATABASE IN FRONTPAGE LOOKS EASY, BUT NEEDS ACTIVE SERVER PAGES TO RUN**

FrontPage uses Active Server Pages, a type of server-side scripting supported by Internet Information Server. Generally that means finding an ISP that provides NT servers and specifically supports Active Server Pages. I will look at how to use Active Server Pages in a future issue.

**PCW CONTACTS**

Tim Anderson welcomes your web development questions and comments, via the usual PCW address or by contacting: [webdev@pcw.co.uk](mailto:webdev@pcw.co.uk)

◆ If you are looking for an ISP to support database publishing, the best value choice is a US-based ISP. A good source of information is [www.tophosts.com](http://www.tophosts.com), which at the time of writing features ISPs offering full database support from just \$12.95 (£8.09) per month

◆ Find Perl for Windows at [www.activestate.com](http://www.activestate.com). This comes with very extensive documentation

◆ You might also want to look at the classic Perl book, Programming Perl, written by Larry Wall, Tom Christiansen and Randal Schwartz (O'Reilly, ISBN 1565921496), as well as Perl in a Nutshell, written by Ellen Siever, Stephen Spinbour and Nathan Patwardhan (O'Reilly, ISBN 1565922867)

◆ Finally, check out the main Perl website at [www.perl.com](http://www.perl.com)







# Restoring the faith with NT

Andrew Ward says you don't need **divine intervention** to retrieve critical .lnk files and lost data

Steve Ward was puzzled by my mention of Quake in a previous issue, since the original version of the game doesn't work under Windows NT. Of course, he's right, it doesn't – at least, not as shipped. However, on the Internet there is an add-on program called WINQUAKE, which allows Quake to run under NT [Fig 1]. You can download it from ID Software's own ftp site at <ftp://ftp.idsoftware.com/idstuff/quake/wq100.zip>. Installation is easy, and you just run WINQUAKE.EXE.

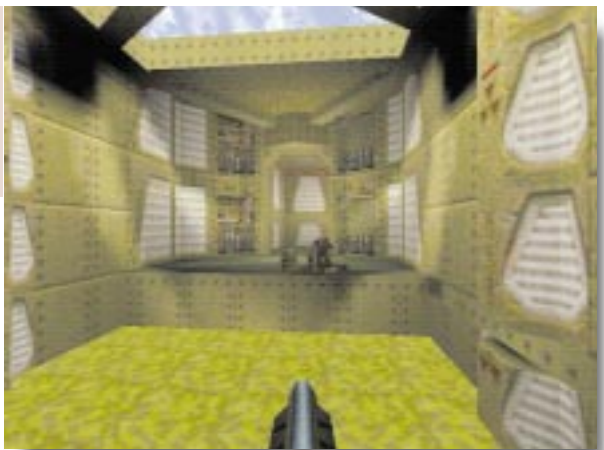
### Service Pack 6

Microsoft intends to bring out service packs on a more frequent basis in future, and it's likely that Service Pack 6 will already have been released by the time you read this. But, as I have mentioned before, service packs will no longer include major new features, but only product fixes. These will usually be fixes to security problems and cures for various bugs, including those introduced by Service Pack 5. So don't expect anything new and exciting in Service Pack 6, and it should only really be contemplated where you have a specific problem that it fixes. Don't automatically deploy it on a widespread basis: instead, read the service pack documentation to see if it's really relevant to you.

### Windows 2000

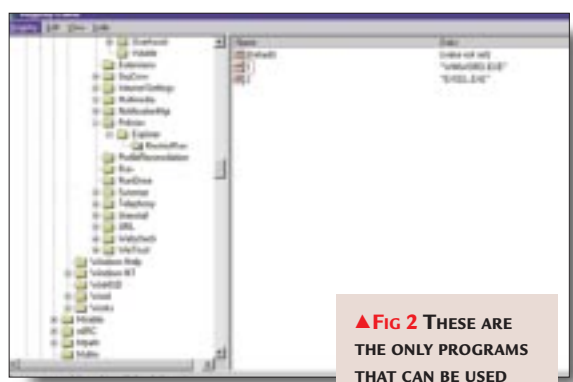
With the release of Windows 2000 imminent, or possibly even having taken place by the time you read this, some of you will be wondering if and when this column will start to feature the new operating environment instead of its current focus on Windows NT4. The answer to that is simple: they will appear as soon as people start sending in problems related to Windows 2000 that a wider audience would find relevant. I

▶ **FIG 1** JUST BECAUSE YOU'RE RUNNING NT DOESN'T MEAN YOU SHOULD STOP QUAKING



suspect this is going to be some time down the road.

Take Compaq, for example. Thanks to a major worldwide intensive training programme, Compaq now has more engineers trained in the deployment of Windows 2000 and migration from NT4 than anyone else – including Microsoft itself. Indeed, Microsoft uses training courses and material prepared with Compaq's help for its own staff training.



▲ **FIG 2** THESE ARE THE ONLY PROGRAMS THAT CAN BE USED WITH NT – IN THEORY

Yet the magnitude of the Windows 2000 migration task is so great that Compaq expects to take 18 months from the launch of Windows 2000 to complete the migration of its own servers and applications. So, don't hold your breath.

### Feeling insecure

Kevin Stuttard pointed out a loophole with the Windows NT system policies that, in theory, allows you to restrict the programs people can use [Fig 2]. In principle,

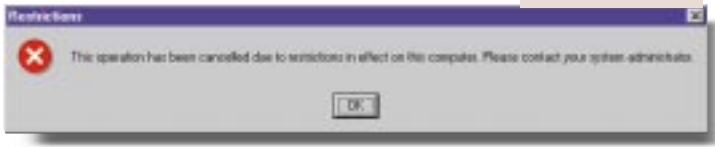
you can specify a list of executable files, such as WINWORD.EXE, that users are permitted to run. Then, when a user clicks on an icon or otherwise invokes Explorer in order to run an unpermitted application, Explorer will deny the request [Fig 3]. But Kevin has discovered that this mechanism is easily circumvented by an astute user, simply by renaming dastardly\_network\_trasher.exe to WINWORD.EXE.

That isn't the only way to get round this rather simplistic security device. If CMD.EXE is on the approved list, then the user can just run that and type the name of an executable. Of course, you can overcome that by not putting CMD.EXE on the approved list.

Another way to circumvent the security is to write a three-line Word macro to launch the unpermitted program. Once again, this is fairly easily stamped on, by using something like the Reflex Magnetics technology, which prevents people from running any unauthorised Word macros.

But really, this should only be viewed as a very superficial level of security. If you want to stop people running unapproved programs, you have to prevent them

▼ **FIG 3** STOP USERS RUNNING UNDESIRABLE APPLICATIONS



introducing the executable into the organisation in the first place.

Something like Disknet from Reflex Magnetics will prevent any floppy that isn't approved from being used. Also, products like MIMESweeper (and its component WEBSweeper) can be configured to prevent introduction of executable files via the Internet. Disknet is currently also being updated to provide the same level of security for CD-ROMs.

Nevertheless, if you want to press ahead and try the built-in Explorer protection, you need to create a DWORD entry at: HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer called RestrictRun and set the value to one. Any attempt to run any program thereafter will result in an error message.

Then you need to create a list of programs that the user can run at: HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Policies\Explorer\RestrictRun. Each entry is a string value whose name is a sequential number – the first one is called one, the second is two, and so on. The string should contain the name of the executable, for example WINWORD.EXE.

■ **Broken links**

Tony Franks almost certainly isn't the only NT user to have done the following, but so far he's the only one to admit it. What he did was to accidentally associate .lnk files with an application; then, realising his mistake, he broke the association.

Thereafter, Explorer can no longer run .lnk files, which basically means that programs will cease to be able to run from your Start menu or from the desktop.

remedied by creating a text file LINK.REG using the code in Fig 4. Simply double-click the file to repair your registry with the .lnk information.

Alternatively, if you have access to a working NT system, run REGEDIT and then navigate to the

► **Fig 5 TV CARDS CAN BE USED TO SET THE TIME FOR NT, AS WELL AS WATCH CRICKET**

and thus this general pro other instance becomes dam

■ **As seen on** Paul Webster between two r other readers: Windows NT:

Anyone who's bought a video recorder recently will have realised that it sets its own time automatically.

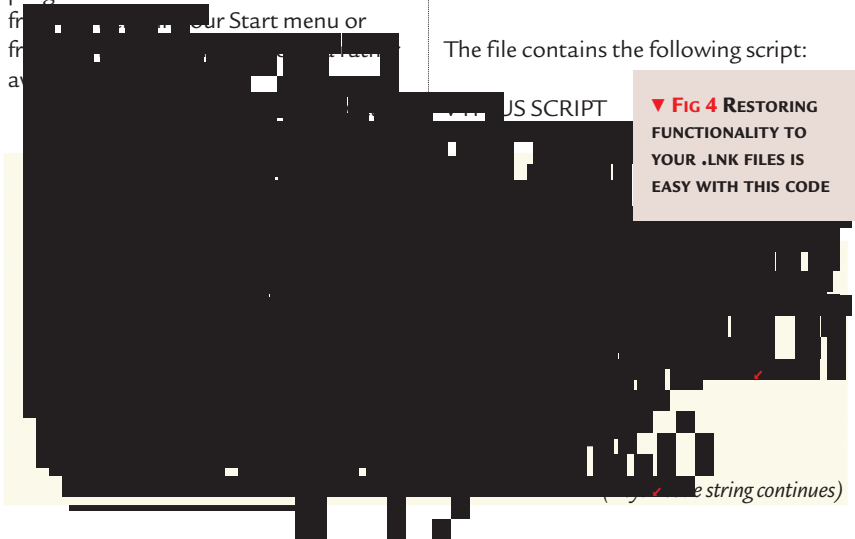
Assuming that this isn't some form of magic, my guess is that it takes the time from Teletext pages. You can apply the same principle in the NT environment, says Paul, and take the time from the Teletext page via a TV display card such as the Hauppauge Win/TV system [Fig 5].



The file contains the following script:

REGEDIT SCRIPT

▼ **Fig 4 RESTORING FUNCTIONALITY TO YOUR .LNK FILES IS EASY WITH THIS CODE**



TVSTATION BBC1  
 SET SYSTEMTIME  
 EXITAPPL

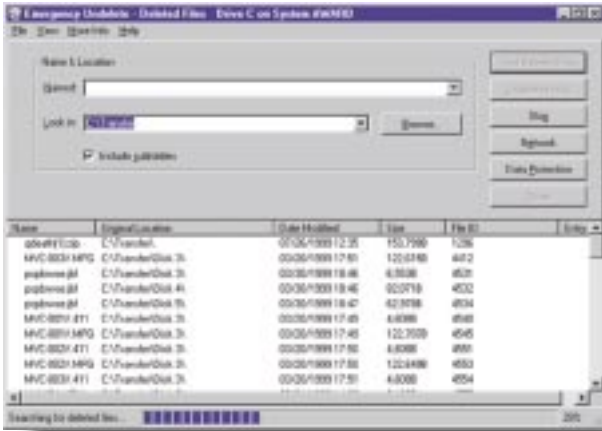
Paul implements this as a simple icon on the desktop, but of course you could schedule it to be executed at regular intervals, such as once a day, if

Tracey Clerkin writes in with a problem that must affect many users. I suspect that few people raise it because they don't realise that anything can be done. Tracey says a user accidentally deleted some critical files on a Windows NT4 SP4 workstation and she wants to know if there's any way of quickly undeleting such files, to avoid another fun evening spent searching through backup tapes.

The first port of call is the recycle bin, but there are many instances where deleted files don't end up there. Some files (myself included) are in the habit of using shift-delete in Explorer, which bypasses immediate deletion, or simply typing DEL in a command prompt window. Some files are too large for the recycle bin, or you may have the recycle feature turned off altogether. There are numerous other ways that files are deleted immediately.

Of course, there are deletion protection tools that offer a little more sophistication than the recycle bin, but these only work if you already have them installed, and are no help in an emergency.

With Windows 98, or even with FAT drives and Windows NT, undeleting files isn't too much of a problem. There are plenty of utilities to do this, and if you know enough about the file structure you can even do it manually (albeit somewhat painfully). NTFS is a different issue altogether and conventional wisdom says it can't be done.



◀ **FIG 6 UNDELETING FILES ON AN NTFS VOLUME IS POSSIBLE**

Actually, there is an answer even for NTFS drives, and what's more, it's freeware and downloadable from the web. If you have an emergency, it takes just a few minutes to download and install the product (it's just under 1MB) and undelete the file. Emergency Undelete from Executive Software <[www.execsoft.co.uk](http://www.execsoft.co.uk)> works like the Norton Utilities of old, in that it produces a list of deleted files and asks you which ones you want to restore [Fig 6]. I've tried it, and it works. I don't know whether it's by accident or design, but the file most recently deleted quickly appeared at the top of the list, whereas the full scan of the drive was clearly going to take some time. Of course, without full deletion protection, any deleted files are constantly in danger of being overwritten by subsequent hard disk usage. I tried emergency undelete on WinZip files, which are easily checked for integrity, and I didn't actually run into an overwriting problem – but maybe I was just lucky.

### ■ Performance tuning

Much of my mailbox traffic is taken up with requests for help with sizing Windows NT systems. With Windows NT Workstations, this is a difficult challenge, since you'll be running a mix of different applications. At times the video performance will be the bottle-neck, on other occasions it will be the hard drive performance, the CPU, or maybe the amount of memory. Unless you have an unlimited budget, you'll have to accept some areas of compromise.

For servers, sizing is more important, but in some ways easier. If you are running an Exchange mailbox server, for example, then user response time will be a critical factor. But because the server is

running much the same set of processes all the time, whatever performance constraint there is, if any, will be fairly predictable and consistent. Most software vendors will be able to provide specific recommendations on sizing NT systems for their applications. In reality, you won't always have the luxury of being able to specify a complete new set of hardware for every server, so the problem becomes an issue of tuning an existing system for optimum performance.

The first thing you should do is to remove any unnecessary software that could be impacting performance. Your first visit should be to the Services Control Panel to disable anything that isn't essential. In particular, many applications, including Microsoft ones, fail to remove their services after de-installation. Your next port of call should be to the Protocols and Services tabs in the Network Control Panel. Once again, remove anything that's no longer in use, but please do be careful to avoid removing anything important.

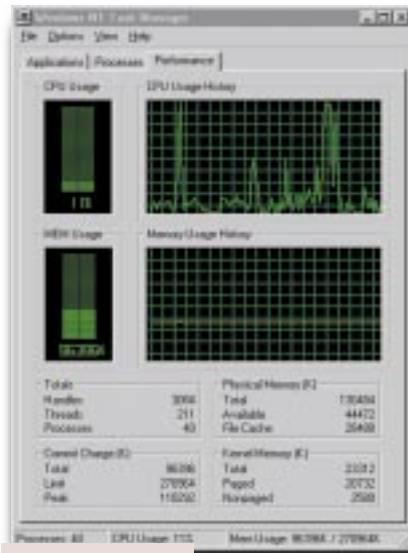
You may also have leftovers in the Startup group. I must re-emphasise that if you see FastFind anywhere you really should remove it immediately, although you shouldn't have Office installed on a server anyway.

After that, you can turn to the built-in tools that come with Windows NT for

checking and optimising performance – the Task Manager [Fig 7] and the Performance Monitor. Although the Task Manager is

a great deal easier to use than the Performance Monitor, and can provide a quick check on which process or processes are hogging CPU and memory, it can't really get to the root cause of a problem. An apparently CPU- or disk-bound system, for example, could be suffering from a lack of memory, causing excessive swapping.

Using performance monitor is a science in itself. If you want detailed instructions on using it to get to the root of performance problems, write to let me know.



▲ **FIG 7 TASK MANAGER CAN PROVIDE USEFUL PERFORMANCE MONITORING INFORMATION**

## PCW CONTACTS

Andrew Ward welcomes your comments on the Windows NT column. Contact him via the PCW editorial office or email: [NT@pcw.co.uk](mailto:NT@pcw.co.uk)



# Catch the Phenom Express

**LG Phenom Express** upgrade is up for grabs for the most interesting email, says Mark Whitehorn.

In the September issue I wrote about how to upgrade your WinCE machine to CE Pro, using an LG Phenom Express as the sample machine. I also managed to coerce LG into providing two more upgrade kits as prizes to give away in the column. However, only one is left since Alan Johnson <alan\_johnson@amdahl.com> has just won the prize for initiative with the following email:

'I'd like to ask how you got hold of the upgrade, as my attempts to find a supplier which will sell me the upgrade have come to naught.

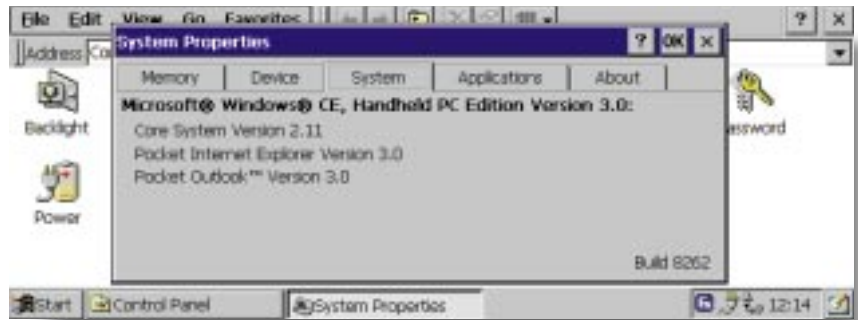
'I contacted LG's customer support (from the information on its website), which gave me the names of the distributors of the upgrade. However, those distributors refused to deal with me (being Joe Public), saying that I should go back and place the order with my retailer. Unfortunately, I bought my Phenom from Dixons, which doesn't seem to know about an upgrade being available.'

**It seemed only fair** to send him one of my upgrade kits. The other is up for grabs for the most interesting email from an LG Phenom user who hasn't already upgraded. It can be about anything, but don't forget to say that you have a Phenom

running version 2.0. Incidentally, LG has replied that suppliers are

unlikely to have the upgrade in stock, but they can order it from LG.

If you aren't sure which version of CE your machine came with, and are therefore in the dark as to whether you need to upgrade, go to the Control Panel, open System and select the System tab. This process can be seen above in Fig 1 and also introduces another little feature. The screen shot was taken using a built-in feature of the Phenom Express running CE Pro – pressing the Function key and the right arrow brings up a screen capture program. Neat, but not gaudy.



**▲ Fig 1**  
CHECKING OUT WHAT VERSION OF CE YOU'RE RUNNING

### ■ The good old days are alive and well

PDA's are all about

software – and the range of shareware and freeware that is available is extraordinary. It nostalgically reminds me of the early days of the PC, before 'big business' decided that it was profitable to move the suits in. A while ago, we published a list of URLs, and these seem worth repeating because we are constantly asked for the location of sites with good information.

**Top of the list** for all PDA's is, in my opinion: <http://hensa.pdacentral.com>. This is a mirror of a website called PDACentral, held at an academic site in the UK. In fact, given that the web is, well, a web, this could be the only URL

you need, because it must be possible to reach all of the others I

am about to quote from there. However, also worthy of note are:

### ■ Psion

<http://3lib.ukonline.co.uk>

This is a great site, run by a genuine enthusiast, Steve Litchfield.

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

I like this site and it leads to a great source of information about Psions – both current and past.

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

Naturally, this site has some very useful

information about products from Psion.

[http://ourworld.compuserve.com/homepages/martin\\_guthrie](http://ourworld.compuserve.com/homepages/martin_guthrie)

This site was recommended by Dave Summers <davesummers@csi.com> who says: 'Can I give a plug to Martin Guthrie's website? There is everything anyone needs to know about using a Series 5 with Compuserve. There are also ISP scripts for many other service providers all over Europe. I found the help invaluable and, as a 747 captain, use my Series 5 to send and receive email from hotel rooms round the globe.'

He's right, it is a great site. Nice one, Martin.

### ■ WinCE

Two good sources of Windows CE information are:

[www.microsoft.com/windowsce](http://www.microsoft.com/windowsce) and [www.wincecity.com](http://www.wincecity.com).

### ■ Palm

Sadly, the excellent site mentioned last time <[www.pilotlibrary.org](http://www.pilotlibrary.org)> is shutting down, but try: [www.memoware.com](http://www.memoware.com) instead. The following are also excellent:

<http://palmipilot.org>

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

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

### ■ Help!

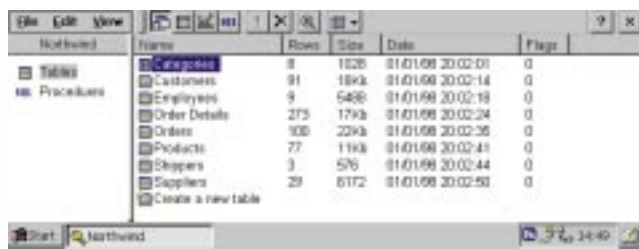
There has been an increase in the number of people using PDA's and most are coming up against problems of one sort or another. This has led to a major increase in the number of emails that I get. The good news is that some can be included in the column, but sadly most cannot – mainly because they are just too specific. For example:

*The range of shareware and freeware that is available for PDA's is extraordinary*

'I recently purchased a Sharp HC-4100 with 8MB of memory. I would like to set it up to connect to the Internet using a Nokia 6150 mobile phone, using the infra-red ports. If I need any special software, could you tell me where I would get it. I would be grateful if you could help me because I am stuck.'

It isn't that I don't want to help [chris@hames.freeseerve.co.uk](mailto:chris@hames.freeseerve.co.uk) (if you know the answer please email him). The problem is that even if I spend time finding the answer, the number of people with the same kit who read the column is likely to be too limited to make it worth including. This is why I try to keep the info in the column as generic as possible. However, I always feel guilty when I can't help, so please try to keep my stress levels down by asking questions that will benefit the largest number of people.

**Something that is** extremely welcome is email about generic or specific problems that readers have already solved. These are often too long to include in the column itself, but I am always delighted to include them as a text file, when I can, on the CD-ROM or website. For example, David Robertson has worked out the settings required to connect a Series 5 with an Ericsson DI 27



▲ **THE MAJOR ADVANTAGE OF UPGRADING TO CE PRO IS THAT YOU GET A COPY OF POCKET ACCESS**

modem to Virgin Net. Tim Amphlett, on the other hand, found a work-around for his ISP:

'My ISP (LineOne) only supports Java-enabled browsers - this rules out the CE version of Explorer. (At least on my HP 360LX it does!). My fix was to set the home/default web page to Yahoo and let it get the Portal Advertising benefits.'

■ **Opportunity doesn't knock**

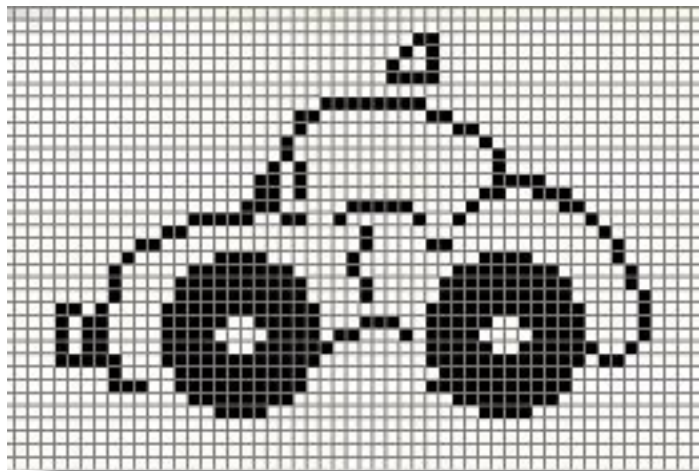
I don't have opportunities any more, I just have problems. For the same kinds of reasons, I usually don't discuss my own

problems with PDAs in this column. I assume that, in the main, you aren't concerned that I had a bad day connecting A to B, where A and B are specific bits of kit. On the other hand, I discovered recently that this can give the wrong impression. At the WinCE developers' conference I had my ear severely bent by a reader who felt that I gave the impression that PDAs are trouble-free, or worse, that I was so clever that I never had any problems. Would that it were so! Just to counteract that impression, here is an extract from a day (or two) in the life of a PDA columnist. You probably won't learn anything from this Pournellian saga, but it might make you feel better.

**I've just had a** really bad two days. I wrote part of this column on a Jounada and normally I transfer this to a Win95 games machine that is running WinCE services. However, I decided instead to install WinCE services on my IBM laptop, which

is running NT4 (Service Pack 4). I thought it would be useful to be able to transfer data to the machine that I normally take with me on my travels. This failed because of complexities with the port allocations on the IBM - which is a saga in itself - but let's not digress. Worse still, installing the WinCE services blew away my internet connection from the laptop. No problem, I thought, I'll just de-install the services. Still no dial-up. OK, I'll re-install Service Pack 4 because that is advised after software installation. Still no dial-up, and now no network connection.

OK, so I de-install the re-install of SP4 (which still leaves the machine rated at SP4!). Good, the network connection is back, but now I get a message that some



▲ **THE EVER ILLUSIVE TAXI, CAUGHT ON FILM FOR ALL THOSE WHO DENIED ITS EXISTENCE**

of the NT services aren't starting up. I spend an hour playing with the services - and eventually I get it down to just one service not starting up (something to do with the IR port, which is disabled in any case). Dial-up is now working and I still have a network connection! Great. This feels like success until I realise that most of a day has been spent getting almost back to where I was in the morning.

Next day, I decide simply to transfer the words from the Jounada to the Win95 machine. I know that this works - except it doesn't, it has mysteriously stopped working. It complains that the cable is faulty, but it claims exactly the same for a totally different WinCE machine and cable, so I suspect it is lying. I spend an hour swapping ports, baud rates, cables and WinCE machines - and still nothing will work. I decide to re-install CE services, but the install process demands a Win95 disk.

**After finally locating** one in an obscure cupboard, the installer complains it is dirty. I take a look and, surprisingly, it is filthy, so I clean it. Then the installer tells me that the files on the machine are newer. Ahhhh, so this is a Win95 disk, but perhaps not the Win95 disk used for this particular machine. Locate another 95 disk which looks newer (and cleaner). Do the disks have version numbers? Do Penguins like lettuce? (That is a big 'No', in case you have never tried feeding a Penguin). Try the 'new' disk and the install program crashes. Re-boot and try again. The install of CE Services apparently succeeds



# hands on

## PDA's

(without asking for a Win95 disk at all!), but the connection still doesn't hook up.

However, just in case I was getting bored, the error message has changed. I re-boot the machine interminably, fiddle with every parameter I can find and finally get a connection working at 19,200 baud. Should I try for a faster connection, or just move the file while the connection is there? No contest, I move the file.

It is now lunchtime. That's about one and a half days to carry out the simple task of transferring 650 words. I could have carved them in stone faster.

If there is a take-home message here it has to be that we are being sold PDAs as commodity items and, in the main, that is exactly what they are.

However, a more accurate view is that, to use a PDA for productive work,



Defender) will soon be appearing on a CD-ROM in zip files, and will include text files describing the installation. Mark has also managed to convert the sounds from the original game for the Psion and the appropriate zipped files will also be on the CD-ROM. Be warned, however, the sound files take up an extra 68KB of memory.

And while we are on the subject of games (not that I waste my time with

The Palm has several, but my favourite is one that has foxed people for some time.

Very occasionally, people would see a taxi cab run across the screen. This event was so rare that people who hadn't seen it (but were avid Palm users) called into question the veracity (and, indeed, sanity) of those who claimed to have been visited.

All in all it began to sound like alien abduction territory before Dale Gass, using Copilot's disassembler and debugger finally tracked it down. He then wrote a utility called Taxi, which enables the phenomenon to be seen. This comes with a set of instructions that works, but requires the date to be altered.

The following is an adaptation that seems to work on my Palm V without the need for date changes:

Open up Preferences and choose General.

Draw a small anti-clockwise circle on the screen, just above the calculator silkscreen button. If you make it small enough an Easter Egg should appear on screen.

Swap to another application, press and hold the Page Down button and draw a line from the middle of the Graffiti input area to the left-hand edge of the screen. Your pen should pass between the Applications and Menu silkscreen buttons.

Now it has to be admitted that the taxi is a little small, so we've shown an enlarged version so you know what to spot (see previous page).

Taxi and Dale's text file will both be appearing on a future cover disc.

▲ RELIEVE THE EIGHTIES WITH DEVENDER FOR THE PSION 5



▲ MOBILE WARFARE TAKES ON A NEW MEANING WITH NO MAN'S LAND FOR THE PSION SERIES 5

and to have a pool of knowledge that extends outside WinCE into the rest of the computing world, you are still going to have to work hard.

them, of course) those interested in real-time strategy games might like to check out [www.greatape.com](http://www.greatape.com).

This company has produced a game called 'No Man's Land' (don't email me if you think the name is politically incorrect).

### ■ Defending the faith

On a happier note, Mark Wheadon's Defender, which we carried on the CD-ROM for the Psion 3, is now available for the Psion 5 - although this version is known as DeVender (see above, top).

Both versions (DeVender and

### ■ Easter all year round

This column has been Palm-light for a while and that's because no-one is emailing me with Palm problems or tips. To try to encourage participation from the Palm community, what about an Easter egg?

## PCW CONTACTS

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# The KISS of life after death

Chris Bidmead **finds solace** in the philosophy underpinning Unix as he begins to rebuild his network.

I'm more than usually late delivering the column this month. This is basically because I've just suffered a death in the family – the family of servers on my network, I hasten to add.

I don't want to bore you with all the details, but a faithful old Novell NetWare machine that had been steadily running since mid-1994 finally took a dive, and sunk my text-retrieval database with it.

Yes, I'm fully backed up, thanks. But rebuilding the data into something workable can take a sizeable chunk of time.

**Actually, I will bore you** with a few details, because the exercise gave me a practical insight into some of the philosophical underpinnings that justify this column's existence.

The original justification for running a NetWare server on my Unix-based network was that I'd be able to write about how Unix interacts with other environments. And the older 3.x version of NetWare I'd loaded certainly did a great job of making use of old 486 hardware with a mere 16MB of RAM.

Well, as we discovered in this column about five years ago, the Unix-to-NetWare link turns out to be simple to set up (rather easier than connecting a DOS machine to NetWare, in most cases).

Indeed, it was so trivial that I can't recall getting any email

enquiries about NetWare for a very long time. So, not much to write about there.

As to the hardware economy of NetWare, it's true that the AST Premium SE 4/33 server was only modestly endowed, but it was also very large, hot and noisy. Back in the days when this was a catch-all '32bit' column, the AST had been the playground for my preliminary ventures into Unix. (Incidentally, it was then, in early 1994, that I first wrote in this column about what I called 'The Linux Conspiracy'. There's been a sudden

spate of letters from readers around the country asking me why I've said nothing about Linux.)

At the time, the AST's 'roomy 512MB hard disk' was plenty for what I was doing, but for NetWare I augmented it with a 'gigantic' 1GB DEC SCSI drive, thoughtfully donated by James Wickes, managing director of Ideal Hardware. That's the drive that took a dive last week. I should have been warned by its steadily rising noise level.

**The only reason** I put up with the AST/NetWare combination for so long was that it has been utterly trouble-free, a tribute to AST's build quality, and to a Mormon from Utah called Drew Major.

Drew was the team leader of a group of three programmers known as 'The SuperSet' that put the Novell network operating system together back in the early 1980s.

I met him in Geneva in 1991 and we had an afternoon-long chat about operating system design in general, and how and why he'd come to write NetWare. I understood how it was that NetWare achieved such a magnificent performance.

On an architectural level, Drew had decided to dispense with any semblance of virtual memory, running everything in RAM rather than augmenting the memory with swap files or partitions. Very unfashionable, that. The rival network operating system, LAN Manager from Microsoft, regarded virtual



▲ A UNIX-TO-NETWARE LINK IS SIMPLE TO SET UP

memory as canonical and paid for it with a limp performance that earned it the industry nickname the 'LAN Mangler'.

Similarly unfashionable, NetWare ran everything in the supervisor mode of the processor, giving every process intimate access to the whole system. Yes, there was a password-protection system designed to prevent users messing with the entrails, but this was only a layer on top of what was, effectively, one big kernel that hooked applications (NetWare Loadable Modules, or NLMs as they were called) inside it.

Drew had also hand-coded the core kernel code at assembler level, thinking the execution path through instruction by instruction in a way that tied NetWare remorselessly to the Intel processor. Again, this was against all the best practices of operating system design. But the thing worked magnificently, and dominated the server side of the PC industry for a decade.

Arguably, it went wrong for Novell when it began dispensing with Drew's eccentricities. NetWare 4, for example, introduced protected mode NLMs,

**As far as possible, Unix works on the KISS principle (Keep It Simple, Stupid)**



# hands on

unix

Internet  
Windows 98  
Graphi  
OS



▲ KDE RUNS KMid ARGUABLY A VERY CLASSY MIDI-PLAYER

which slowed down the operating system dramatically.

The Unix column isn't the appropriate place for a eulogy to NetWare, but I believe in credit where credit is due. By the way, my *Chambers Dictionary* gives 'eulogy' as 'speech or writing in praise of a person, etc, esp funeral oration...'

This may not, however, be NetWare's funeral as far as this column is concerned. Yesterday I re-established my text-retrieval data on the Windows NT server, which is running the Topic database software from Verity. Rather than haul the data across the network, the Verity software can now digest it locally.

You might think that this ought to speed things up. Actually, it doesn't. Fetching the data from Windows NT's local drive D: seems to take literally more than five times as long as when it previously collected it down the thin Ethernet cable from the old 486 NetWare box. Drew certainly knew a thing or two about fast file delivery.

### ■ So? Philosophically...

You'll gather from the above that

NetWare 3.x was the almost exact antithesis of Unix. But arguably they had one thing in common. As far as possible, Unix operates on the KISS principle (Keep It Simple, Stupid).

NetWare 3.x was inherently very simple indeed – like Linux, the core fits on a single floppy disk with room to spare. This was a problem for Novell CEO Ray Noorda, who was trotting it off to market for something like \$2,000 (£1,250) a shot.

Noorda's genius was to dress up NetWare not merely as 'a product' – a heavy red box packed with an armful of serious-looking manuals – but also as a way of life, with the invention of the

Certified NetWare Engineer – (CNE), backed by an elaborate exam system

and certificates to stick up on the wall. The whole thing became bigger than Scientology (which it closely resembled) and it made Noorda a billionaire several times over.

Does any of this sound familiar? It should. Bill Gates re-ran the entire NetWare story when he got his hands on what became Windows NT at the turn of the decade.

And this is why Linux is so worrying

for Microsoft. It's not that Linux is somehow 'better' than Windows NT (as Microsoft has shown, it's not hard to rig up a benchmark that demonstrates Windows NT's superior performance, although you have to juggle with some rather unlikely parameters to do this). It's not even an issue of the relative product costs to the end user. It's that Linux is how we do software in the Internet-informed, cast-your-bread-on-the-waters 1990s.

It strikes me that Windows NT and all that MCSE (Microsoft Certified System Engineer) paraphernalia belongs to the disconnected, competitive spirit of the 1980s. And customers are starting to catch on.

### ■ Router outage

I'd love to tell you that the NetWare fiasco was the only trouble I had last week. But that wasn't as bad for an aggressively active Unix adventurer as my Internet connection going down and resolutely staying down for the next four days while I scabbled away trying to rig up a solution.

Divine punishment, probably, for a rather pleasant press conference at the

### Box 1

Name: gpm Relocations: (not relocateable)

Version: 1.17.7 Vendor: (none)

Release: 1mdk Build Date: Mon Apr 12 20:08:36 1999

Install date: Mon Jul 19 18:12:19 1999

Build Host: vador.mandrakesoft.office

Group: System Environment/Base

Source RPM: gpm-1.17.7-

1mdk.src.rpm

Size: 454112 License: GPL

Summary: A mouse server for the Linux console.

Description: gpm provides mouse support to text-based Linux applications like the emacs editor, the Midnight Commander file management system, and other programs.

Gpm also provides console cut-and-paste operations using the mouse and includes a program to allow pop-up menus to appear at the click of a mouse button.

Gpm should be installed if you intend to use a mouse with your Linux Mandrake system.



beginning of the week with the nice people from Altec Lansing. It ended up with me walking away with a 'press sample' of the ACS45.1 PowerCube Computer Speaker system.

It's a three-piece system, with two small satellite speakers for a crisp stereo image and a powerful

sub-woofer to give you a solid, rounded base. It's the closest to real hi-fi I've ever heard from a computer system of mine. (I'm sitting here wrapped in Beethoven's Opus 132 in A minor as I write this – and the wife's just come in to complain it's too loud.)

**Altec Lansing's timing** was great because I'd just got round to installing the new sound stuff that comes with the Linux 2.2x kernel. Well, to be strictly accurate, my mate Robert Kusi, the one-time window cleaner, turned Unix guru, who has starred in this column before, did the installing. The new satellite speakers go either side of my monitor, and I decided to put the sub-woofer on my desk some way back from the monitor. I perched my ZyXEL Prestige 2864I ISDN router – another long-time star of this column – on top of the sub-woofer, just nicely in my line of sight so I can keep an eye on the LEDs which tell me what's connected and when.

An hour or so later the router lights twinkled out and the thing went into 'Norwegian Parrot' mode. Happily, Paul Lynch and his wife Liz from P&L Systems who'd set me up with the router

originally, back in October 1997, came to the rescue with a spare the following day. The spare mysteriously failed again within hours of my getting it going.

I'll conclude that particularly painful story next month. In the meantime, if

you have a three-speaker system with a sub-woofer – put the sub-

woofer on the floor as the manufacturers suggest. And keep floppy disks and delicate electronic equipment – particularly if it relies on FlashRAM – well away from the sub-woofer's powerful magnetic field.

#### ■ Notes for neophytes

I'm still being inundated with enquiries from beginners struggling with Linux, who'd just like a handle to get them started. Believe me, I still remember the feeling from my own early ventures when I first installed Linux five years ago.

Linux is Unix, which means it's not like Windows. It needs a quite different mindset – two different mindsets, in fact: one for Unix and one for free software. Rather than wander off on more philosophical ramblings, I'd better just direct you to a splendid, long article on this general subject by Charles Mann at <http://theatlantic.com/cgi-bin/o/issues/99aug/9908linux.htm>.

For a practical appraisal of what you're up against Unix-wise, there's a nice one-page introduction to Unix at [http://www.dartmouth.edu/~unix/classes/unix1/slides/print\\_pages.html](http://www.dartmouth.edu/~unix/classes/unix1/slides/print_pages.html).

#### ■ 'What?'

A frequent question that crops up is: 'What have I got installed on my system, and what can it do?' This can be a 'Big Question', and you might need to know rather a lot

about your system to find out (a Catch-22 of the kind Unix folks refer to as 'Fun with Recursion').

But if you've installed Caldera's OpenLinux or Red Hat or SuSe, or any of their variants you're in luck. The standard package installation method for these distributions is RPM, and there are some very nice things you can do with it. The command 'rpm -qa' will query all the packages in the installation database and list their names.

Of course, it's not a lot of use knowing you have, say, some package mysteriously called gpm-1.17.7-1.mdk on your system – you want to know what it does.

That's easy. Just enter the command 'rpm -qi gpm' (you don't need the version numbers or distribution ID), and you get something like *Box 1*.

But where exactly does it get installed, and how many files are involved? You can find this out easily by using the '-l' switch like this: 'rpm -ql gpm'.

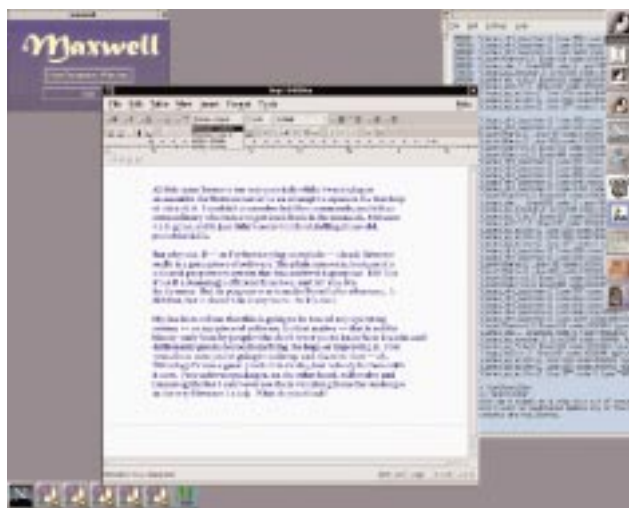
By the way, you'll notice I've installed Mandrake (from [www.linux-mandrake.com](http://www.linux-mandrake.com)) on my main Linux workstation. This is an enhanced version of the standard Red Hat distribution, with a bunch of extra stuff. If you have room on your hard disk you can just install everything and then mosey around with RPM whenever you have a spare moment to find out what you've got.

**One package** RPM unveiled for me on my Mandrake system is Maxwell, a free software word processor that works in a way that should be familiar to Microsoft Word users. It claims to be able to read Word 6 files, but I couldn't get this feature to work. Maxwell is still in beta (and this is the debug version – hence all the error messages in the terminal window to the right of the screen). Things may have improved by the time you read this.

The Mandrake distribution (and Red Hat) comes with a choice of Gnome, KDE and a couple of other GUIs. Page 246 shows KDE, running KMid, the classy midi-player put together by Antonio Larrosa Jimenez <[larrosa@kde.org](mailto:larrosa@kde.org)>.

## PCW CONTACTS

Chris Bidmead welcomes your comments on the Unix column. Contact him via the PCW editorial office or email [unix@pcw.co.uk](mailto:unix@pcw.co.uk)



◀ MAXWELL IS A FREE SOFTWARE WP BUT IS STILL IN BETA



# Warp feels web's weight

Terence Green mourns the **passing of Warp** development as IBM focuses on web-based applications.

**T**here's been such a lot of talk about what will happen in the year 2000, but one thing that seems clear is that we won't see IBM releasing another Warp client.

Michael Cogman writes to say he hopes my premonition that Warp 4 is the last of the OS/2 clients won't come to pass. If only IBM can raise the profile of Warp a little, he adds.

Sadly, this isn't likely to happen. I went to IBM's annual developer bash, Solutions 99, where a company spokesperson made it clear that IBM's priority for OS/2 lay with the server versions which keep many of the world's largest businesses going. If you're wondering who these customers are, have a look at the large OS/2 customer list <<http://rover.wiesbaden.netsurf.de/~meile/los2cl.html>>. It makes for some interesting reading.

For IBM and its customers the Warp client is less important, so IBM isn't investing in any new development other than keeping it up-to-date with Fix Packs and device driver updates (By the way, a new policy of separating device driver upgrades from Fix Packs, allowing you to upgrade drivers without applying a full Fix Pack, should be in operation by now).

There are always rumours in the newsgroups about a new OS/2 client, but I've stopped believing in the possibility. From the presentations at



▲ **IBM DEVELOPERWORKS IS A NEW IBM PORTAL AIMING TO ATTRACT INDEPENDENT SOFTWARE DEVELOPERS**

Solutions 99, where IBM was at pains to convince ISVs everywhere that it could be everyone's 'plumbing company', it's clear that IBM sees its future as providing the services and applications that link web-oriented clients to servers. In this new world, a client can be almost any device, provided it supports common standards such as Java and XML – which, of course, the existing Warp client can do.

**If you want to see where IBM is going** the best starting point is the new IBM developerWorks portal at [www.ibm.com/developerworks](http://www.ibm.com/developerworks). Click on the AlphaWorks logo down in the lower right-hand corner. AlphaWorks acts as a clearing house for new technology from

you're a developer and you like something that you see on AlphaWorks, you can contact the research team and get involved in the development process.

Even if you're not a developer, AlphaWorks is still a good place to see what's new. Web developers, for example, should look at

Wapsody, an example of what IBM calls 'transcoding' technology. The Wapsody codename is a play on WAP, the Wireless Application Protocol, which is a set of common standards for wireless applications being developed by the WAP Forum.

**Transcoding takes the** standard HTML stream from a normal web page and adapts it to suit the small displays and limited bandwidth of devices such as mobile phones. It saves the web developer from having to code separate web pages for a variety of formats. IBM is a big WAP cheerleader – it was a founder member and has a seat on the board, but others are catching on. Microsoft joined the Forum recently.

At the moment, the buzz around WAP is focused on mobile phones but the standards will apply to all wireless devices, and we can expect a plethora of application-specific appliances to emerge before long. Since Wapsody is a codename and has not yet been released at the time of writing, it may not appear under that name, but you can find it by searching for transcoding.

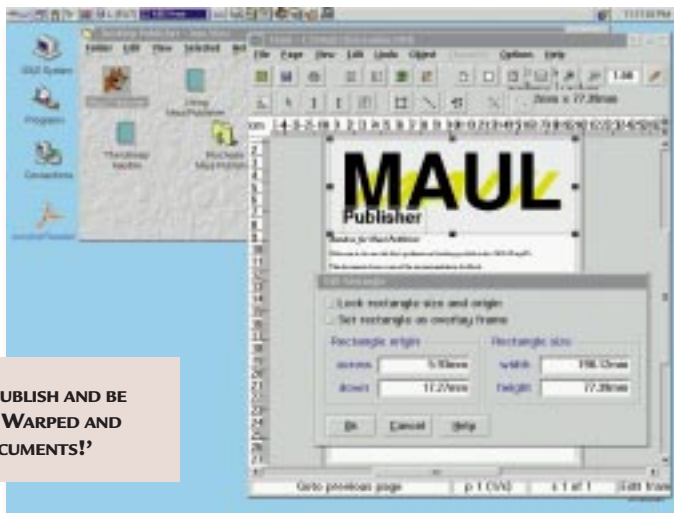
IBM research labs worldwide. The aim is to get emerging technologies out into the developer community and to gather feedback. If



◀ **ALPHAWORKS IS THE HOT SITE FROM IBM FOR COOL TECHNOLOGY SUCH AS TRANSCODING**

■ **Code pointers**  
Way back in June 1997, before the column's second birthday, Peter Koller sent me a diskette of OS/2 utilities, which were placed on the *Personal Computer World*

cover CD. Then, in May, Peter popped up again to say that he has produced the first ever DTP program specifically for OS/2, Maul Publisher. Check it out at



▶ **‘DON’T JUST PUBLISH AND BE DAMNED... GET WARPED AND MAUL YOUR DOCUMENTS!’**

[www.bmtmicro.com](http://www.bmtmicro.com) or on Peter’s website, La Maison des Anglais, at [www.manglais.claranet.fr](http://www.manglais.claranet.fr). However, I’m not entirely sure about the slogan that Peter appended to his email: ‘Don’t just publish and be damned... Get Warped and Maul your documents!’ It might benefit from a bit of polishing.

■ **Getting GUI**

Yet another GUI file manager, the Larsen Commander, is making its way towards version 1.0. This one’s for the folk who fondly recall Norton Commander. Now up to its eighth public release, version 0.98, you can find it at <http://home.sol.no/~leilarse/lcmd/index.html>.

■ **The fat lady has sung**

If you have been wondering what happened to the OS/2 version of the Opera browser mentioned in a previous column, the original project went bang. Now the program has been restarted by OS/2 Netlabs

<[www.netlabs.org](http://www.netlabs.org)> – a co-operative effort which also works on Project Odin, the effort to get Win32 code working on Warp.

The end result of all this, says Adrian Gschwend, the webmaster at OS/2 Netlabs, is that: ‘We’re no closer to an OS/2 port [of the Opera browser], but it means Project Odin (aka Win32-OS/2) is more important than ever.’

■ **Wheely useful**

Got a wheelmouse? You need SCROLLMS.EXE which you can download from the Device Driver Repository at <http://service.software.ibm.com/os2ddpak/index.htm>. This only works with the mouse plugged into a real PS/2 port (not with any adaptors and a serial port). Make sure your mouse is plugged into the PS/2 port and working under OS/2 Warp 3 or Warp 4



▲ **SNOWBLIND OPEN SOURCE FOR RIO MP3 PLAYER CONTROL FOR OS/2**

before installing SCROLLMS.EXE.

■ **Looks okay, sounds okay**

I’ve long wanted to do a round-up of audio/video support for Warp, but a lack of suitable hardware has prevented me from doing it. So, as a cheap alternative, here are several links to websites offering sound and video support. You can now get to the SoundBlaster AWE64 site from the Notebook/2 site at [www.os2ss.com/users/DrMartinus/notebook.htm](http://www.os2ss.com/users/DrMartinus/notebook.htm).

If you have a CD-R or CD-RW drive and want to use it under Warp, and you have \$248 (£155) to spare, try RSJ CDWriter from [www.rsj.de/stage/en/cd\\_os2.htm](http://www.rsj.de/stage/en/cd_os2.htm). A demo version can be downloaded from the website.

Proud owner of a Diamond Rio portable MP3 player? Want to use OS/2 as its host system? Look for the file RIO006-2.ZIP on Hobbes <<http://hobbes.nmsu.edu>>. This is an OS/2 port of the Ashpool Rio control program. More information about the program can be found at [www.world.co.uk/sba/rio.htm](http://www.world.co.uk/sba/rio.htm).

Owners of Hauppauge WinTV and Wincast PCI cards can go to [www.wdi.co.uk/os2tv/download.htm](http://www.wdi.co.uk/os2tv/download.htm) to download the Abbottsbury Software WinCast OS/2 driver.

T&V HappyPlayer works for TV cards built on the Brooktree BT848 chip. Find it at [www.os2.spb.ru/russian/projects/happyplayer/index\\_e.html](http://www.os2.spb.ru/russian/projects/happyplayer/index_e.html) under the name tvh\_xxx.zip. It’s PAL/SECAM only for now and has been tested with the AIMSlab Video Highway Xtreme, FlyVideo 98 and AVER TVPhone98 cards, but it should work with others too.

Still in beta, but it could be out by the time you read this, the MIDI Station Sequencer offers Digital Audio Sequencing using SEAL (no relation to the Monty Python musical mice sketch – I hope!), waveform editing, special effects, multi-track sequencing, and a rhythm editor. Download it from [www.dinosoft.it/~midistation/](http://www.dinosoft.it/~midistation/).

Looking for a music database? Have a look at MusicBase/2 ‘EarlyPreview’. Not all of the features are included yet, according to the author, and the preview version has a German interface <[www.warphouse.de](http://www.warphouse.de)>. We’re told that the released version will be in English.

■ **Last call**

We apologise for the absence of material on the cover CD. Last-minute changes by people in suits leaves us with no space for OS/2 stuff again this month. But watch this space!

**PCW CONTACTS**

Terence Green welcomes your feedback on the OS/2 column. Contact him via the PCW editorial office or email: [os2@pcw.co.uk](mailto:os2@pcw.co.uk)



# There's no place like Word

Tim Nott on Place Bars, Visual Keyboards, creating calendars and the SDI vs MDI debate.

**S**ometimes I don't know why I bother. In August's column I mentioned that I'd found a macro to customise the Place Bar in the Word 2000 File Open/Save dialog, but that it had time-expired. So I then explained how to do it with a spot of rather tedious registry meddling. Since then, Kris Lamer has kindly emailed to inform me that the Microsoft Office website now has the WOPR 2000 Place Bar Customiser available for download. So, it seems that someone at Microsoft now realises that customising the Place Bar is rather a useful feature. Perhaps they've been reading this column. But if you want to customise without getting your anorak muddy, then go to: <http://officeupdate.microsoft.com/downloadCatalog/dldWord.htm>.

While I was at the Office update site, I took the opportunity to download the Microsoft Visual Keyboard. Regular readers will know that multi-lingual typing is a regular topic in this column. Just to recap, the core TrueType fonts in Windows 95/98 do not just have the Western European character sets, but Greek, Cyrillic and Eastern European as well. Some fonts also have Arabic and Hebrew characters.

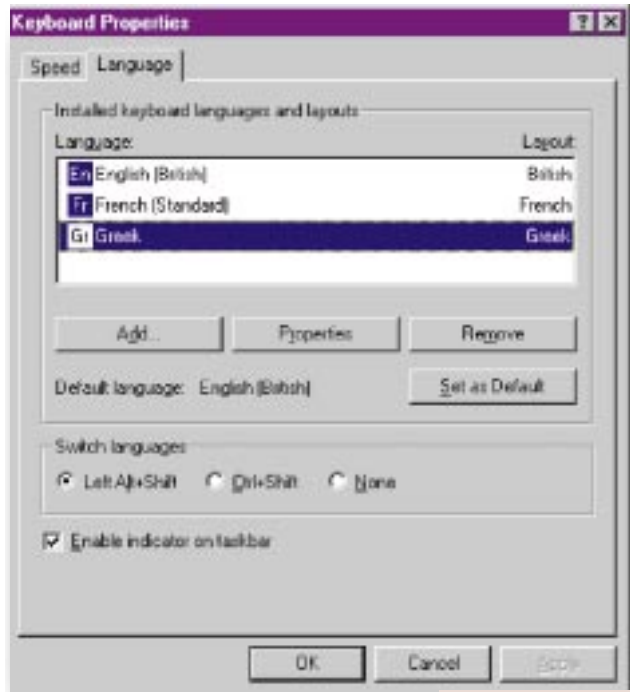
To gain access to these you can place them a character at a time from Word 97's Insert, Symbol menu. While this is fine for, say, putting the odd Pi in a maths treatise, it does make it rather tedious to quote chunks of Aristotle in the original. The other approach is to install the relevant Windows keyboard driver. Go to Control Panel, Keyboard, Language and you'll find you can add languages, and with the 'Enable Indicator' option ticked, switch between them when typing. You'll get a little icon by the Windows clock that pops up a list of available languages. This works in Word and WordPad, but I have yet to try it with any other word processors.

The only snag here is that having switched keyboard layouts, you can have

an exciting time guessing which characters are mapped where. In Greek, for example, Alpha and Beta are obligingly mapped to the letters A and B, but Omega and Theta take some finding. The Microsoft Visual Keyboard shows all the alphanumeric keys on screen, corresponding to the currently selected language and layout. You can either use this directly with the mouse, or as a map-to-keyboard input.

### ■ Creating calendars

I don't know if you ever have the need to create simple calendars, but reader Chris Kirby has created a useful macro that asks for a start date, a finish date, and the number of days per page. It then creates a table with the date and day in a narrow left-hand column, and plenty of space for writing in appointments or whatever in the right-hand column - all neatly formatted and ready to print out.



▲ ADDING LANGUAGES AND LAYOUTS TO YOUR KEYBOARD

### ■ SDI vs MDI

In August's column I asked if anyone out there liked the new single-document interface (SDI) in Word 2000. Much to my surprise, several people do. Thurston McDougle points out the advantage of the SDI when using multiple monitors. Andy Baker likes it on the grounds of elegant use of the taskbar, consistency with Internet Explorer, document-centred thinking and ease of use. Peter Johnson concedes that it helps inexperienced users who wonder where

▼ THE ALPHA AND OMEGA OF KEYBOARD UTILITIES

*It seems someone at Microsoft now realises the Place Bar is a useful feature*



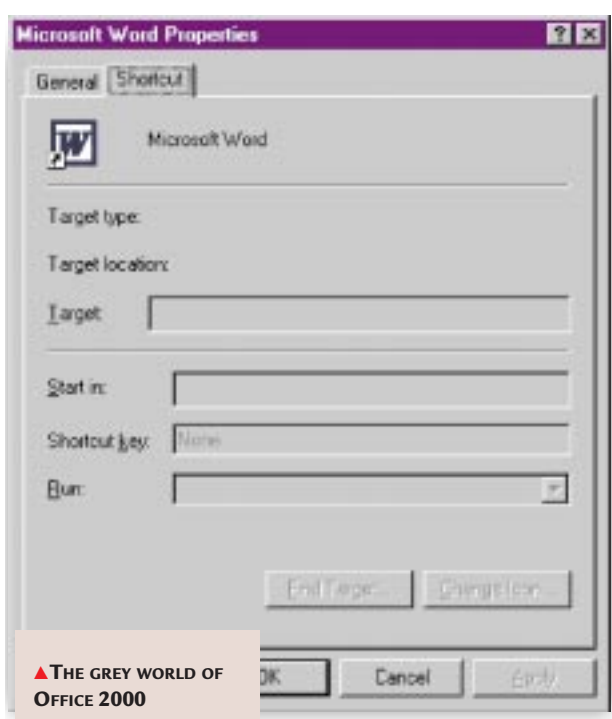
## Questions & answers

**Q** Having at last decided to upgrade from my trusty old version 2.0 of Word, I installed Word 97, but I was startled to find that my documents quadrupled in size. My new 6GB hard disk doesn't seem so big now. Looking at the files with Notepad, however, most of the extra seems to be empty space. Any ideas on how to keep files down to size? Is there an option I have failed to find?

JOHN NUTTALL

**a** First, bear in mind that, in general, application data-file sizes can only go up as new features are added. Second, you've skipped two generations, so the increase is going to be accentuated – though experimenting with some of my old Word 2 files shows a just-under-threelfold increase when saved in 97 format. Third, one reason that Word 97 files are substantially bigger than Word 7 and earlier, is because of Unicode support. Unicode characters, such as the euro symbol and the Greek character set, take two bytes per character rather than one. Finally, (and I quote a Microsoft spokesperson) Word files are 'mostly air'.

On a more positive note, file size needs to be taken in the context of disk cluster size. If the latter is 32KB, as with a 2MB hard disk partition formatted with FAT 16, then any file under that will take up the same amount of disk space.



▲ THE GREY WORLD OF OFFICE 2000 SHORTCUTS

Any file over 32KB, but under 64KB will occupy 64KB of disk, and so on. Two actions you can take to minimise file size are: to link, rather than embed, graphics files (particularly if the graphic is re-used in the same or other files); and to turn off 'Fast Saves' from the Tools, Options menu.

**Q** I've recently installed Office 2000, and noticed that the shortcut for Word that gets installed to the Start Menu has its properties either blank or greyed out – as are the other Office program shortcuts. This is a pain, as I've always used the /n switch for starting Word to avoid getting a blank document.

ROGER BECKNER

**a** I agree, and I too have always used the /n switch. Practically all my new documents are based on a template other than Normal.dot, so it's a nuisance to get a superfluous blank document when starting Word. The new-style shortcuts are necessary for the Install-On-Demand and Detect-And-Repair features of Office 2000, and route their commands via the Windows Installer. There is a way of customising these with the Custom Installation Wizard, which comes with the Office Resource Kit. A simpler method is to create new shortcuts by, for example, right-dragging Winword.exe on to the Desktop or Quicklaunch bar then selecting 'Create Shortcut here' You'll then be able to edit the properties as usual.

**Q** When I open a new blank page in Word 97 it is always in full page mode whereas I like to work in page width. Despite trying to save Normal.dot as I want it, I cannot make Word do what I want.

LASER BILL

**a** Word stores the view settings in two ways. The default view is stored in the Windows registry – or, in earlier versions of Word, in WINWORD.OPT. In addition, view settings are saved with each document. The settings saved in the registry are those current when Word was last closed. So the simple answer is to create a new, blank document, get the view settings the way you want them, then close Word. They should then 'stick' for the next Word session.

**Q** Can you tell me how to save values in Word envelope printing? I can change the position of the address on an envelope, but every time I print a new envelope the default 'auto' is back in place.

ROGER TERRY

**a** The best line of attack is to edit the Envelope Address style (Format, Style, List All Styles, Modify...). As well as being able to change the font and spacing, you can also redefine the indent and frame positioning. Make sure the 'Add to template' box is checked if you want the changes saved.

their work has gone when they open a second document over the first, but reckons it should be an option. Meanwhile, Mark Puddephat likes SDI as it lets him switch between documents using the Alt + Tab keys.

However, Mike Woods is a staunch multiple document interface (MDI) man. He suggests that Microsoft uses the taskbar to show just one Word icon, which pops up a list of open documents when clicked. I rather like that idea.

### PCW CONTACTS

Tim Nott welcomes your comments on the Word Processing column. Contact him via the PCW editorial office or email [wp@pcw.co.uk](mailto:wp@pcw.co.uk)



## Excelling at work

Stephen Wells says that the best way to summarise your Excel worksheets is with a PivotSheet.

**R**ichard Gowthorpe has recently emailed me with a question about summaries: 'I have 100 Excel 97 workbook files, each with 12 worksheets, one for each month of the year. Each worksheet has a list of names down column A and items across row 1. At the end of each workbook there is a summary of the worksheets with names down column A and months across row 1.'

'This summary of the sheets in the workbook is easy to produce using one formula in cell B2, which I can drag out across the table.'

'My problem is I need a summary of the 100 workbooks and when I drag out the initial formula it doesn't increment properly.'

**The answer to that**, Richard, is that Excel doesn't have enough information to complete the task. May I suggest you approach it in another way?

First, create your list as in Fig 1. Create a database field for each

piece of information: the names, the items, the months, and the data (I've used sales recorded in pounds). Don't total or summarise anything on this worksheet.

### *The beauty of PivotTables is that they summarise data in so many ways*

Now create a PivotTable. Just click in the list and choose Data, PivotTable

► **FIG 1** IT IS EASIER TO MAKE SUMMARIES OF DATA IN EXCEL IF YOU FIRST CREATE A LIST WHICH INCLUDES ALL OF THE INFORMATION YOU WILL NEED

	A	B	C	D
1	<b>Name</b>	<b>Item</b>	<b>Month</b>	<b>Sale</b>
2	Peter	A	Jan	110.10
3	Richard	B	Jan	65.10
4	Robert	C	Jan	95.10
5	Bill	D	Jan	150.10
6	Harry	E	Jan	25.10
7	Henry	F	Jan	85.10
8	Peter	B	Feb	25.00
9	Richard	C	Mar	150.00
10	Robert	D	Apr	95.00
11	Bill	E	May	65.00
12	Harry	F	Jun	85.00
13	Henry	G	Jan	110.00
14	Peter	C	Feb	65.30
15	Richard	D	Mar	65.30
16	Peter	A	Jan	76.06
17	Richard	B	Feb	74.86
18	Robert	C	Mar	73.65
19	Bill	D	Apr	72.45
20	Harry	E	May	71.25

Report, and then follow the directions of the PivotTable Wizard.

In Step 3 you'll find a button for each of your fields stacked on the right and places for them to go on the left. You can then drag the field names into the places of your choice. If you drag Name to Page, Item to Row, Month to Column and Sale to Data, you'll automatically produce the PivotTable shown in Fig 2. Then simply add your choice of formatting.

The figures shown are the totals for all the names. If

you want the results for just one person, pick the name from the automatically-created dropdown list of names.

The beauty of using a PivotTable is that you can summarise your data in so many different ways. And you don't have to create a single formula to produce the results.

#### ■ Running a macro

Trevor Birkett writes: 'I have some

experience of programming and have designed a user form and written code for the various controls on the form. But the only way I can activate the form is by going into the VBA editor to run it.

'There must be a simple way of activating the form from a button, but I cannot work out how.'

All you have to do, Trevor, is right-click on your button (or other drawn object). On the short menu choose Assign Macro. You have then assigned the button to your macro.

#### ■ Another year, another sheet

If you work regularly with databases, the chances are that you'll soon need to create some new worksheets with years across the top row - 2000, 2001 and so on. Here's a little macro for Excel that's easy to adapt to your needs. Open a new workbook and save it. Then press Alt + F11. In the drop-down box at the left of the toolbar, select Module. Then in the new window at the right of screen enter:

```
Sub SetUpTable()
ActiveSheet.Activate
For theYear = 1 To 5
Cells(1, theYear +
1).Value = 1999 + theYear
```

▼ **FIG 2 A** PIVOTTABLE PROVIDES SUMMARIES OF THE INFORMATION IN FIG 1 IN MANY DIFFERENT WAYS

	A	B	C	D	E	F	G	H	
1	<b>Name</b>	(All)							
2		(All)							
3	<b>Sum of Sale</b>	Bill							
4	<b>Item</b>	Harry							
5	A	Peter						£186.16	
6	B	Richard	99.86					£233.79	
7	C		132.93	223.65	61.62			£513.30	
8	D		150.10	131.73	167.45	60.41		£609.69	
9	E		90.33			136.25		£226.57	
10	F		85.10	64.02			155.04	£304.17	
11	G		110.00		62.82			£172.82	
12	<b>Grand Total</b>		£950.73	£296.81	£418.20	£229.07	£196.66	£155.04	£2,148.51

## Questions

### & answers

**Q** Is there a limit to the number of functions (like IF, MIN, SUM, and so on) which I can nest inside each other?

**a** In Excel yes, the limit is seven functions. But it's not a problem. Just break your formula down and put parts of it in different cells. Then refer to the cell addresses in your ultimate formula.

**Q** For my Excel invoicing worksheet, how can I

calculate the last day of next month?

**a** If you haven't done so already, install the Analysis ToolPak Add-In from your Excel or Office CD to make the EOMONTH function available. Then enter =EOMONTH(TODAY(),1). If the last argument is zero, it gives the last day of the current month. Minus 1 gives the last day of the previous month.

**Q** How can I define the title headers for a long Excel worksheet?

**a** Choose File, Page Set-up and the Sheet tab. Select

'Rows To Repeat At Top' and then, on the worksheet, highlight the row to use as titles. You can select multiple adjacent rows. You can also do the same for columns using the next option on that dialog box.

**Q** What's the fastest way of seeing a list of defined Names on an Excel worksheet?

**a** Actually, Names are used throughout the whole workbook. You can only use a Name once. But to see the defined Names, click the Name Box down arrow. This is to the left of the formula bar and by default displays the

address of the cell where the mouse cursor is – unless that individual cell has a Name.

**Q** How can I enter stock prices using fractions without having to paste in symbol characters?

**a** The easiest way is to just leave a space between the number and the fraction. If you enter 12 7/8, Excel will display that, providing you remember to include the space. If you want a fraction to appear on its own in the cell, enter 0 (space) 7/8, or Excel will assume that you want to display a date and show,

## THE WORD ABOUT OFFICE

Woody Leonhard is the publisher of *Woody's Office Watch*, the Microsoft Office information service available on email subscription, and Ed Bott is the senior editor of the US magazine *PC Computing*. Together they

have authored an encyclopaedic 1,500-page work covering all the applications in Office 2000.

Even though you may not have Excel 2000 yet, at £29.49 *Special Edition Using Microsoft Office 2000* is still good value, for two reasons.

First, the last major change in Excel was from Excel 95 to Excel 97. Excel 2000 includes extra help and online facilities, while the PivotTable features have also been

greatly improved. Apart from that, it's important to remember that any hints, tips, shortcuts, workarounds, and insights into Excel 2000 apply equally to Excel 97. Woody is the recognised source for this kind of information and this book is packed with it.

Second, the price includes a CD which has a complete searchable electronic copy of the book, plus special chapters from Ulrich and Blattner's book on Excel 2000, lots of clip art, a trial version of MS Project 98, Excel recovery software and other utilities.

At the time of writing, Computer Manuals is offering a discount, which makes the package even better value.



Click the floppy disk icon (Save) and close the whole VBA window. Back on the first worksheet, choose Tools, Macro, SetUpTable, Options. In the Shortcut Key box, enter a cap Y. Then close the Macro box.

If you click on your new worksheet and press Ctrl + Shift + Y, the macro will enter 2000 to 2004 in cells B1 to F1. Obviously to add more years, you can increase the number five in the third line of the macro.

Similarly, to change the starting year, substitute another year for 1999. To alter the font colour, use another RGB set. The first number is red, the second green, the third is blue. Hence the function name, RGB.

## PCW CONTACTS

Stephen Wells welcomes your comments on the Spreadsheets column. Contact him via the PCW editorial office or email: [spreadsheets@pcw.co.uk](mailto:spreadsheets@pcw.co.uk)

◆ Please do not send attached files unless they have been requested.

Computer Manuals can be found at <http://computer-manuals.co.uk>



# Solving mobility problems

Conflicts from having disconnected data on **mobile databases** can be resolved, says Mark Whitehorn

**W**e've been looking at mobile databases and the final area I'll cover is how to resolve conflicts which result from having disconnected data. I once wrote a 4,000-word paper on the different classes of error that can occur under these circumstances; it was rather stuffily entitled: *Supporting Data Integrity in the Mobile World*. I can either duplicate that here (which would, trust me, be very boring) or provide a few examples to give you the flavour.

Let's say a travelling salesperson finds a new customer and prepares to take the first order. On the server back at the office, there is a set of complex business rules that 'validates' a customer as acceptable. These rules involve processes such as connecting to a remote database and performing a credit check. The problem is that, at the PDA, we cannot get confirmation that the customer details are acceptable, although experience suggests that most customers pass the checks. So what can you do?

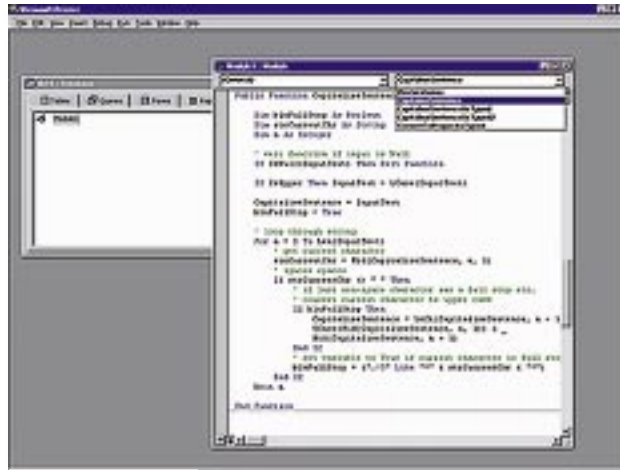
One answer is to split a transaction into separate stages. Salespeople are allowed to add a customer to the CUSTOMER table and take the order without the credit check. When the data is synchronised back to the server, the check is performed.

Only if a conflict occurs is the matter flagged back to the salesperson

the next day, perhaps instructing them to contact the customer and ask for payment before the goods can be delivered. The order can then be held until the payment is cleared. This solution requires that the RDBMS on the PDA is intelligent enough to implement these additional business rules.

As I say, there are lots of potential problems like this. However, when you look at them you discover that the solutions tend to concentrate on four main areas:

- ➔ Where the business rules are held
- ➔ Record vs field level uploads



▲FIG 1 KEN'S CODE IN A MODULE

➔ The way in which the data is partitioned

### ➔ Record vs field

Some systems detect which records have been edited on the PDA and move each edited record in its entirety to the server. Others move only the data from the specific fields in each record that has been edited. The latter sounds more sophisticated and leaner (less data moving around means faster uploads), but field-level uploads permit a range of new problems to become possible,

particularly when two people edit different parts of the same record. The optimistic way

of looking at this is that if you have control of the upload mechanism you can fine-tune the system to provide the results you want.

### ➔ The way the data is partitioned

'Replication' means that data from a database is stored and manipulated in more than one location (for example, on the server and on PDAs). 'Partitioning' means splitting the data up so that not all PDAs receive all of the data that is stored on the server. Render unto Caesar that which is Caesar's and unto the salesperson in the east, those sales

records which refer to the eastern region. Intelligent partitioning can reduce your synchronisation problems dramatically.

### ➔ Vendor tools

If the PDA, for example, is used to create new records, it is very helpful if the RDBMS engine on the PDA is capable of generating

primary key values that are guaranteed to be unique. Some do, some don't - it depends on what the vendor has provided.

Just like last month, there are no simple answers to these challenges; on the other hand the challenges are genuinely interesting. The most important tool you have is your common sense.

### ■ Some news is no news...

SQL Server for WinCE (Microsoft's answer to Oracle Lite, DB2e and so on) was announced at the WinCE developers' conference in Denver, but the details were horribly sketchy and no-one was willing to provide more. So I waited for Tech Ed and cornered Cynthia Sample who works on SQL Server in Seattle. She said that the first beta is expected in Q1 next year, and that the specifications for the product haven't even been frozen, so there really is no news as yet, we'll all have to wait and see. However, she did let slip that Microsoft is sensitive to accusations of 'software bloat' so the SQL Server team is very keen to keep it as trim and slim as possible. Whether they can get it under the 50KB of DB2e remains to be seen...

### ■ ...Other news is interesting

Did you know that IBM is the official 'Information Technology Supplier and Consultant' for the annual Wimbledon tennis championships? OK, maybe you



did. But you may not know that this year DB2 for Linux was employed on-site for 'the scoring and tabulation of the match statistics, complete with live scores, draws, completed matches, and player bios'. I knew some players were like machines, but I didn't know that any were fitted with a BIOS.

■ **Beware the politically autocorrect**

The following was sent in by the ever-helpful Ken Sheridan <KenSheridan@compuserve.com> and is worth knowing about. He writes: 'A contact used a structured primary key field in a table where one of the elements was a three-character group separated from the rest of the ID code by a space. One of the codes was ACN, but as soon as this was entered it became CAN. Setting the control's AutoCorrect property to False cured it.'

Until then I'd never thought about this property when designing forms and had always left it as the default of True, which is usually fine for free text fields, but could be disastrous in cases such as the one above. With a long string of characters I'll bet nine out of 10 people wouldn't even notice that two or three had changed.

■ **A capital idea**

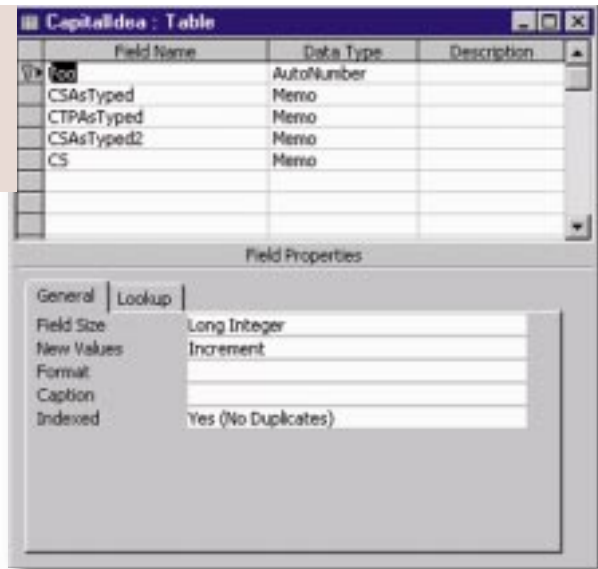
Ken is a regular contributor to the column and also sent the following advice: 'A while ago you published a function for capitalising characters as typed. Someone asked me if I could come up with a variation for capitalising the first letter of each sentence in

*I knew some players were machines, but I didn't know any were fitted with BIOS*

memo fields. To do this, try putting the code in a module and calling it from a control's KeyPress event handler [Fig 1].

It works pretty well but has one peculiar piece of behaviour I can't fathom at all. In some circumstances, when you are editing existing text, the first character of a sentence is only capitalised when the next full stop or space is entered. I can't for the life of me work out why. It makes no sense whatsoever, as the KeyAscii value should only be passed back to the current character, not one several places before it.'

Ken eventually sent four sections of code, together with more information, all of which will be on a forthcoming CD-ROM as a text file and are also included in a working Access 97 file - DBCNOV99.MDB. The first two have been linked to two memo fields.



Those who are so inclined can have a play and try to work out what is

wrong. I will admit to not having done so yet, I just cut and pasted the code and got it working. But it looks interesting.

■ **Working days**

Yes, this topic is still running, but this time one of the solutions is in Delphi. I'm always delighted to get solutions to problems produced in RDBMSs other than Access. Dave Albiston's solution will also be in the text file on a future CD-ROM.

Neville Kuyt came up with an alternative that

uses a table called calendar, which has two relevant columns: date and working\_day. Date is a date, and working\_day is a flag which is 1 if it is a working day, and 0 if otherwise. He includes code as well - wait for the text file. His solution is based on SQL Server but his approach is applicable to any RDBMS, including Access.

■ **A temporary home**

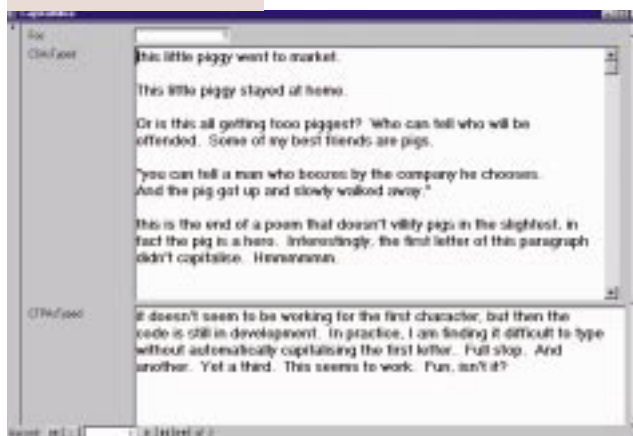
Most people are aware that splitting an Access database into two MDB files (one for the tables, the other for the forms, report, etc) is often a good idea. If you have multiple users, then the former can be placed on a file server and a copy of the latter can be stored on each user's machine. Even if the database is single-user, splitting can still be an advantage because you can tweak the interface without disturbing the data. It also means that the MDBs have a greater chance of staying small enough to transfer to floppy disk.

However, if your database uses temporary tables, there can be some advantage in splitting the database into three MDB files and placing the temporary tables in the third. The MDB file can then be compacted regularly, perhaps every time it is opened. This process should be much faster than if the same tables were in a folder with the data.

**PCW CONTACTS**

Mark Whitehorn welcomes your feedback on the Databases column. Contact him via the PCW editorial office, or email: [database@pcw.co.uk](mailto:database@pcw.co.uk)

▼ **ILLOGICAL: AT TIMES ONLY CERTAIN LETTERS GET CAPITALISED**





# Seeing the dots for the eyes

Gordon Laing stops your **head exploding** when trying to get the best out of your scanner.

**S**canning images has never been easier, with scanners incorporating automatic exposure, along with presets for colour and resolution settings. However, as anyone who is into photography knows, automatic settings may make life easier, but they're rarely foolproof. One day, sooner or later, an image will come along which demands a little manual intervention.

Once you've got your hands dirty, you'll also realise there's very little to it, and your results and satisfaction will improve by leaps and bounds. To coincide with this month's scanner group test, we've looked at how to get the most out of your scanner, particularly when it comes to capturing photographs for inkjet printing.

## Resolution basics

If you had to name just one scanner specification, it would have to be its resolution. Measured in dots per inch (dpi), this literally refers to the amount of fine detail that can be captured. Surely it makes most sense to shop for the scanner with the highest resolution, or perhaps match this number with the resolution of your printer?

Sadly, it's not that simple, and manufacturers rarely help by emblazoning often meaningless numbers on their advertising material, just to give an impression of quality.

The key figure to look out for is optical resolution, and this will typically be 300, 600 or 1,200dpi for an A4 flatbed. Most scanners, however, quote resolutions of over 2,400dpi, and some up to 9,600dpi. Reading the small print, these usually refer to interpolated figures.

**Interpolation** is a technique used to increase digital resolution by averaging adjacent values and inserting this new number in between. Let's say your digital file has a 10 and a 20 next to each other. Two times interpolation would average them both and typically insert the number 15 in the middle. Five times interpolation would insert the average numbers 12, 14, 16 and 18, significantly increasing the original resolution.



◀ HERE ARE THREE 3 X 2IN IMAGES, SCANNED AT DIFFERENT RESOLUTIONS: 300, 150 AND 75PPI, WITH RESULTING FILE SIZES OF 1.69MB, 432KB AND 108KB RESPECTIVELY – AT WHAT POINT CAN YOU TELL THE DIFFERENCE IN QUALITY?

salt and seek out genuine optical resolution.

## The optical resolution

of a flatbed scanner refers to the actual resolution of the imaging charge coupled device, or CCD. An A4 flatbed can capture a document eight inches wide, so an optical resolution of, say, 600dpi, would result in the CCD having 4,800 imaging sensors along its length. The CCD is fitted to a motorised conveyor, which passes it along the length of the document window.

By gearing this motor down, you can increase the vertical resolution and indeed many scanners are described as having

This is fine in theory, but in practice interpolation is guessing numbers that may never exist in the original. In scanning terms, it's inventing detail that was never captured. The final effect can be variable.

With simple graphic logos interpolation tends to work very well, usually smoothing the edges of predictable shapes and lettering. However, in colour photography it tends to have little to offer. It's always worth experimenting, but in general, take interpolated resolutions with a pinch of

600 x 1,200dpi optical resolution. Again, the first figure is the one you should be looking at most closely. You can gear the motors to infinity, but they're of little use if the CCD isn't keeping up.

## Which resolution?

If you've splashed out on a 600 or even 1,200dpi scanner, it's tempting to use its highest optical resolution settings – you've paid for them after all. However, this is rarely necessary. When choosing a scanning resolution you only need to know three things: the size of the original

image, the size you'd like it to end up, and the properties of your printer.

Starting with the third, it's worth running a few quick tests on your printer to see how many scanned dots it can actually make use of. A typical colour inkjet may be described as having 720 or even 1,440 dots of resolution, but in reality, these dots can only ever be one of a few tens or hundreds of different colours. Your scanner, however, is producing genuine full-colour dots, in potentially millions of different shades.

In order to simulate these full-colour scanner dots, a printer has to put several different dots of ink very closely together. When viewed from a distance, they appear to blend into one. Just look closely at any magazine and you will see how smooth multi-colour images are actually made up of a handful of coloured dots printed at different sizes.

**So perhaps it's best** to reconsider the ambiguous dpi rating. Printers genuinely deal with dots, so they can stick with it, but scanners should be described as having resolutions measured in pixels per inch (ppi). Many upmarket models already use this terminology. But if a printer needs to use many of its 720 or 1,440 dots to simulate just one coloured scanner pixel, what scanning resolution should you use?

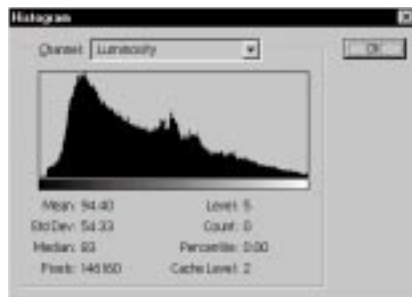
The answer lies in experimentation. Make a 600ppi scan of a photo, and print it. Now make a 300ppi scan of the same photo and print that. Repeat with lower and lower resolutions until you begin to see pixellation on the output.

In our tests, we've found that most colour inkjet printers don't know what to do with more than between 150 and 200ppi scans for photographic output. Try it yourself and once you can't see any improvement with higher scanning resolutions, stop and remember the

## ***With most online images you can get away with very low scanner settings***

setting. Scanning at unnecessarily high resolutions will produce large unwieldy files that swallow storage and take ages to print, with no increase in quality.

If you only need to supply, say, 150 pixels per printed inch, why bother buying a 600ppi scanner at all? The answer lies in resizing and the first two



▲ **A FAIRLY WELL-EXPOSED SCAN, WITH THE HISTOGRAM REVEALING AN ALMOST COMPLETE RANGE OF TONES, WITH ONLY THE DARKEST SHADOWS MISSING**

measurements we mentioned. Let's say you have a 6 x 4in print, which you want to scan and output at the same size. In this instance, scan at 150ppi. However, if you want to double its printed size to 12 x 8in you'll need to double the scanning resolution to 300ppi. Similarly, if you only want to output it half its original size, halve the scanning resolution to 75ppi.

**Clearly, high scanning** resolutions are only of use when making big enlargements. Consider a 35mm transparency, measuring only an inch high. With a 600ppi setting, you'd still only be able to enlarge it four times to 4in high. That's why dedicated 35mm film scanners concentrate all their imaging sensors across only one inch, and therefore typically boast resolutions of 2,700ppi.

Then again, flatbed owners could

always employ interpolation to eliminate the jagged pixellation – although again, remember this will only smooth the image and not increase detail.

A quick note to web publishers: your output device is a monitor, typically running at around 75ppi. Since most online images are rarely bigger than a couple of inches across, you can get away with very low scanner settings.

**Finally**, another note on image scaling. Most scanner drivers have a resolution and a scaling percentage setting. The tips above apply with the scaling left at 100 per cent. You could achieve the same result by leaving the resolution at your output device's desired setting (for example, 150ppi for an inkjet or 75ppi for web publishing) and then adjusting the scaling setting to work out the rest.

Using a resolution of 150ppi at a scaling of 50 per cent produces the same quality file as a resolution of 75ppi at 100 per cent. Since scaling works with the physical input and output dimensions, it's often a better route to take as there'll be no nasty surprises when it comes to printing. A 35mm film scan at 2,700ppi may have the potential to become an A3 poster, but if you don't scale it for output, then you'll still only end up with a print one-inch high.

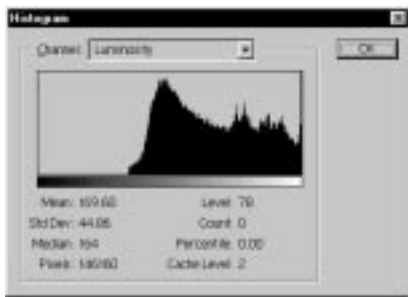
### ■ **Colour and tone**

The second most important scanner setting refers to its tonal range. This is normally left at automatic, but a little manual tweaking here and there at the scanning stage can make a world of difference to your final image quality.

The idea is for you and the scanner to agree on what is pure black and what is pure white. Too much of one results in clipping, with areas of lost detail in bright highlight and dark shadow. Too much of the other could again result in reduced detail and undesirable banding in smooth graduations.

The trick is to know what kind of tonal range your scanner is capable of capturing, and to recognise what are known as black and white points on your image.

**The best place to start** is with an existing scan. Open it in any image manipulation package, such as PaintShop Pro or Adobe PhotoShop and check out its histogram. The histogram is a graph, which shows the distribution



▲ AN OVER-EXPOSED SCAN SHOWS A RIGHT-SHIFT OF THE TONES IN THE HISTOGRAM – NOTE THE LACK OF ANY MID OR SHADOW TONES, AND CLIPPING IN THE HIGHLIGHTS

of tones in an image. On the far left is pure black, on the far right (typically 256 steps later) is pure white, and in the middle are all the shades in between. For colour images you can look at the red, green and blue channels individually, or together as a mixed grey representation.

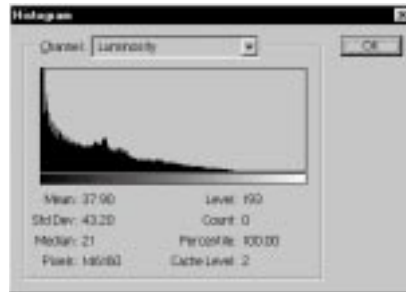
The histogram takes each tone level at a time and vertically plots the number of pixels in the image at that point; if the image is a pure black square you'd just get a tall line at the zero point on the far left-hand side.

Typically, a histogram for a colour photo looks like a wavy line, and there are warning signals to watch for. First, check where the wavy line falls down to the zero count at both ends – ideally, it should just peter out as close to the left and right extremes as possible. Where it falls short on the left and right is an indication of lack of detail in the shadow and highlight regions respectively. Any areas where it is cut short indicates clipping and again lost detail at that side.

Histograms also give a good general indication of over- and under-exposure, with the bulk of the pixels concentrated to the left and right sides respectively. Any gaps literally reveal tonal areas which have not been captured. These, of course, may never have existed in the original picture, but it's worth a check.

**Now you can start** adjusting brightness and contrast to shift the tonal values – or better, use the automatic level controls to stretch a shortened histogram chart to reach both edges.

Be warned, every tonal manipulation you make post-scanning results in lost quality. Stretching levels may mean that you now have pure whites and blacks, but by doing so, you may have lost some



▲ AN UNDER-EXPOSED SCAN SHOWS A LEFT-SHIFT OF TONES IN THE HISTOGRAM – NOTE THE LACK OF ANY HIGHLIGHT TONES AND CLIPPING IN THE SHADOWS

in-between greys. Each time you make a post-scan adjustment you lose precious pieces of information. Modern 30bit or 36bit scanners may have information spare for adjustment and still end up

with a good 24 bits for printing, but the trick is to identify any problems and fix them before actually making the final scan.

Most decent scanner drivers offer histogram analysis, along with level correction, brightness and contrast controls and adjustable tone curves. They should also allow manual eyedropper selection of desired white and black points on the preview scan window.

Always try to optimise your image at this pre-scan point and the scanner will then throw its entire resources in the direction you're after. For instance, if you find your particular printer makes everything too dark, compensate for it before scanning, and you'll get better output as a result.

### ■ Advanced settings

It's worth having a quick word on scanning from magazines, books and newspapers. If you look closely at their printing process, you'll see all the shades have already been turned into lots of different-sized dots. The problem comes when you scan them, particularly for later reprinting.

Your printing process will also try to simulate shades with lots of dots and that's where the confusion begins. The result of scanning and printing something that's already been printed using this 'halftoning' technique is an undesirable, patchy effect called *moiré*.

**Ideally, always scan** original photographs, but if you must scan an already halftoned image, use the scanner driver's descreening tool which eliminates *moiré* with various degrees of success. Make sure you know the 'screen' value of the magazine, book or newspaper, and feed this into the descreening option. Typically, newspapers will be screened at 75 lines per inch (lpi), while a high-quality art book will be 150lpi; PCW is screened at 133lpi. If you do descreen, be aware the scan will take much longer and, most importantly, ensure you deactivate the setting when scanning normal images again.

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# Filter, synth and distort

## Steven Helstrip moves to North Pole to mix tracks

Over the next few months I'm going to be writing about some of the techniques I use regularly when producing my own music and remixes for other artists. The tips and tricks are in no particular order, but nonetheless they should give you a few ideas to try out on your own productions.

Although I've steered clear of mentioning my own releases since starting this column some five years ago (blimey, has it really been that long?) I think a small plug is justified at this point so you can hear how these techniques have been applied. For those who are interested, I work under the guise of *The Thrillseekers* and you can hear my latest tune *Synaesthesia* on both the Ministry of Sound's *Ibiza Anthems* and *Gatecrasher Wet* compilations. If you can borrow a copy of either from one of your mates, I'd welcome any feedback. Don't forget, this is your column as much as mine, so any tips you have are always welcome for publication.

### ■ Plug it in

With so many high-quality plug-ins available for little or no outlay via the Internet, we're going to start by looking at some creative ways of using them. One of my favourite effects right now is Prosoniq's North Pole filter [Fig 1]. If you haven't got it, I'd highly recommend you pay a visit to [www.prosoniq.com](http://www.prosoniq.com) and take advantage of the free download.

The effect is described as a virtual analog synthesiser filter. It works inside any VST-compatible application and sounds just wonderful.

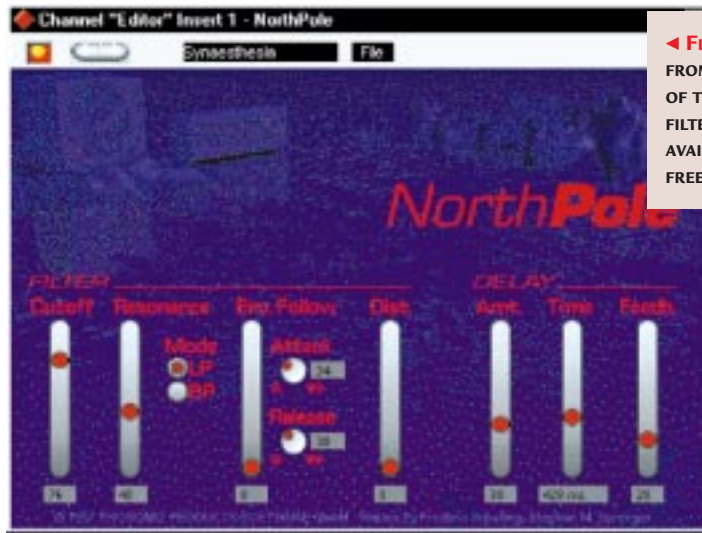
Many synths and sound cards have built-in filter effects, but they often have a harsh, digital quality to them. Sometimes this will be exactly what is needed, but if you're looking for a warm,

rich sound, I suggest you give North Pole a try. Before recording the part into your sequencer, ensure the synth's filter is fully open; this will give the plug-in more frequency content to play with. Usually,

the effect is best used as an insert. This approach ensures only the

output from the filter is heard, rather than a mix of the effect and the original, dry signal.

As a starting point, kill the resonance, set the cut-off to 99 (fully open) and turn the envelope follower right down. If you want to use the post-filter delay, set this up accordingly. You can work out the exact time in milliseconds for this by dividing 60 by the



◀ **FIG 1** NORTH POLE FROM PROSONIQ IS ONE OF THE BEST-SOUNDING FILTER PLUG-INS AVAILABLE. AND IT'S FREE TO DOWNLOAD

tempo of your track. Now we're set.

Start by looping, for example, an eight-bar section of your synth line and have a good fiddle with the

frequency cut-off. Increasing the resonance will produce rich harmonics around the cut-off frequency point.

Your synth line should be sounding more lively already, but we've only just begun. The envelope follower, when switched in, tracks the input level of the signal to filter cut-off. This creates a kind of 'wah-wah' effect. Adjusting the attack and release parameters determines how quickly the filter is opened and closed. Experimentation is the key, so don't be afraid to try extreme settings, however outrageous they may seem.

**Synth lines are one thing**, but North Pole works a treat on practically anything you throw at it - everything from basses through to returns from other effects.



▶ **FIG 2** SETTING UP A GROUP TRACK IN CUBASE

## Questions & answers

**Q** I read your piece on burning audio CDs (June 1999, *Do the write thing*) with some enthusiasm, as I have so far had no luck with my own set-up. The problem is this: although I can hear sound coming into my PC via the line input, when I try to record it I get nothing. I've tried Wavelab, Wave Studio and Sound Recorder. What am I doing wrong?

TIM STARK

**a** With some sound cards (including the Live!) you need to select which input you want to record from. Although you can hear sound coming in, your card is probably set up to record the CD audio channel.

It's not obvious at first but this setting can be changed via the Windows mixer applet. Go to Properties, select Recording and click OK. The mixer should now display the input channels (as opposed to monitor channels) available. Simply select line in.

**Q** I have recently bought a SoundBlaster Live! Value card to replace my old AWE32. I must say that although the Live! Value is very powerful, some games still don't work well with the SB16 emulation.

I thought I would have a go at re-installing the AWE32 alongside my Live! Value, but before messing things up I wanted to ask you if there's any risk of hardware conflicts or other problems.

BRYAN GRECH

**a** Installing two sound cards in a PC used to be fraught with problems, but since plug-and-play came on the scene there isn't much that can go wrong.

However, since the AWE32 isn't a true plug-and-play device, I would first get it up and running in your system without the Live! Value card. Once you have done this, pop the Live! card back in. All being well, plug-and-play should then assign the card to whatever resources are left free.

► **FIG 3 RECORDING FILTER AUTOMATION IN CUBASE**



We'll be looking at this subject more closely in a future column, but until then you may want to try some of the following ideas.

One of the parameters I haven't touched upon yet is distortion. This can work particularly well on a vocal, giving it that 'Underworld' sound which you may remember from the track *Born Slippy* in *Trainspotting*. Combine distortion with the envelope follower and you can produce some truly amazing results. This is particularly useful if, like me, you can't sing that well - everyone sounds roughly the same when treated in this way!

**Combine distortion with the envelope follower and you can get some amazing results**

Returning to the synth idea, it can be really effective to have your part playing on two tracks, each with different moving filters. Panning them to opposite speakers will invariably help to keep your mix sounding clean. However, if there's just too much going on, you may need to

delay, or offset, one of the tracks between 10ms and 20ms. This technique creates a wide stereo image and works equally well, for example, on hi-hats as it does on backing vocals.

**■ In full effect**

Using a filter on your finished two-track mix, or sub-groups within it, might appear a tad over the top. But if Norman Cook (aka Fat Boy Slim, among other things) can get away with it, so can you.

So, how do you go about it? First we'll deal with grouping, which involves processing two or more tracks with one effect. Although I'm using Cubase in the

following examples, the principles are the same for whatever sequencer you have.

You can send any track to a group by clicking in the output field below the track channel, as shown in Fig 2. The output from that channel will now appear from the selected group return. These are coloured blue to distinguish them from standard channels. Since any number of tracks can be routed to a group, they can be processed together using a group insert. These are set up in the same way as standard mixer channels.

**The best way to handle** filtering the overall mix is to first create a two-track master (see June's Sound column, *Do the write thing*). Load this into a new arrangement and configure an insert in the normal way.

To record your filter movements, simply enable the Write button on the mixer [Fig 3]. Then, when the track plays, all the parameters you tweak will be recorded to a special mix track. If you make a mistake, just snip out the bar containing the error and have another go. To play back the automation, you'll need to enable the Read button, which is just below the Write button.

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# Compose yourself

Benjamin Woolley proves that a **little film theory** goes a long way with 3D animations.

**L**ast month I looked at some of the basic features of the virtual camera (the object used in 3D graphics software to determine the point of view from which a scene is rendered). This month I shall look at how you can exploit some of those features.

The most common practice when creating a 3D project is to build up the scene and then plonk a camera somewhere inside it for the final render. What you should really be doing is pretty much the opposite. The scene should be regarded as a collection of objects arranged for the benefit of the camera. 'Frame composition' – how you arrange those objects to produce the desired effect when it is 'filmed' (ie rendered) by the camera – is crucial to a project's success and it should be taken into consideration from the beginning.

**There is no hard and fast theory** for determining how scenes should be composed, but there are issues worth focusing on from the beginning of a project that might help. First, you have to establish what the scene is for: what do you want the viewer to experience when they look at the image or animation?

Let's take some examples from drama to explore this idea. In most drama scenes, you are concerned with one or more characters (which could be human, mechanical, alien or whatever). You want to establish the relationship these characters have to their location and to each other.

**If you want to emphasise** a character's relationship with its location, you would tend to use a wide, static shot. Imagine a car driving along a road [Fig 1]. The car is the main character in the scene and you need to suggest, through its position and movement, why the audience should be interested in it. Placed on its own in the middle of an open landscape, far away from the camera, it looks tiny – suggesting isolation and vulnerability.



In fact, the audience might not notice it at all. However, in an animated version of this scene the car is the only moving object so attention is immediately drawn to it. Of course, you can only achieve this effect if the camera remains locked off, that is, if it isn't animated. The camera in Fig 1 is set high up, but this position seems acceptable, as it is possible to imagine a human having this vantage point if they are standing on one of the surrounding hills.

Being so far away, the audience will probably feel little concern for the car – it is just a curiosity – an ant crawling across

**How you arrange objects to produce the desired effect is crucial to a project's success**

the desert sand. But it is approaching in our direction, which hints that we are about to become more engaged with it, that it is entering the story. You could achieve the reverse effect (at the end of a film, for example) by having it drive off in the opposite direction.

**Of course, this is just one way** of introducing the car. An alternative might be a tracking shot, with the camera fixed alongside the car and following as it drives along the road. This emphasises the audience's engagement with the car

**▲ Fig 1** THE LONG AND WINDING ROAD – A WIDE SHOT OF A DISTANT CAR EMPHASISES ITS REMOTENESS AND ITS RELATIONSHIP WITH THE SETTING. THE IMAGE WAS CREATED USING 3D STUDIO MAX AND BRYCE

but plays down the importance of the surroundings, which are just a blur in the background.

Another way to increase the audience's sense of engagement with the main character is to put as few objects as possible between the viewer and the character. If you wanted to introduce a note of alienation, perhaps because you do not want the audience to identify with the main character, you could introduce some sort of foreground action (for example, in the case of our car, a railway track running perpendicular to the road, with a train trundling along it).

If there are a number of characters in the scene and you want to emphasise their engagement with each other, you would want them all to appear close to one another, which could be done using a long – rather than wide-angle – lens, which reduces the depth of field. You might also use more close-ups. A series of close-ups unrelieved by intercutting with mid or wide shots would increase the sense of engagement – if you framed the characters in the picture so that parts of them were cropped (off-picture) you might even start to create a sense of claustrophobia.



2a



2b



2c

▲ **FIG 2 BOMBS AWAY – A DEMONSTRATION OF THE POWER OF THE PLUG-IN BY 3D ARTIST DEAN SCOTT**

are names you would expect in such a list, the mainstream professional packages Lightwave and 3D Studio MAX. But another name has now

you are panning with the lens on a long zoom setting, you will have to go even slower, unless you want a 'whip-pan' effect, in which everything becomes a blur – a technique often used in film and

joined the list, one which brings the power of plug-ins developed for professional graphics houses within the reach of a much wider range of users: Truespace. Caligari has a list of plug-ins that will work with Truespace 4 <[www.caligari.com/tsx/tsx\\_plugins98.htm](http://www.caligari.com/tsx/tsx_plugins98.htm)> and it is impressive.

The extraordinary images in Fig 2 of a nuclear explosion were generated by 3D artist Dean Scott <[www.tir.com/~dscott](http://www.tir.com/~dscott)> using a powerful procedural texturing plug-in called DarkTree from Darkling Simulations <[www.darksim.com](http://www.darksim.com)>. The 3D package he used was Lightwave 5.5, but a Truespace 4 version of DarkTree should be available by the time you read this.

There are now innumerable plug-ins, not just for textures but for all sorts of specialist effects. The problem is that they can be expensive – DarkTree is relatively cheap at \$270 (£169) – and can also be difficult to get hold of, so you will probably have to order them online from America. However, recognising that its users are unlikely to be able to afford the prices that MAX and Lightwave users can, Caligari has recently launched a useful collection of plug-ins called Pluspacks, with a list price of £99.

Much of the above assumes a fixed point of view. But one of the great advantages of the virtual camera is that you can animate it. The simplest movements are those of the camera head and lens: pans, tilts, rolls and zooms. Tilts (up and down) and rolls (twisting so that the horizon is no longer horizontal) increase a sense of disorientation and are rarely used. Pans and zooms are more common and to make them work you have to get the speed right. The temptation is often to make them too abrupt. In *Inside 3D Studio MAX* (New Riders, £49.95), the authors (who can usually be relied upon about such matters) suggest that in an animation running at 30 frames per second (fps) you should allow 22 frames for a quick pan of 45 degrees. For a more gentle turn they suggest three times as long: 66 frames. If

TV as a transition device to denote a jump to another time or location.

Moving the whole camera (tracking) opens up a host of new possibilities – and complications. In general, fast, sweeping, roller-coaster camera movements are one of the signature features of computer-generated imagery, as they are so difficult to achieve in the real world. I'll take a look at how to set them up next month.

■ **A plug for plug-ins**

Nearly all 3D graphics packages boast of having an 'extensible architecture', that is, they can use plug-ins from other companies to add features. Adobe popularised this

***Establish what the scene is for: what do you want the viewer to experience?***

idea but it is now almost universal in the graphics field. The trouble is that some packages are not as well supported as others. Three have now emerged as offering a reasonably wide choice. Two

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# A view to assist

**Tim Anderson finds that vsView is reaping the rewards of Microsoft's work on web development.**

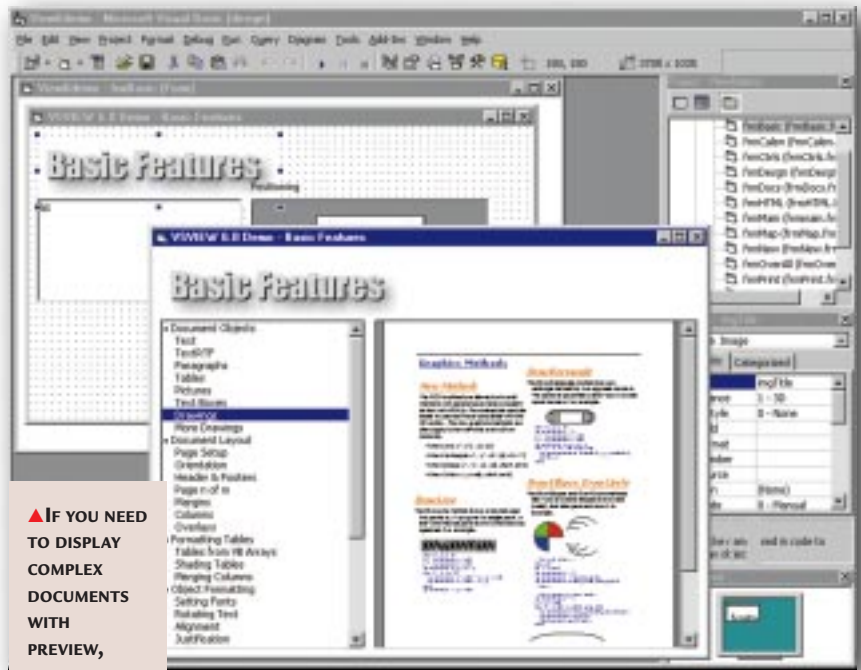
**M**icrosoft's efforts to conquer the web have had spin-off benefits for Visual Basic (VB) users. Before the web, most ActiveX controls used MFC (Microsoft Foundation Classes), and depended on the large MFC runtime files. To have any chance on the web, ActiveX controls needed to get slimmer, so Microsoft came up with ATL (the Active Template Library), which lets you easily build ActiveX controls without using MFC. My hunch is that Videosoft has used this technique for version 6.0 of vsView, which is said to be twice as fast as the previous version and free of MFC dependencies.

There are three controls in vsView: vsPrinter, vsDraw and vsViewPort. They are intended to address a common VB problem: where you have some data which you want to present formatted nicely with, for example, a chart, a table, and some explanatory text. Traditional report writers are great at presenting huge lists of records with groups and summaries, but can be inflexible when you want to present data in other ways. Another option is to use Word and Excel by automation, but this is a heavyweight and expensive solution.

***vsView is said to be twice as fast as the last version and free of MFC dependencies***

**The more efficient approach** is to print directly to a form or picture box for the screen, and the printer object for paper output, which gives complete control at the expense of additional coding effort. Unfortunately, it also means a do-it-yourself approach to things like margins, page breaks and headers and footers.

If any of this strikes a chord with you, you probably need vsView, which



**▲ IF YOU NEED TO DISPLAY COMPLEX DOCUMENTS WITH PREVIEW, PRINTING, AND EXPORT TO HTML, vsVIEW IS THE IDEAL SOLUTION**

provides the excellent vsPrinter control. This control is a canvas on which you can output your data using the Text property, along with methods like DrawPicture, DrawLine and AddTable. The Text property in vsPrinter behaves more like a method, and simply prints at the current position without deleting any existing text. Unlike VB's printer object, vsPrinter is a visible control that gives you instant print preview, as well as a built-in printing capability. It includes support for headers and footers,

multiple columns, rich text format, tables, page numbers and export to HTML. The SaveDoc and LoadDoc methods allow you to paste the current document to a file and load it back later. There is also an Append option to let you add a document to the end of an existing one rather than replacing it.

The HTML option, new in this version, is significant. You need to bear in mind that a vsPrinter document is essentially a metafile graphic, not a word

processor document. In previous versions, if your users wanted an export facility, for example to Word or Excel, you would have to write custom code to regenerate the report in another format.

**Now you can have vsPrinter** build up an HTML document on the fly, so that when you call the EndDoc method to tell vsPrinter to render its content, either as a preview or direct to the printer, it will also create an HTML version on disk. Because HTML is widely understood, it gives you an immediate document file that can be imported by other applications or, of course, published to the web. There cannot be a perfect match between the HTML and the native vsPrinter version, because the formats are fundamentally different, but it is still a useful option. A snag is that although tables are exported, graphic objects are not. You can overcome this by inserting your own HTML snippets into the document as it is being created.

Two other controls are bundled with vsPrinter. The vsDraw control lets you build up standard Windows metafiles, which you can print, save in .WMF format, or add to vsPrinter documents. Next, vsViewPort is a scrolling container

to handle forms that are larger than the view area. The bundle also contains vsDataLabeler and vsDataReporter, components built with vsView and vsFlexGrid and compiled as ActiveX DLLs. These components let you easily add label printing and ad-hoc reporting to an application, using ODBC or OLEDB data sources. Overall this is a great package, which will save a huge amount of time if you need this kind of custom presentation.

■ **CodeAssist**

Unlike most of Sheridan's products, CodeAssist is not a VB add-in or an ActiveX control, but a standalone code generator. It is based on the fact that most developers spend a lot of their time writing tedious and repetitive code. In particular, if you are writing a database application, you probably spend time declaring variables to match field names, writing code that builds up SQL commands, or building a Visual Basic class module - which includes private variables, Property Let and Property Set procedures.

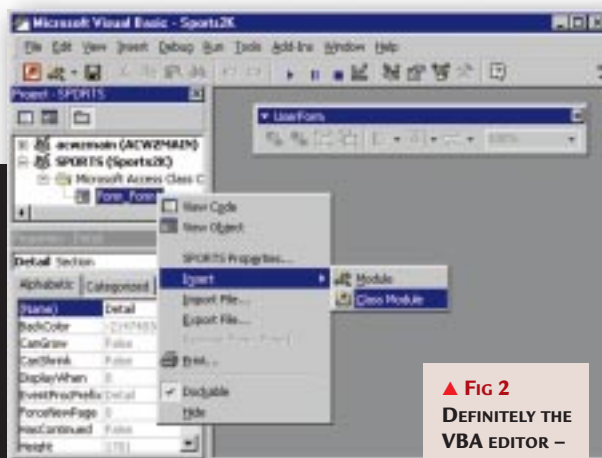


The next step is to open a database connection in CodeAssist, select a data object such as a table or query, and choose the code template you want to use.

In other words, CodeAssist replaces template fields like %FLD\_NAME% with the actual field names from the chosen data object. Initially, this may seem like no big deal, but in fact the productivity benefits are considerable. For example, you might have a database with 40 tables, where you need to create a VB class module for each one. With CodeAssist this is the work of a few moments, and prevents spelling errors or omitted fields. The advantage of the template-based approach is that you can decide exactly what goes into the

▼ **CODEASSIST COULD SAVE YOU HOURS OF WRITING REPETITIVE DATA ACCESS CODE**

generated code, unlike most data wizards that make assumptions about



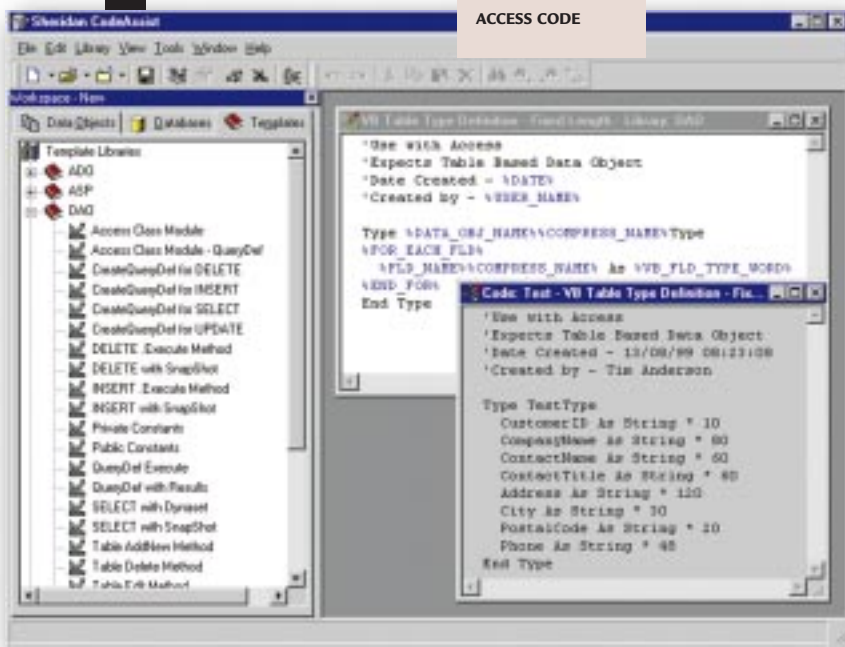
▲ **FIG 2 DEFINITELY THE VBA EDITOR - BUT WHERE IS INSERT FORM?**

how you want to do data access. CodeAssist is language-independent (in that you can tailor the templates for any language) and comes with hundreds of pre-built templates for VB, Delphi, C, ASP (Active Server Pages), ISAPI (Internet Server Application Program Interface) and others. It is less flexible about database connections, supporting only Access and Microsoft SQL Server. A free update will add support for Oracle 8 and Sybase SQL Server, and will also run as a VB add-in if required. The package is well-designed, and worth considering if you do a lot of database coding.

■ **Fun with Internet Explorer**

This one is easy. A little-used feature of Internet Explorer 5.0 lets you convert a web page into an application. Open up Notepad, and make a simple Dynamic HTML page, for example with a button and an on-click event handler. Save it with a .HTA extension and double-click to run it. This opens the page, but in a traditional application window rather than in a browser. You can add an <HTA:APPLICATION> tag that gives options to set caption, application name, icon, window appearance, and more. HTML applications (HTAs) have special features. One is that all security is turned off, unless you include a frame that accesses web pages from elsewhere. This means that HTAs have read-write access to files on the client machine, and can run scripts, ActiveX controls and Java applets without restriction.

As the web development model slowly takes over software development, the ability to present web pages as Windows applications may prove useful.







# Singing translucent blues

Cliff Joseph found that there was more to life than **Apple's iBook** at this year's MacWorld Expo.

**A**pple's iBook may have stolen the show at this year's MacWorld Expo, but there were quite a few other announcements that were worth a mention. The most noticeable thing at the Expo was the vast amount of translucent-blue plastic on show at various stands. It seems like just about every peripherals manufacturer in the world was showing off iMac-style versions of their printers, scanners, mice, and assorted USB adaptor doodahs.

Pushing through such ethereal matters was the announcement that both Epson and Canon were preparing to launch multi-function systems, which combine printer, copier and fax machines in a single USB device. A few months ago products like these would have been Windows-only, but their Expo appearance is a sign that peripherals manufacturers are backing Apple again.

**There were quite a few** other USB devices floating around as well. At long last, the Mac is getting some reasonably affordable CD-RW drives, including ones from Sony, QPS and Mitsumi. QPS also came out with the first DVD-RAM drive for the Mac, complete with ghastly blue-

translucent casing. Entrega finally produced Mac versions of some of its USB adaptors, including a handy USB-to-SCSI adaptor and a multi-port hub that provides USB, serial and SCSI ports.

**Surprisingly, there** weren't many major software releases on show. Adobe was demonstrating InDesign – as it has been for about the last six months – but the software still wasn't finished and on sale. Even so, arch-rival Quark seems to be sulking over the prospect of actually having some real competition for XPress, and was noticeable by its absence.

**On the emulation front,** Connectix showed a new version of Virtual PC. The good news is that it supports USB. The bad news is that it doesn't support the 3D acceleration in the ATI Rage 128, which ships in the current range of G3 Power Macs. The problem, apparently, is that the Rage 128 provides both 2D and 3D acceleration in a single card. This means that there's no way to separate

the 2D and 3D functions so that Virtual PC can make use of the 3D acceleration while leaving the 2D part of the card for the Mac operating system.

This means that you'll need to have a separate 3D card, such as a Voodoo 2 card, if you want to use Virtual PC to play games. Virtual PC 3.0 won't support Voodoo 3 cards, though, which is a shame as the first Mac-oriented Voodoo 3 cards were on show from Macally and IX Micro.

Connectix didn't have the monopoly on emulation software. A company called

Emulators Inc surprised people with a new version of Gemulator. This is a Mac emulator that allows PCs to run the Mac operating system. It's been available for a while, but earlier versions were very slow and only ran 7.x versions of the MacOS. The new version can run OS 8, but only emulates a Motorola 68040 processor.

**However, my vote** for best software release at the Expo goes to Unreal Tournament. The developers at MacSoft, which produced the Mac version of Unreal Tournament, told us that their main problem in finishing the game was working with the drivers that ATI provides for the Rage 128 card. Rumour has it that Apple's been none too happy with ATI's drivers as well, especially since it has been relying on ATI to help develop Mac drivers for OpenGL. There was no sign of ATI at the Expo, which wasn't a good omen. Apple needs to support the OpenGL 3D standard in order to encourage games companies to produce Mac versions of the games, so it's vital that ATI sorts the problems out.

*My vote for best software release at this year's Expo goes to Unreal Tournament*

## AIRPORT TAKES OFF

**O**ne of the surprises of the Expo was Steve Jobs' demo of the new Airport wireless networking system. The most amazing thing about Airport is that Apple actually managed to keep it secret for the entire 18 months that it was working on the project. That aside, Airport is a real step forward.

Airport is based on an existing wireless technology known as IEEE 802.11. However, Apple has made a few improvements. The main difference is that it provides data-transfer rates of up to 11Mbit/sec, which is much faster than the original 802.11 standard. That puts it in the same league as many Ethernet networks. The base station includes a

conventional modem as well as an Ethernet interface, so people who want to use Airport as an extension of an existing network can do so without any loss in performance.

European telecoms regulations mean that Airport will be unavailable in a few countries, such as Belgium. The company hopes to have Airport available here in the UK shortly after the European launch of the iBook in September.



▲ **THE AIRPORT BASE STATION INCLUDES BOTH AN ETHERNET INTERFACE AND A MODEM**

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# Identity crisis

Bob Walder looks at how **digital signatures and certificates** provide authenticity and non-repudiation.

Last month we looked at the basics of encryption, covering the concepts of secret and public key cryptography. This month we move on to cover digital signatures and certificates, as a prelude to next month's piece on implementing email security.

### ■ Digital signatures

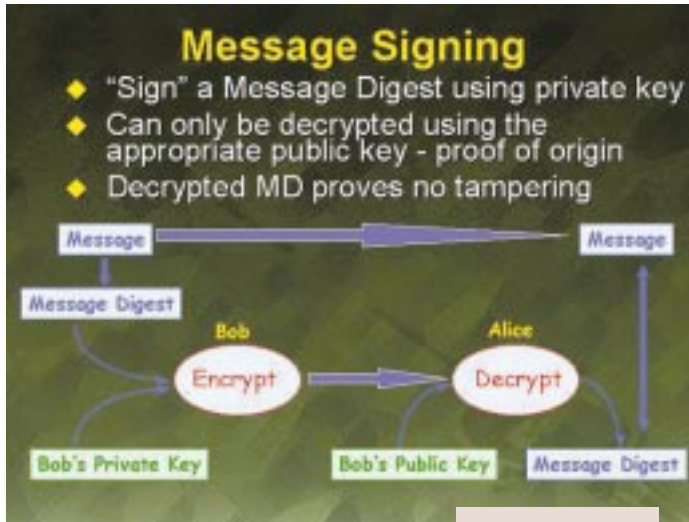
Once we have our data encrypted, to prevent snoopers discovering its content, we still have to prove who we are to the other party involved in the communication. In a real-life scenario, the most important piece of evidence available to one party is the other party's written signature.

We therefore require an electronic equivalent – a 'digital signature'. This useful device not only provides positive proof of ID, but also offers complete non-repudiation (that is, we can prove who signed it and that the contents have not been tampered with in transit).

As with encryption, there are a number of common algorithms available for

digital signatures – RSA (Rivest-Shamir-Adleman) being the most popular. Suppose Alice wishes to send a signed message to Bob. She uses a 'hash

**Remember that signing only guarantees integrity and authenticity not privacy**



function' to create a uniquely concise version of the original text – known as a 'message digest' – which serves as a much smaller 'digital fingerprint' of the message. Once again, there are a number of algorithms available – MD-5 (Message Digest algorithm) and SHA-1 (Secure

Hash Algorithm) being the most common. Overall, SHA-1 is

probably the preferred method. It is unfeasible that different documents will have the same message digest, and even small changes in a document will cause significant changes in the digest.

Next, Alice encrypts the message digest with her RSA private key (or a secret key, if preferred) and this becomes the digital signature, which she sends to

Bob along with the message itself (which may or may not be encrypted).

Bob, upon receiving the message and signature, decrypts the signature with Alice's public key to recover the message digest. He

then hashes the message with the same hash

function Alice used and compares the result to the message digest decrypted from the signature. If they are exactly equal, the signature has been successfully verified and he can be confident that the message did indeed come from Alice. If, however, they are not equal, then the message either originated elsewhere or was altered after it was signed, and he rejects the message.

Note that, for authentication, the roles of the public and private keys are converse to their roles in encryption, where the public key is used to encrypt and the private key to decrypt.

Also remember that signing only guarantees integrity and authenticity, it does not guarantee privacy – encryption of the actual message content must be performed separately if that is required.

**Digital signatures provide** the highest levels of data integrity, since any tampering after signing invalidates the signature. They also provide irrefutable proof of origin that is impossible to forge, since they are based on the sender's private signing key and authenticated by the public verifying key.

Note too that in most Public Key Infrastructures (PKI) today, two key pairs are generated for each user – one pair for

▲ **DIGITAL SIGNATURES OFFER THE HIGHEST LEVELS OF SECURITY**

◀ **DIGITAL CERTIFICATE CONTAINS THE PUBLIC KEY**



encryption/decryption and the other for signing/verification.

■ **Digital certificates**

A digital certificate is a small block of data which contains the public key, together with a confirmation of authenticity from a third party – in the form of that party's digital signature. The third party is the 'Certification Authority' (CA), and it is vitally important that the CA is trusted so that the certificate can be considered genuine.

Probably the best known CA at the moment is VeriSign, although other systems are being introduced, such as IBM's World Registry and GTE's CyberTrust. Even the Royal Mail has established a PKI, using Nortel's Entrust technology.

As things progress, it should be possible (and desirable) to have a hierarchy of CAs, going from banks or other reputable organisations at the bottom, all the way up to government bodies and even the United Nations.

This means that if you don't trust the first CA you can check the certificate on its digital signature with the next CA up the tree, and so on up the hierarchy until (if you are really paranoid) you reach the 'root' CA.

**To communicate securely**, Bob and Alice will first separately establish certificates with a trusted CA by providing concrete proof of identity (perhaps even being required to appear in person). Sometimes the signing and encryption key pairs are generated at registration, and sometimes they are generated separately and transported using a secure token such as a smart card. After registration, Bob and Alice's public keys are bound to their respective digital certificates, which are then signed by the issuing authority.

Once the certificates are created, they are published in a directory. This allows



anyone to look up Bob or Alice and obtain their authenticated public keys for secure communication. Another option is that the sender always includes their digital certificate with any secure communications – this is frequently the most convenient way of working.

Bob encrypts and signs his message and sends it to Alice along with his digital certificate. Alice's mail application will check the signing authority on the certificate to ensure that it is trusted and will check the expiry date to ensure the certificate is still valid, following which it will go through the procedure for verifying the signature that we detailed earlier.

Certificates based on the X.509 standard (the most commonly used type)

incorporate an expiry date to ensure that certificates and their associated key pairs are renewed automatically after a given period. This should happen for security purposes, although for some organisations it is simply a means to generate a revenue stream as users are forced to buy new certificates each year.

■ **CRL checking**

One thing that is also supposed to happen, but for which there is very little support in off-the-shelf applications today, is Certificate Revocation List (CRL) checking. The CRL is maintained by the CA. Occasionally, it is necessary to revoke a certificate in advance of its expiry date, perhaps when an employee

leaves a company or if it is suspected that the private keys have been compromised. This is done by placing the certificate's serial number on the CRL where it can be checked by applications that support this function (limited to the Netscape browser at present, although manual checking is also possible).

**If Alice wishes to**

**purchase** a PC from Acme Computers over the Internet, she digitally

signs the order and provides a copy of the certificate. Acme Computers checks the certificate with the CA to ensure that it has a genuine copy of Alice's public key – it will also check to see that the certificate has not expired or been revoked (the equivalent of a credit card company freezing your card).

Once two parties have exchanged digital certificates (or acquired them from a directory) they can then begin communicating, safe in the knowledge that they have genuine copies of each other's public keys and can thus effectively encrypt and digitally sign all future transmissions between them. This ultimately provides for complete 'non-repudiation', whereby digitally-signed messages can be proved authentic to a third party (such as a judge), allowing transactions to be legally binding.

**The ability to 'extend'** a certificate is also inherent within the X.509 standard, providing the means to hold additional personal information – such as a credit limit – within the certificate itself.

In the future, as we move towards an increasingly cashless society, public key certificate details could be stored securely in devices such as smart cards, providing a truly portable and secure (providing you keep your smart card safe) means of performing electronic transactions.

**PCW CONTACTS**

Bob Walder is a journalist and networking consultant based in Bedfordshire. He can be contacted via email at the usual address: [networks@pcw.vnu.co.uk](mailto:networks@pcw.vnu.co.uk)

# leisure lines

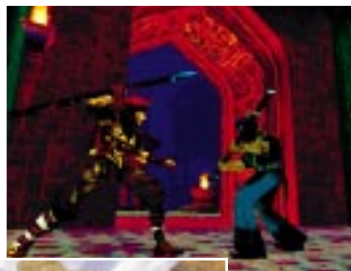
## Empires state building

**W**e've just finished playing the beta version of **Age of Empires II**, and it is looking pretty good. Microsoft's follow-up has several improvements over the original. The units have been made smarter and your tactical choices have been increased. There are also alternatives to fighting, such as trading and diplomacy. More civilisations have been added, together with improved controls. Take a look at [www.microsoft.com/games](http://www.microsoft.com/games).

Take 2 is poised to release **Grand Theft Auto 2** in the coming months. The sequel to one of the most popular games ever will maintain the top-down view and reckless destruction of the original. Developer DMA is very proud of the improved Artificial Intelligence that allows the police and gangs to be operated as an entire unit rather than individuals as in the original. With the promise of 75 missions, GTA2 is looking like a winner. See [www.gta2.com](http://www.gta2.com).

Indy is, as the adverts will no doubt proclaim, well and truly back, in the latest game from Lucasarts. **Indiana Jones and the Infernal Machine** will be a full 3D affair, in which Indy has to

stop evil communists from capturing an inter-dimensional gate that could be used as a terrible weapon. See [www.lucasarts.com](http://www.lucasarts.com) for more action-packed information.



◀ **PRINCE OF PERSIA 3D** UPDATES A CLASSIC  
▼ [LEFT] **INDY IS WELL AND TRULY BACK**  
▼ **YOU'RE THE LAST, BEST HOPE FOR PEACE IN BABYLON 5**



**Prince of Persia 3D** is finally nearing completion. Continuing the franchise begun in the 1980s, this version looks and feels similar to Tomb Raider. Preview screenshots show that the scenes have been beautifully drawn, with the environment giving away clues – blood on the floor may signify enemies nearby, for example. Visit [www.pop3d.com](http://www.pop3d.com).



Further ahead is **Babylon 5: Into the Fire**, due for release in early 2000. This space simulator will feature the ships, actors and setting of the TV series, with most of the action taking place in a one-man Star Fury. One rumoured feature is the ability to flip your ship 180 degrees while still travelling the same direction, adding a new tactical element to a genre often seen as a flight sim in space. See [www.sierrastudios.com](http://www.sierrastudios.com).

## Enter the dragon

**I**f you're like us and Diablo is one of your favourite games of all time, then the imminent release of Delphine's **Darkstone** will be some-

thing to look forward to. It isn't a straight copy of Blizzard's masterpiece though, feeling more like an evolution than a rip off. The main difference is that the game is entirely 3D, allowing the user to control the camera angle.

The goal of the game is for you to defeat Draak, an evil monk who can turn into a dragon, by building a Time Orb. The Orb can only be created by collecting seven crystals from around the Darkstone universe. Thirty-two levels are thrown at you to complete, with the location of the Crystals randomly chosen from 22 possibilities each time the game starts. You can choose to be a male or female thief, wizard, priest or fighter. Early reports suggest that the game is

fairly easy for hard core Diablo players until the final few levels, but less experienced players should find it more of a challenge.

You also have the option to control two characters at once, with multi-player support promised as well. Keep a look out for a full review in PCW. [www.delphinesoft.com](http://www.delphinesoft.com)



# Mad dogs and Englishmen...

... go out in the Tiberian Sun. The heat is on in the third installment of Command and Conquer.

It feels like an eternity since Command and Conquer turned the realtime strategy game into a force to be reckoned with. Prior to C&C, strategy games were about as cool as open-toed sandals. Now, however, they represent one of the most popular PC game genres. This is the third installment in the Command and Conquer series, with the second episode, Red Alert, proving to be one of the biggest selling PC games ever.

Once again you've been thrown into the thick of battle between the Global Defence Initiative and the Brotherhood of NOD. Who the good guys and the bad guys are depends entirely on your point of view and which side you happen to be fighting for. The action is split across two CDs, with each CD playing the game from opposing sides. Not only does this approach allow you to choose which side to fight for, it also doubles the longevity of the game.

Unless you've been stranded on a desert island for the last few years you'll know how a realtime strategy game works. You take command of an array of different units that you have to deploy and utilise in an attempt to achieve set objectives. Getting to know each unit's strengths and weaknesses is the key to a successful campaign, and after some trial and error you'll know what the best tool for a particular job is.

Don't expect any revolutionary features in Tiberian Sun as the advances are far more subtle, and, in most cases,



▲ BATTLES CAN BE FOUGHT AT NIGHT AS WELL AS IN THE TIBERIAN SUN  
▶ PRE-RENDERED CUT SCENES ARE A JOY TO BEHOLD

are features we've already seen in other games of this genre. One of the best new aspects is the ability to set way points. You can set a way point anywhere on the map and command your units to assemble there. However, you can also string way points together, forming a circle. This allows you to form a perimeter around your base for your troops to patrol.

As well as the usual soldiers and engineers, you also have medics at your disposal. These little guys can heal your troops as they get injured, so be sure to keep them safe. Unfortunately, this is where a major flaw in the computer's

artificial intelligence rears its head. While playing one mission, my entire force was wiped out – with the exception of one soldier and a medic. However, these

two men then managed to wipe out almost all of the enemy structures, units and troops. Basically, I sent the soldier in to attack each enemy target and used the medic to constantly heal him during each battle. Now, any human player

would have killed the medic, then wiped out the soldier, but the computer only attacked the soldier, allowing the medic to keep him alive. That gripe aside, the AI is pretty good, and your troops will generally take the best route to a location, rather than going around the houses.

The story line is as rich as ever, but Westwood has invested in some A-Grade actors for the cut scenes. Commanding the GDI forces is none other than James Earl Jones, while Michael Bien takes control of the

action on the ground. The quality of the full-motion video cut scenes isn't stunning, but the pre-rendered sequences are a joy to behold.

Of course, if you don't want to make your way through the story line, you can play skirmish matches against a number of computer opponents, or take up arms against real players. There are a number of multi-player maps provided, but Tiberian Sun also allows you to quickly create random maps. To do this, you manipulate sliders that dictate how much Tiberian, water, cliffs or cities there are. Once you've set these values, the computer will generate a random map around them. This means you'll never run out of maps to play, and that no player will know where everything is.

C&C: Tiberian Sun is a great game and fans of the series will love it. Just don't expect it to be a major advance in realtime strategy gaming.

RIYAD EMERAN



▶ WATCH OUT FOR THOSE LASER CANNONS  
▼ TROOPS CAN PATROL YOUR BASE



## PCW DETAILS



**Price** £34.99

**Contact** Electronic Arts 01753 549 442

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

**System requirements** Windows 95/98/NT, Intel Pentium 166MHz (PII Recommended), 32MB RAM (64MB Recommended), 200MB hard disk space, 4x CD-ROM drive, 2MB graphics card



# Microsoft International Football 2000

If you're after a half-decent footy SIM, then **Microsoft's first sports title** should play ball.



Microsoft's first sports title features the vocal stylings of Ron Atkinson and Jonathan Pearce in tandem for the first time – what more could the most laddish of footy fans want? Well, excellent gameplay and slick graphics would also go down well – fortunately, the Seattle giant delivers in spades on all counts.

Microsoft has certainly put a lot of thought into the game's design. We

particularly liked the simplicity of the controls and responsiveness of the players – it really is a doddle to lace up your boots and paint pretty pictures all over the turf. However, that very turf is part of the problem



with MIF2000. Where are these games held? Microsoft hasn't secured any licensing deals for this release and consequently stadia, teams and players are all essentially anonymous.

## PCW DETAILS



**Price** £34.99

**Contact** Microsoft 0345 002000

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

**System requirements** Pentium 133 processor (Pentium 200 recommended), 32MB RAM, Windows 95/98

As any fan will tell you, a large part of the appeal of 'the beautiful game' lies in its tribalism. Who cares if the actual match is as dull as ditchwater, as long as your lot puts one over on theirs? Strip away club and individual personalities and you're left desperately hoping for a game that can stand on its own two feet.

If you're after a decent footy SIM, this one should suffice, but be prepared to take on the likes of Skonta Skegness at London Stadium.

J MARK LYTLE

# Dungeon Keeper 2

Tired of being a goody? This will **bring out the evil** in you.

Sometimes it's good to take a break from saving the world, releasing the prisoners and generally doing good deeds for everyone. It's at times like these you should tell Dr Jekyll to put his feet up, reach for Dungeon Keeper 2 and usher in Mr Hyde.

This game will bring out the evil streak in anyone. Your task is to run a dungeon that will attract suitably nasty characters to help you in your quest to wipe out all the goodness that exists in the world above. You control the events in the dungeon with the

## PCW DETAILS



**Price** £34.99

**Contact** Electronic Arts 01753 549442

[www.dungeonkeeper2.com](http://www.dungeonkeeper2.com)

**System requirements** Pentium 166 (Pentium II 266 recommended), 32MB of memory (64MB recommended), 2MB DirectX-compatible graphics card (4MB recommended), DirectX-compatible sound card, 285MB hard drive space, Windows 95/98



'hand of evil'. With this hand you can instruct your imps to expand your dungeon, dig for gold or, if you don't think they are working hard enough, give them a good slapping.

For those who like to get more involved, there is an option to cast a spell and enter the body of one of your minions. This gives you a first-person



view of the action, enabling you to wander around your dungeon or lead others into attack.

The game is very easy to get into, with an all-commanding voice guiding you through the initial stages. This allows

you to jump straight in without having to read the manual first.

The multi-player option is something of a disappointment, but if you stick to single-player mode, Dungeon Keeper 2 provides a rare combination of great gameplay and well-executed 3D graphics.

WILL HEAD

# Descent 3

Although it has its downsides, **Descent 3 will provide you with some challenging missions.**

If negotiating tiny access tunnels and sabotaging space stations is your thing, then this latest version of the popular Descent series is for you.

The enemy in this game is a monolithic organisation, the PTMC. Not only has it released a virus that turns harmless robots into deranged killing machines, but it also owes you money.

## PCW DETAILS

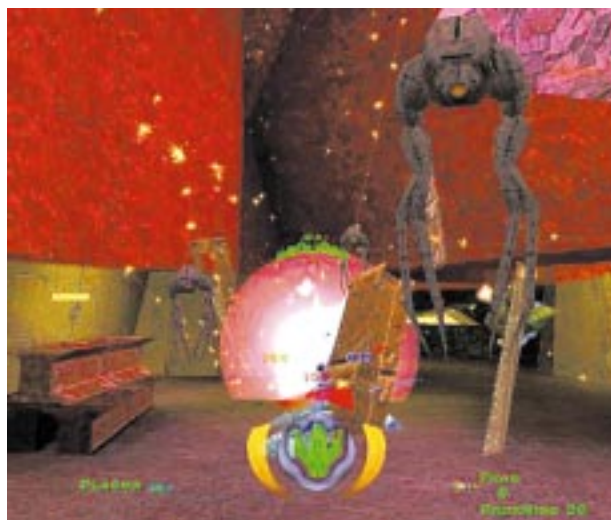
★★★★★

**Price** £34.99

**Contact** Interplay 0171 551 0000

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

**System requirements** Pentium 200 (Pentium 300 recommended), 32MB RAM (64MB recommended), 4MB open GL or DirectX-compatible graphics card, DirectX6-compatible sound card, 210MB hard-disk space, Windows 95/98/NT



To undermine this organisation, you are given a series of missions to complete that generally involve sneaking into a small installation through very narrow tunnels, killing all the insane robots, solving a few puzzles, rescuing a scientist and downloading some vital secret data.

An excellent training mission lets you get to grips with your ship's controls before you enter the game proper. The enemy robots can manoeuvre very

quickly in the 3D environment, making them tricky to destroy. You are helped by your 'guidebot', a tiny robot that focuses the vague mission guidelines by finding the next point you need to reach in the maze of tunnels.

Unfortunately, the fun gameplay is marred by the very low frame-rate that tends to accompany an entrance into a new section of the maze, as all the textures load into the memory. While the graphics jerk around you are often left swearing at the screen, while being shot by a trio of ruthless robots.

However, the cut sequences are great, made all the better by the music that accompanies them. You can also play against others online through PXO, and a level editor is available for download.

JASON JENKINS

# Braveheart

It's deep and complex and may take time to appreciate.

Braveheart started life as a 13th-century war simulation with the working title of Tartan Army, evolving into its current form after a licensing deal. This definitely puts Braveheart a step above other film-to-game conversions and as a result it is extremely rich. The

entire landscape of the UK has been faithfully recreated from Russian satellite data to an accuracy of 50m.

The game itself is very deep and complex, which – on the downside – means that a significant amount of time must be invested before you can actually start playing. If you are willing to put that effort in, though, Braveheart becomes a rewarding experience. Most features have an automatic option



allowing you to concentrate on strategy, action or both, and this gives you a lot of control over gameplay. If you don't feel like getting your hands dirty in a scrap then you can let the game decide the result. If you are not so interested in managing the economy and politics of your clan, then you can hand that aspect over to the computer. As you gain more experience, you can take control back.

The campaign part of the game is in



2D and the graphical splendour only becomes apparent when a battle kicks off. The 3D animation here is superb, but you will need a well-specified PC to view it at a reasonable frame rate.

WILL HEAD

## PCW DETAILS

★★★★★

**Price** £39.99

**Contact** Eidos Interactive  
0181 636 3000

[www.eidosinteractive.com/braveheart/](http://www.eidosinteractive.com/braveheart/)

**System requirements** Pentium 200 (Pentium 233 recommended), 32MB RAM, Glide or Open GL-compatible graphics card, DirectX-compatible sound card, 200MB hard drive space, Windows 95/98

# Ultima Online

This one is **seriously addictive** and a voyage could last years.

Multi-playing capacity is rapidly becoming standard for all new games. Linking to other terminals to play your favourite shoot-'em-up or driving sim is great fun, for the simple reason that you are pitting yourself against another human, rather than a more predictable machine.

Origin pushed the multi-player concept one step further in the first

## PCW DETAILS

★★★★★

**Price** £33.99

**Contact** Electronic Arts 01753 549442

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

**System requirements** Pentium 166 (Pentium II 233MHz recommended), 16MB of memory (32MB recommended), DirectX-compatible graphic and sound cards, 383MB hard-disk space, 28.8Kbit/sec modem, Windows 95/98



Ultima Online game, creating a fantasy world on the Internet that allowed thousands of players to exist simultaneously. This sequel pushes the envelope even further.

The goal of Ultima Online is to survive in a virtual world among thousands of other real players who are trying to do the same. You live in Britannia, a mystical world where you can craft your own sword, tame animals, build a house, run a shop, escort



merchants from city to city, delve deep into perilous dungeons, or just chat with friends. Whatever profession you want to follow or reputation you want to gain is entirely up to you.

The Second Age now hosts a larger playable area, revised 3D landscapes, lost villages, underground caverns to explore, new monsters and non-human races. For novices, a pop-up help function has been added, which gives a short tip for virtually every object.

You are also given unprecedented amounts of freedom to seek your own destiny and compete against real people. Be warned, however. This game is seriously addictive and, once signed up, your virtual voyage could last years.

LUKE PETERS

# International Cricket Captain 2

ICC2 is **detailed without being stifling** and any cricket fanatic will love the wealth of statistics.

Following England's dismal exit from the Cricket World Cup and the test loss to the Kiwis, comes this cricket simulation from Empire Interactive, International Cricket Captain 2. It's a bit late to put things right, but it might heal a few cricket fans' broken hearts.

Unlike other recent releases

– such as Brian Lara Cricket and Cricket World Cup 99, where you actually don the whites and get cracking with the batting and bowling – ICC2 is a management simulation. This involves you achieving the utterly impossible –

working your way up from captain of a county side to captaining England in the World Cup. The task is unenviable. As captain, you are not just expected to have a good innings and rally the



despondent troops. You must also trawl through the reams of statistics, buy new players, train them, act as board of selectors – the list goes on.

Being endorsed by Wisden, publisher of *Cricketing Monthly* and the

*Cricketers' Almanack*, doesn't just lend an air of respectability to the game, it also supplies you with every morsel of info you could ever need.

But the culmination of your hard

work is the match itself, during which you can opt to watch the highlights in almost-realistic 3D and change batting styles, bowlers and the outfield with each over that passes.

ICC2 is detailed without being stifling, and committed cricket fans will love the stats behind the game's façade. With commentary by Jonathan Agnew and some decent graphics, you can't go far wrong. If you succeed, drop a line to the board of selectors at Lords. You might just be needed.

JIM HARYOTT

## PCW DETAILS

★★★★★

**Price** £34.99

**Contact** Empire Interactive  
0181 343 7337

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

**System requirements** Pentium 75 (Pentium 133 recommended), 16MB of RAM, 1MB DirectX-compatible graphics card (4MB recommended), DirectX-compatible sound card, 80MB hard disk space, Windows 95/98

# Backstreet Boys: Moving Puzzle

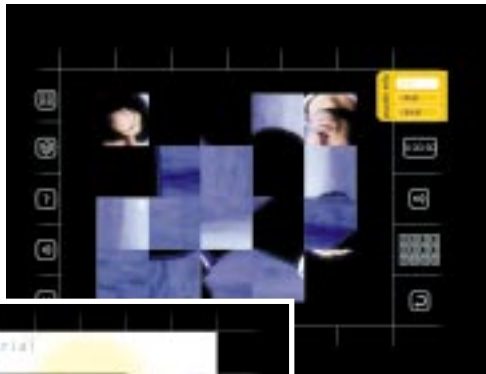
It's called **Moving Puzzle** and it's a bit of a puzzle why anyone should find it a challenge.

If you haven't heard of the **Backstreet Boys** then I congratulate you and seriously advise you not to read this review any further. They are one of the many 'boy bands' popular with teenage girls at present and this CD-ROM is one fans will buy simply due to the branding.

The developer claims that this is a 'must have' item for every fan.

It consists of clips from 12 different videos that the group has made. It also includes musical accompaniments from six of their recent hits, including

*We've Got it Goin' On, Anywhere For You, I'll Never Break Your Heart, Everybody, All I Have To Give* and *I Wanna Be With You*. The video clips have been scrambled and the



aim is to unscramble them, in order to see the darlings singing and dancing in their

original state. There are three stages of difficulty to the puzzles and the user can choose exactly how many pieces they would like their puzzle split into. We're

afraid that's as challenging as it gets. The band is launching *Moving Puzzle* to coincide with their album *Millennium*, and a European tour, but no information about the band or tour was on the CD.

At the end of the day, we feel that *Moving Puzzle* is purely a money-making gimmick and has little or no educational value – or any other kind for that matter. There could have been more variety to the puzzles and it's likely that only die-hard fans will really appreciate it.

ETELKA CLARK

## PCW DETAILS



**Price** £12.99

**Contact** Knowledge Adventure  
0118 920 9100

[www.sierra-online.co.uk](http://www.sierra-online.co.uk)

**System requirements** Windows 3.1x or Windows 95/98, 486/66MHz, 8MB RAM, 42MB hard disk space.

# The Hutchinson History Reference Suite

Reasonably priced and easy to use **History Reference Suite** proves to be a handy tool.

Encompassing no fewer than seven reference packages, the *History Reference Suite* can not only be used by the diligent student, but also teachers and budding historians.

Thanks to the incredibly user-friendly navigation system, based on Microsoft Internet Explorer, historical facts and dates are easy to locate. The main control panel allows you to search for keywords across all seven 'books', which increases the chance of finding what you're looking for.

You'll find even the most obscure historical event gets at least a mention

among the 30,000 facts and figures.

Like most CD-ROM encyclopaedias, the *History Reference Suite* employs not

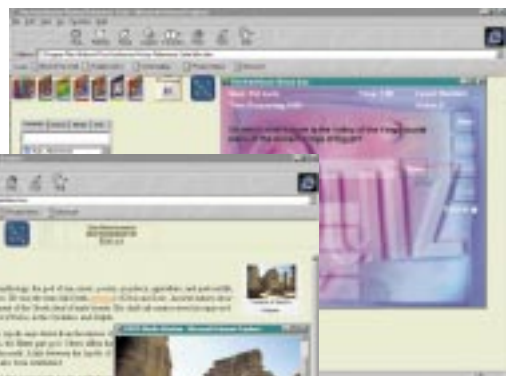
only text, but also a vast array of extras, which makes the learning process that little bit more enjoyable.

Over 500 illustrations and maps are included and

there's a historical quiz if you fancy it.

Perhaps the most useful tool for those in education is the essay feature, which provides excellent web links to past compositions.

Another handy characteristic is the 'trail tab', which follows and records the articles you've looked at, so you can



return to them at any time.

As well as historical events, the suite

provides comprehensive biographies on major historical figures, and within each biography are highlighted hyperlinks to relevant subject areas and famous quotes from that period. The package is well priced and can offer a real insight for anyone interested in past world events.

LUKE PETERS

## PCW DETAILS



**Price** £25.52 (£29.99 inc VAT)

**Contact** Helicon 01865 204204

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

**System requirements** Windows 95/98, 486DX 66MHz or higher processor, 16MB RAM, 20MB free hard disk space, 4x CD-ROM

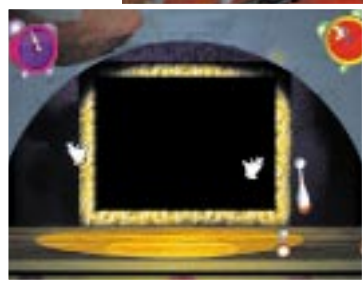
# Masters of the Elements

Education and entertainment may appear **unlikely bedfellows** but this one's a genuine surprise.

A good combination of education and entertainment is so rare to find that Masters of the Elements is a genuine surprise. With a balanced emphasis on both the gaming and educational aspects, this CD-ROM presents a fun and intellectually engaging adventure in a well-presented format.

The fairy-tale surroundings set the scene as you embark on your journey to help the Masters of the Elements re-balance the forces of nature. To accomplish this task you enter five different rooms, where science-based skill

games await your expertise. The game is advertised as suitable for people within the wide age bracket of eight to 102, although a more appropriate age group would be 12 upwards, since the tasks



are not easy. The Room of Electricity, for example, presents a lesson on the conduction of

electricity where the player is expected to set a train and lift in motion by connecting electrical circuits.

Carrying through the theme of elements, the Room of Light offers

players the chance to learn about the reflection of light and linear multiplications of light beams, whereas the Room of Gravity explores gravity with the aid of a seesaw, a crane that lifts heavy balls and a plane powered by an elastic band. Although many of the tasks feature an educational element, the CD-ROM fails to consolidate this by explaining the task you have just accomplished. It therefore misses out on the opportunity to enlighten its players further about the mysteries of science.

CLAIRE MORLEY

## PCW DETAILS



**Price** £19.99

**Contact** Tivola 0181 233 2860

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

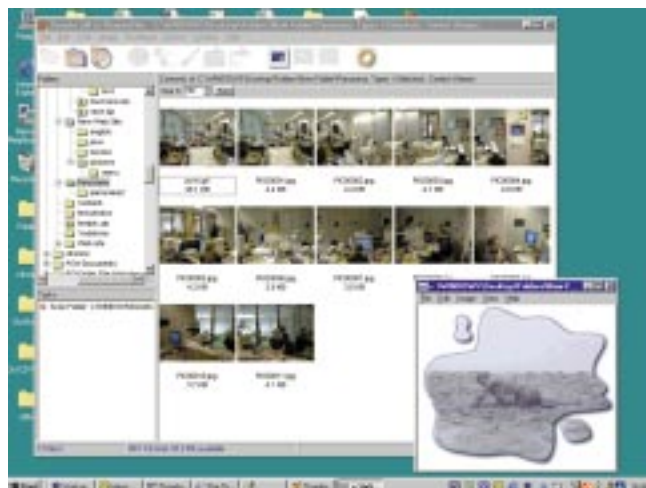
**System requirements** Windows 95/98, 16 MB RAM (8MB free) 2x CD-ROM drive

# Thumbs Plus 4.0

Constantly short-changed by the amount of **images you can hold** on your hard drive? You won't be after installing this...

If you have any more than a handful of images on your hard drive, then keeping them in any sort of manageable order can be a nightmare.

That's where Thumbs Plus comes in handy. Now up to revision 4, this has been a popular shareware utility for many years now, and it's easy to see why. The simple, uncluttered interface presents a tree view of your drives in a left-hand window while the larger window on the right shows thumbnails of the images and fonts in the current directory.



As a directory is selected, Thumbs Plus immediately starts to scan every image it contains, even if they are compressed into a Zip file. Images can be sorted on the basis of orientation, size or even similarity and a single button on the toolbar displays every image in the open

directory as a looping slideshow. Although locations such as the Recycle Bin and Network Neighbourhood appear on the top level of the directory tree view alongside My Computer, Thumbs Plus does not recognise this as the desktop - instead you have to click through to C:\Windows\Desktop (or wherever appropriate on your own PC), which is a shame considering this is a Windows 95-and-upwards application.

If you're planning on building any sort of electronic picture library, or you own a scanner or digital camera, then Thumbs Plus really is a must.

Once installed, you'll never again find yourself trawling through your hard drive wondering what file 034267b.jpg refers to.

NIK RAWLINSON

## PCW DETAILS



**Price** £62.26

(£49.99 + £3 shipping ex VAT)

**Contact** Thompson Partnership 01889 564601

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

**System requirements** Pentium 90, 16MB memory, 20MB hard disk space, 256-colour display, Windows 95/98 or NT4

# Designing with JavaScript: Creating Dynamic Web Pages

Nick Heinle is a JavaScript guru, having contributed to professional sites for CNN, *Star Wars*, Digital and IBM, and he has authored top JavaScript tutorial sites that have proved useful for many up and coming web programmers. Web developer David Siegel, author of the acclaimed *Creating Killer Web Sites* series of books, is quoted on the back of this title saying: 'We use Nick's scripts all the time', so for starters you know it is full of expertise.

The accompanying CD-ROM, for both Macintosh and Windows, contains

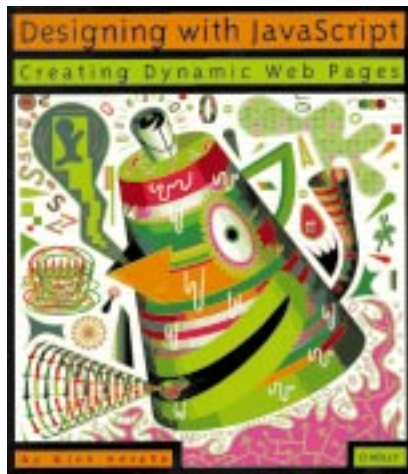
## PCW DETAILS



**DESIGNING WITH  
JAVASCRIPT: CREATING  
DYNAMIC WEB PAGES**

**Author** Nick Heinle  
**Publisher** O'Reilly  
**ISBN** 1565923006  
**Price** £21.95

all the code and demos featured in the book, along with demo software. The problem with JavaScript



is that, while it greatly improves dynamism for web developers who want bells and whistles on their sites, it is based essentially on computer programming languages – even if they are supposed to be easy. Therefore, designers and marketers can find learning JavaScript a daunting prospect.

Heinle breaks down the barrier

between programming and design by looking first at the effects you want to achieve and then simply providing a detailed explanation of how to achieve them. Therefore, you can become a master with the language without having to learn it inside out. You can let Heinle lead you, feeding you nuggets of his creativity and experience.

The book shows you how to implement and use cookies, detect browser types, platforms and plug-ins, create image rollovers and other events and insert variables. Essentially a text-based book, blocks of script are highlighted in green boxes, with numbered references that link to their relevant explanations in the body text.

Throughout the book, Heinle assumes not only a complete lack of knowledge but also a lack of understanding of the processes of JavaScripting, so he's careful to explain in places why things need including.

STEVE MASTERS

# Cutting Edge Web Audio

If there's anything Ron Simpson doesn't know about web audio, then I'm guessing that you could fit it on the back of a matchbox.

Taking a hands-on approach, *Cutting Edge Web Audio* certainly lives up to its title and guides you through the very latest developments in Internet audio technology.

Starting with an overview of the growth of audio over the Internet, Simpson takes an in-depth look at sound editing, converting, encoding, uploading, streaming and budgeting, as well as providing invaluable information on copyright issues. The result is that you will be armed with enough knowledge to suit your needs.

Aimed at anyone who is interested

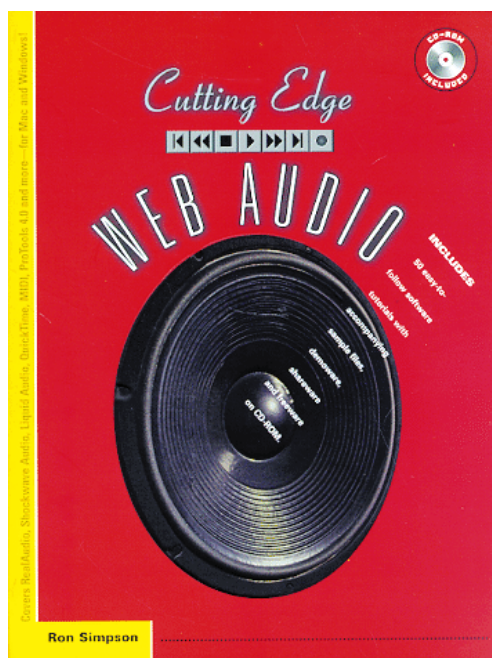
## PCW DETAILS



**CUTTING EDGE  
WEB AUDIO**

**Author** Ron Simpson  
**Publisher** Prentice Hall  
**ISBN** 0130807532  
**Price** £37.49

in utilising sound as a component of their web presentations – be it playing a .WAV file from a



homepage or creating a fully-fledged radio site – Simpson's opening chapters cover all the angles.

Being a relatively new area, the book is targeted primarily at the novice – although there is still plenty of meat

here for the professional who thinks they know everything – and it is all explained in a way that is never patronising, as Simpson keeps things clean and practical.

The book is attractively laid out, taking a tutorial approach to most of the knowledge building.

The author also makes a pretty good stab at covering both Mac and PC platforms, without disrupting the flow of the text.

As with most books of this type, the obligatory free CD turns out to be a real gem. It provides both Mac and PC users with a comprehensive set of the best audio editors, players and converters, as well as a wealth of sound files to play around with and include in presentations.

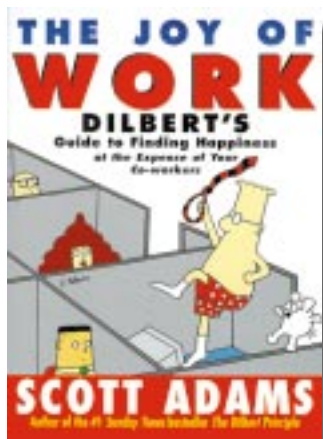
With the constant changes and innovations in current Internet technologies (just look at the 'browser wars'), Simpson will no doubt be kept busy making revisions to what is likely to become the 'web audio bible'.

MATT HONEYBALL

## Dilbert: The Joy of Work

Is it possible to manage your bosses to hide the fact that you're not working? Or so that they don't trouble you with meddlesome things like meetings? Scott Adams, the creator of cubicle inhabitant Dilbert – and once a cubicle inhabitant himself – is not only a source of sarcastic amusement but also an expert in boss management.

This collection of writings and cartoons takes a humorous look at life in the office, by pointing out some everyday



those around you without them realising it.

What backs this up is Scott's inclusion of emails from anonymous fans who have sent him details of their own experiences. One we are tempted to try is this: 'My boss and I were

asked to audit a branch office. She wrote the first draft of the audit, which was pretty scathing. Her boss, the vice-president, sent it back and asked us to edit it for tone. So we took the report printed single-sided, recopied it double-sided, bound it and submitted it. The VP expressed his complete satisfaction with the new, thinner version.'

This is an excellent book that is both funny and educational.

STEVE MASTERS

### PCW DETAILS



#### DILBERT: THE JOY OF WORK

Author *Scott Adams*

Publisher *Boxtree*

ISBN *0752211994*

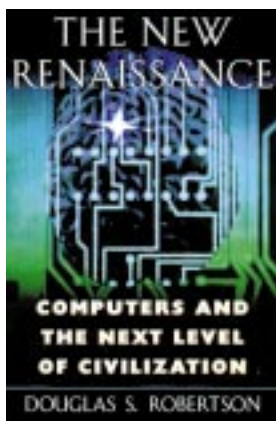
Price *£14.99*

practices that we all know. He also offers some useful insights into how you can actually gain control of

## The New Renaissance

This book reiterates the well-worn theme that the computer revolution is the most important event in the history of mankind. But Douglas Robertson goes further than most, telling us: 'The revolutions sparked by computer theory and technology have brought about changes so vast that they represent nothing less than the dawn of the next level of civilisation.'

Further chapters interpret



In the author's view, the computer makes the necessity for academic examinations obsolete. Instead, he suggests that a student's computer should be used to monitor and assess progress.

He goes further in suggesting that, of the traditional three Rs, 'only reading is going to survive unscathed'.

Writing is less important than the keyboard. In a statement that is calculated to send traditional educationalists incandescent with rage, Robertson argues that 'students should be taught the effective use of calculators, spreadsheets and symbolic algebra software as soon as they learn to read'.

Predicting the future is never easy, and few, Arthur C Clarke being one, have done so successfully. If Robertson is right, then in 20 years' time he will be lauded. If he is wrong no-one will notice.

SEAN HALLAHAN

### PCW DETAILS



#### THE NEW RENAISSANCE: COMPUTERS AND THE NEXT LEVEL OF CIVILISATION

Author *Douglas S Robertson*

Publisher *Oxford University Press*

ISBN *0195121899*

Price *£18.99*

what the revolutionary process will do in practical terms to education, the English language, arithmetic and the arts.

TOP

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books

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Prices include VAT on disks and CD-ROMs. List supplied by The PC Bookshop, 21 Sicilian Avenue, London WC1A 2QH. Telephone: 0171 831 0022 Fax: 0171 831 0443

The mobile networks have been stuck with a paltry 9.6Kbit/sec, but this is about to change.

## Holding on the line

Up to now there's been one big problem with data on the move – anyone using a laptop or a PDA with a mobile phone has been stuck with transmission at 9.6Kbit/sec. This is the outer limit of the GSM specification used by the four UK mobile networks: Orange, One 2 One, Cellnet and Vodafone.

The four networks are now preparing to bid for licences to be allowed to offer services using UMTS, enabling up to 2Mbit/sec transmission. But it's a long way away yet – licences have yet to be allocated and nothing is expected to go live for another three years.

In the meantime, if the mobile operators are to win people over to their vision of a wirefree world, where internet access is available any time, anywhere over almost any device, they must provide something better than a paltry 9.6Kbit/sec. The networks are therefore upping the ante with high-speed circuit switched data (HSCSD) and general packet radio service (GPRS).

**Orange is the only** one going for HSCSD, which will be up and running by the time you read this. It will follow on with GPRS at a later date, in line with the other three providers. HSCSD will mean Orange has a 28.8Kbit/sec service this autumn, stealing a march on the other three operators which will still be stuck with 9.6Kbit/sec until their GPRS systems are ready. HSCSD is fine as a stop-gap but the real quantum leap will come with the implementation of GPRS and the change from switched data to packet data.

In the words of Stuart Newstead, head of commercial development at Cellnet: 'A packet network throws the packets of data at the net and if they can't get through, it throws them again until they do. A circuit switched network throws it once and if it doesn't get through, you have to start all over again.'

**That means, for instance,** that if your train goes into a tunnel in the middle of a surfing session, the connection will just be paused until the line is available again. You won't have to lose the line, redial, and go through it all again. Because GPRS is packet-based, it provides better session management, reliability, error correction, and overall quality of service.

It means a more efficient use of bandwidth

and the possibility of a pricing paradigm, where you pay for the amount of data transmitted rather than by duration of session.

A data session using a circuit switched network ties up two or more channels completely for its duration. It's like trying to make a call while someone else in the house is using the phone. With packet switching, you'd be able to make another call simultaneously by using their pauses.

**Newstead says:** 'With a circuit-switched network, you have a dedicated channel all the time you're online, so even if you're sitting thinking, you're paying for that silence. Under GPRS, you're only using resources when you're sending data, even in split seconds. You can log on in the morning on a laptop and radio card, and stay connected all day, but you're not paying for the pauses.'

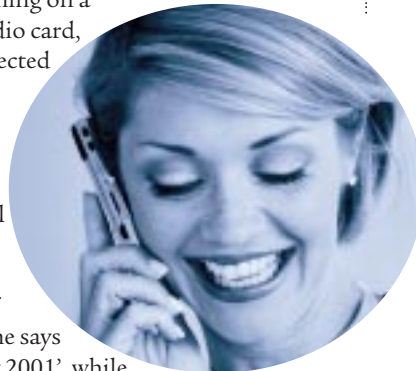
Cellnet will have GPRS online by the second half of 2000. Vodafone says it will be 'early 2001', while One 2 One expects to have it running by September 2000. Orange says 'late 2000'.

**In the meantime,** Orange will keep the customers entertained with a whole bunch of HSCSD-based acrobatics, including launching itself as an ISP (Cellnet's already done this too) and laying on a spread of wireless application protocol (WAP) services.

WAP is a sort of text-only internet that you can access from a mobile phone. For instance, you can call up an ITN news page, choose your story, then read it on the screen of your phone.

However, the wirefree world can't take off until the hardware is available, and the floodgates haven't really opened yet. The main device that will drive take-up of Orange's 28.8Kbit/sec is Nokia's HSCSD Radio Card, a card you can slot into your laptop that plays the same role as a mobile phone, data card and cable.

PERDY PATTERSON





Researchers want to synthesise a computer **the size of a grain of sand** using molecular electronics.

## Fantastic ventures

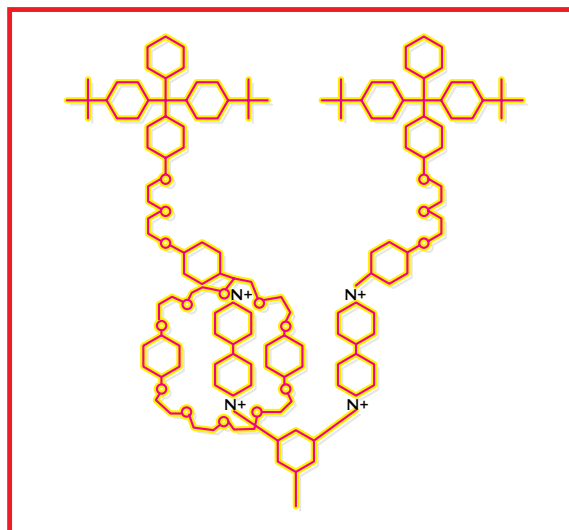
A team of researchers want to build a computer with the combined power of 100 high-end workstations. Not such a surprising ambition, you might think, given the rapidly increasing power of silicon technology – but there’s a twist. Their machine will be the size of a grain of sand.

The scientists, from Hewlett-Packard and the University of California at Los Angeles [neon.chem.ucla.edu/~schung/Hgrp/](http://neon.chem.ucla.edu/~schung/Hgrp/), want to synthesise a computer chemically. The key to their work is a strange substance called rotaxane, a single molecule of which can be made to function as an on-off switch – the basis of all logic operations.

**Rotaxanes are a class** of organic molecule complexes which comprise a molecular ring threaded onto a central linear molecule, like a bead on a wire. The ring can slide freely along the central molecule, and extra ‘blocking molecules’ at each end stop it falling off. The team created a microscopically thin layer of rotaxanes, and sandwiched them between a pair of electrodes. Each electrode is etched with contact points, such that a rotaxane molecule forms a bridge between corresponding contact points on each electrode. Normally, electrons can travel across the rotaxane from one electrode to the other – so the switch is closed. Applying a control voltage, however, breaks the rotaxane’s structure, opening the switch and preventing electrons from crossing.

The team went further, and connected groups of switches together, demonstrating that the molecules could perform the logical operations on which all computing is based. The importance of this research is that for the first time computing elements have been created by chemistry, instead of conventional photolithography. And it’s heady stuff. As Rice University researcher James Tour says: ‘A single molecular computer could conceivably have more transistors than all of the transistors in all of the computers in the world today.’

But because the molecules are synthesised, reactions are rarely 100 per cent successful, so how can the computer possibly work if some of its molecules aren’t well-formed? The team already has the answer to that one. A previous



project created an experimental computer architecture called ‘teramac’, which was built from

hundreds of conventional silicon chips, some of which were known in advance to be faulty [cs.sunysb.edu/~meissner/teramac.html](http://cs.sunysb.edu/~meissner/teramac.html). The lattice of chips could be interconnected in a huge number of ways, using switching and routing mechanisms similar to those in a telephone exchange. Control software, running on chips known to be good, locates buggy chips and ensures they’re avoided. Although riddled with duff chips, the teramac worked well.

**Another problem is how** to reliably connect groups of rotaxane molecules together, because even the thinnest kinds of conventional wires are enormous at molecular scales. One promising possibility is to use ‘nanotubes’ – tubes just a few atoms in circumference, whose walls are made of linked carbon atoms and the technology already exists [pa.msu.edu/cmp/csc/nanotube.html](http://pa.msu.edu/cmp/csc/nanotube.html).

The field of molecular electronics – moletronics – is growing fast, and while researchers are keeping their feet on the ground for now, the ideas are flowing thick and fast.

As HP researcher Phil Kuekes put it: ‘In time computers are going to be so small, you won’t be aware of them.’ Until they crash, perhaps?

TOBY HOWARD

▲ ROTAXANES ARE A CLASS OF ORGANIC MOLECULES THAT COULD REPLACE THE TRANSISTORS ON A MICROCHIP

## PERSONAL COMPUTER WORLD BUYERS CHARTER

### MAIL ORDER PROTECTION SCHEME (MOPS)

When you order goods as a *private* individual reader from a UK supplier's advertisement in *Personal Computer World* and pay by post in advance of delivery to that Mail Order Advertiser, which subsequently ceases to trade and goes into Liquidation or Bankruptcy prior to delivery of such goods, you may, under the 'Buyers Charter', qualify for compensation, providing:

1. You have not received the goods or had your money returned.
2. You have followed the *Personal Computer World* guidelines when placing your order (see over).
3. You have taken all reasonable steps to effect delivery or refund.
4. You have retained irrefutable proof of purchase, for verification purposes:
  - a) A copy of the original advertisement from which the goods were ordered.
  - b) Comprehensive proof of payment.

### GUIDELINES

Claims must be submitted so as to arrive 'NOT EARLIER THAN TWENTY-EIGHT DAYS AND NOT LATER THAN THREE MONTHS' from the official on-sale date of the magazine. Claims must be submitted to the Customer Services Manager IN WRITING, summarising the situation and lodged strictly within the time schedule stated. *Claims received outside this period will not qualify for consideration for compensation under the 'Buyers Charter'.*

Once a supplier who has advertised in this magazine has become subject to either Liquidation or Bankruptcy proceedings and upon completion of all winding-up procedures, *Personal Computer World* guarantees to expeditiously process those *private* individual readers' claims made and submitted, in accordance with those procedures outlined, up to the following limits.

- a) £2,000 in respect of any claim submitted by one Private Individual Reader.
- b) £100,000 in respect of all advertisers so affected in any one year.

These sums define the Publisher's maximum liability under the scheme, and any additional payments above and beyond these thresholds will be entirely at the Publisher's discretion. As soon as legal confirmation that a state of liquidation or bankruptcy exists, the processing of claims will immediately commence. If, however, assets are available and the receiver/liquidator appointed confirms that an eventual payment will be made by way of a dividend, all claims under the 'Buyers Charter' will be subject to re-processing and will take into account any shortfall which may then exist. Payments under the scheme will also take into consideration the obligations and liabilities of other interested parties, such as credit card and/or insurance organisations etc.

### EXCEPTIONS

This guarantee only applies to advance postal payments made by *private individuals in direct response for goods itemised/illustrated in display advertisements*. It does not cover goods ordered from advertising Inserts or Cards, classified advertisements or MicroMart, or Catalogues obtained from, or supplied by, any advertiser regardless. *Similarly, protection does not exist in relation to purchases made as a result of reviews and/or editorial comment.*

The 'Buyers Charter' is designed to safeguard the *PRIVATE individual reader*. It does not provide protection to any companies, societies, organisations, unincorporated bodies or any other commercially orientated outlet of any description. Neither is cover provided for orders placed from, or to, any overseas suppliers or for goods purchased for resale.

### CAVEAT EMPTOR

Readers are reminded that the Mail Order Protection Scheme was solely implemented to provide protection to the private individual when goods are ordered 'Off the Page' and paid for by post. *It was not designed for, nor will it offer any protection, in the event whereby goods are purchased via the Internet.*

### CREDIT CARD PROTECTION

*Always pay by credit card when ordering goods valued in excess of £100, thereby ensuring maximum protection in the event that an advertiser ceases to trade prior to such goods actually being received.*

### DISCLAIMERS

Readers are reminded that the opinions expressed, and the results published in connection with reviews and/or laboratory test reports carried out on computing systems and/or related items, are confined to, and are representative of, only those goods as supplied and *should not be construed as a recommendation to purchase*. Whilst every precaution is taken to ensure that reliability and good business practices prevail, the Publisher cannot be held responsible for the overall trading activities of any supplier referred to, or advertising within, this publication.

## HELPING HAND



Each month Anthony George, our customer services manager, will give advice on what to watch out for when buying computer equipment off-the-page.

A consumer credit agreement becomes a legally-binding contract, once signed by the borrower and the lender's representative. Your rights depend on whether the agreement was entered into face-to-face, by telephone or by post.

In all three cases, when you sign the agreement, you must be given a copy of the document. When the lender signs, the contract becomes legally binding. The lender must inform you, by letter or telephone, that the agreement has started and provide a counter-signed copy of the document within seven days.

If the lender does not comply with the rules, or fails to provide a signed copy with the rules, or a signed copy of the agreement within seven days of its starting, they cannot sue the borrower or repossess the goods without an enforcement order obtained from the court.

#### Face-to-face agreement

If you enter into the agreement face-to-face with the lender you must be given separate written details of the APR, as against the monthly rate of interest quoted by the lender. A lender who fails to provide this information is breaking credit regulations. You must be allowed to read the agreement in full before you sign. You have the right to take the document away to study it before signing. Even when you have signed it, the agreement does not constitute a contract until the lender signs.

#### Telephone agreements

If you request a credit deal by telephone – for example, by ordering goods on interest-free credit – you must be provided with written terms and/or an application form before entering into a contract. You will later be sent a credit agreement document.

#### Postal agreements

If you enter into an agreement by post – for example, by filling in a credit card application form – you must be given written details of the credit terms with the application form. If you return the application and it is accepted, you will be sent a credit agreement document.

Your rights to end an agreement depend on how you entered into it and where you signed it. In the next issue I will discuss your rights to either cancel the agreement immediately, withdraw before it starts, or terminate the agreement.

Anthony George, Customer Relations Department,  
VNU Business Publications, VNU House,  
32-34 Broadwick Street, London W1A 2HG

# order form

Use this form when you order by phone, fax or post.

## SUPPLIER'S DETAILS

COMPANY .....

SALESPERSON'S NAME .....

ADDRESS .....

.....

.....

..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / ..... TIME .....

ORDER REFERENCE NUMBER (IF QUOTED) .....

DESPATCH REFERENCE NUMBER .....

## CUSTOMER DETAILS

NAME .....

COMPANY .....

ADDRESS .....

.....

.....

..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / .....

ORDERED BY:  TELEPHONE  FAX  POST

ADVERT APPEARED IN PCW:  
ISSUE DATE ..... PAGE .....

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
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## METHOD OF PAYMENT

PERSONAL CHEQUE  PURCHASE ORDER  CREDIT CARD

C.O.D  DEBIT CARD  OTHER (SPECIFY) .....

CARD COMPANY .....

ISSUE NUMBER (debit cards only) .....

START DATE ..... / ..... / ..... EXPIRY DATE ..... / ..... / .....

CARD NUMBER ..... / ..... / .....

SUB-TOTAL \_\_\_\_\_

DISCOUNT \_\_\_\_\_

CARRIAGE \_\_\_\_\_

SURCHARGES \_\_\_\_\_

VAT \_\_\_\_\_

TOTAL \_\_\_\_\_

SIGNED .....

DATE ...../...../.....

DAYTIME TELEPHONE NUMBER .....

DELIVERY ADDRESS .....

.....

..... POSTCODE .....

AGREED DELIVERY DATE ..... / ..... / .....

## Purchasing Guidelines

There are several steps you can take to help ensure that the buying process is smooth and trouble-free. We'd like to suggest these main guidelines:

### ● KEEP RECORDS

When you phone a supplier, make a note of the name of the person you speak to, and when. Note down any claims they make for the product in which you are interested, or any specifications they mention. If you are unsure that what they are offering is right for the task, then ask.

### ● GET A FULL SPEC OF THE MACHINE

Before you place an order for a machine, insist on being faxed or emailed a full specification, detailing all components and peripherals. Check what is included: for example,

when buying a printer, are all cables and cartridges bundled in? If you've used a review in a magazine to guide your decision, make sure that what is quoted matches what you have read. Sometimes, machine specifications can change from the model sent for review.

### ● BE CLEAR ABOUT SUPPORT AND WARRANTIES

Make sure that you get a warranty which suits your needs and is fully detailed in the quotation. If you need swift repairs, consider paying extra for an eight-hour repair service. Also make sure you understand the level of service you can expect to receive, including who pays for couriers if your machine has to be returned for repair.

### ● USE CREDIT CARD PROTECTION

When you place your order, use a credit card. The Consumer Credit Act ensures that credit card purchases between £100 and £30,000 are covered. Check the address to which the goods will be sent. Often, if you buy with a credit card you can only receive the goods at the address on the card. If you are buying over the Internet, make sure you are using a secure server, sometimes denoted by the prefix 'https'.

### ● SET DELIVERY DATE AND CHECK WHAT'S DELIVERED

This gives you some comeback if the goods are not delivered on time. When the goods arrive, check the packaging before you sign for them, to guard against damage in transit.

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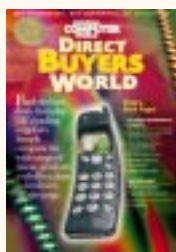
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- 4 The article(s) you have requested will then come through your fax machine.

### IMPORTANT INFORMATION

For the faxback service to work correctly, you must be referring to the current issue of *Personal Computer World* and have your machine set to use tone dialling (you may need to switch your machine from 'pulse' to 'tone').

If you have any problems with the *Personal Computer World* faxback service, please call 0171 412 3795. This helpline is open from 9:00am to 5:30pm Monday to Friday and calls are charged at the standard rate.

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**PCW Faxback number: 09065 600632**

## Inside Relational Databases ▶

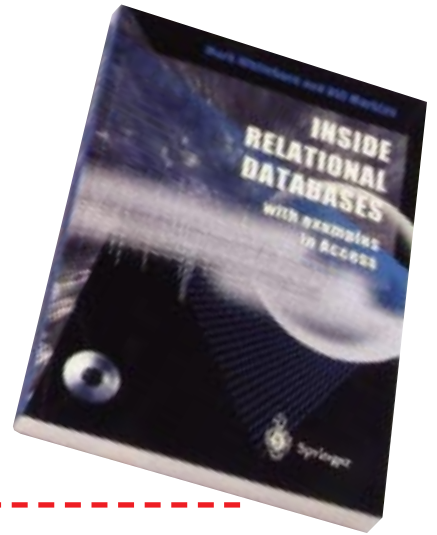
(reviewed in PCW November 97, p329)

- Written by Mark Whitehorn, who writes PCW's *Hands On Databases* column.
- Explains all you need to know to create efficient relational databases.
- Avoids the usual database jargon.
- Includes masses of examples using Microsoft Access.
- Source code for all examples is on the accompanying CD.
- Reader offer price is just £14.50 — a saving of £5 on the RRP of £19.50.

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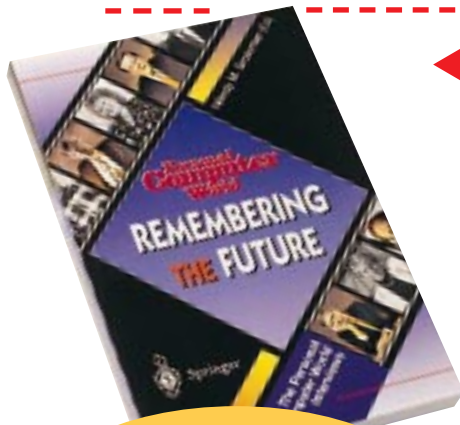
## ◀ Remembering the Future

- Collected interviews from *Personal Computer World*, including Bill Gates, Michael Dell of Dell Computers and Intel's Andy Grove.
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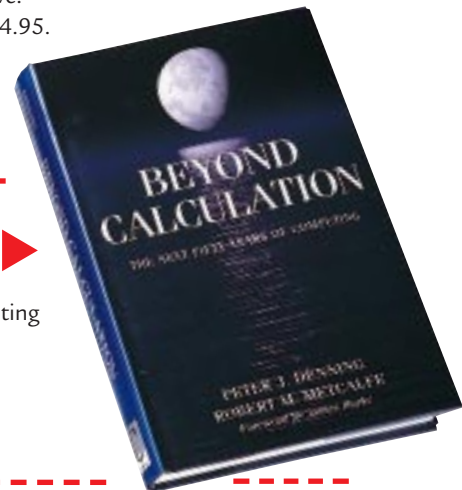
## Beyond Calculation ▶

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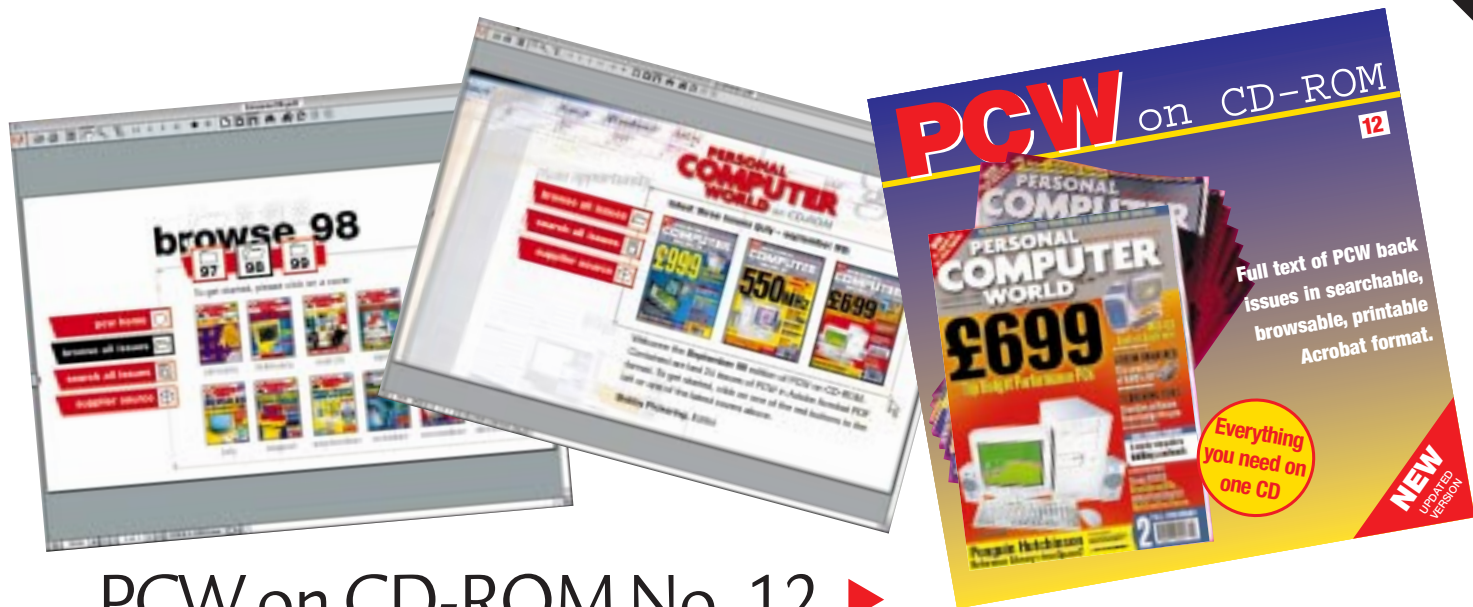
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# crossword/brainteasers

## Quickie

What is the radius of a sphere (in centimetres) which has a volume that is equal to its surface area?

## This month's Prize Puzzle

My wife went shopping the other day and bought three items, each item costing more than £1 but less than £10.

When he saw the till receipt, my six-year-old grandson said that he would check it using his new calculator. But his older sister saw him doing it and realised that he was using the x key instead of the +. To her surprise, he announced that the till receipt was correct, and when she checked it herself, this proved to be the case.

Given that the total number of pence my wife spent ended in 7 (and that the calculator was working properly) what was the price of each individual item?

Answers please, on postcards or backs of sealed envelopes, to: PCW Prize

Puzzle – November 1999, PO Box 99, Harrogate, N. Yorks HG2 0XJ, to arrive not later than 20 November 1999.

We will also accept solutions by email. Send the solution and your name and address only (no explanatory notes or program listings etc) to:

[jj.clessa@btinternet.com](mailto:jj.clessa@btinternet.com)

## Winner of August 1999 Prize Puzzle

A little more difficult than usual. Many of you did the hard bit and got the hidden message, which was:

'Can you tell me the obvious reason why I should have chosen the ninety-ninth cell to start and a cycle length of eight for this particular problem?'

But many failed to get the answer to the question, which is pretty obvious when you realise that the puzzle was set for August 99!

Anyway, we had about 100 entries and the chosen winner was Mr Philip R Holland, Royston, Herts.

Congratulations, Mr Holland, your prize is on its way.

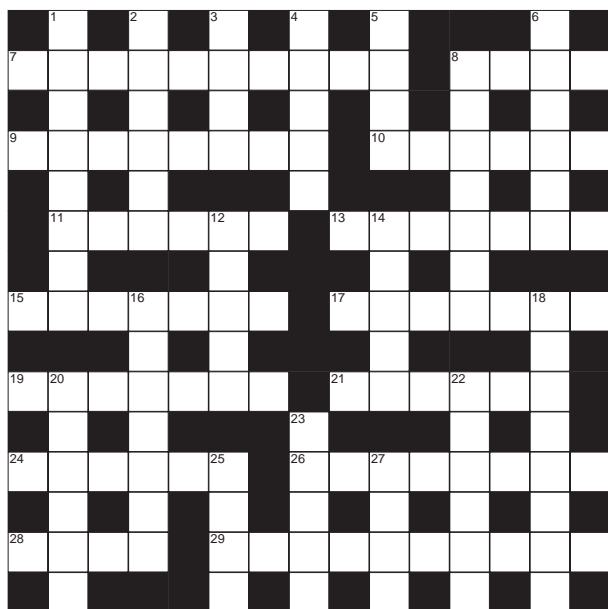
To all the others, keep trying, it could be your turn next.

● If you send an email entry, remember to include an address to where the prize can be sent should you be a winner.

● By the way, have you applied for the latest Clessa Quickie books at the reduced price of £2.25 each? Quite a few of you have already. For further information you can write or email me at the puzzle entry address, or you can visit the new JJ Clessa website at: <http://dSPACE.dial.pipex.com/jj.clessa>. It contains, among other things, answers to earlier quickies, a difficult puzzle (but not the PCW kind, ie the kind that can be solved by whirring computers), hopefully a few readers' comments, a bit of this and that – and, of course, a plug for the latest Clessa Quickie books!

JJ CLESSA

# prize crossword



## ACROSS

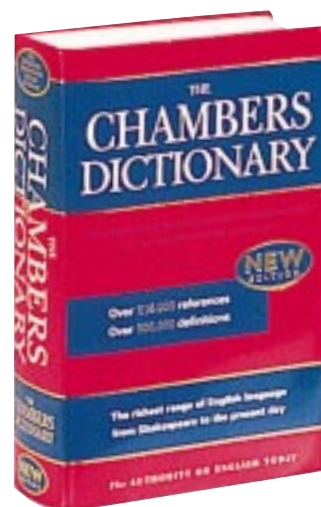
- 7 Allowing for simultaneous sending and receiving (4-6)  
 8 A \_\_\_ wall protects one system from other systems (4)  
 9 Started again (8)  
 10 Defined part of a disk (6)  
 11 Join a file to another (6)  
 13 Fixed amounts of

- storage on a disk (7)  
 15 Work out the code (7)  
 17 A jump from one site to another (3, 4)  
 19 Partial internal stores for data (7)  
 21 Communications protocol and Muppet! (6)  
 24 Software box requiring an answer (6)  
 26 The second T of HTTP (8)

- 28 Microsoft's word processing package (4)  
 29 The largest computers (10)

## DOWN

- 1 Good at maths (8)  
 2 Nearly (6)  
 3 Iron decay (4)  
 4 Woodland clearing (5)  
 5 Choppers (4)  
 6 Slot (6)  
 8 Based on real life (7)  
 12 Frolic (5)  
 14 Atmospheric layer (5)  
 16 Gave away in a draw (7)  
 18 Chatted (8)  
 20 Agreement (6)  
 22 Lose (6)  
 23 Remove clothes (5)  
 25 Sports match (4)  
 27 \_\_\_ Romeo, make of car (4)



Each month, one lucky PCW Crossword entrant wins a copy of the new Chambers Dictionary. The winner of September's puzzle is: Mr Alan Jolley, of Thornton-Cleveleys, Lancs. This time, it could be you. Send your completed crossword to: 'PCW November - Prize Crossword', VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive not later than 31 October 1999.  
 • Please state clearly on your entry if you do not wish to receive promotional material from other companies.

## Solutions to October's crossword

### ACROSS

- 7 Linux 8 Cell 9 Port 11 Sector 12 Explorer 13 Java 15 Bug  
 16 Crash 19 Scanner 20 Default 23 Pixel 25 OCR 26 Gate  
 28 Netscape 30 Serial 32 Wave 33 Slot 34 Table

### DOWN

- 1 Lime 2 Quatrain 3 Revenge 4 Slope 5 Uproar 6 Brie 10 Trebles  
 14 ASCII 17 Split 18 Depress 21 Algerian 22 Somehow 24 Easter  
 27 Lapse 29 Exam 31 Ably

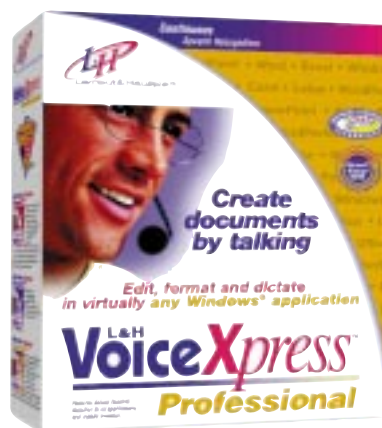
## Win L&H Voice Xpress



It's competition time again and this month we're giving away **10 copies of Voice Xpress Professional**, Lernout & Hauspie's award-winning speech recognition software. Retailing at £119, Voice Xpress Pro will let the lucky winners operate Windows applications on their PC using just voice commands.

Voice Xpress Professional employs L&H's Natural Language Technology (NLT), a suite of sophisticated processes which allow speech-enabled products to intelligently interpret natural speech. NLT significantly improves flexibility and ease of use, by letting users employ conversational speech to navigate in and between applications, and execute formatting and editing functions. L&H Voice Xpress Pro includes NLT support for, among other applications, the Microsoft Office Suite. The package also includes a deluxe headset microphone.

Lernout & Hauspie is a global leader in speech and language solutions for computer systems. The company has made the speech user interface (SUI) its keystone for the simple, convenient interaction between humans and technology, and it is blending the best of human and machine translation technology, tools and services to instantly break down language barriers across the world. You can get more information about Lernout and Hauspie on 0800 973 365, or from the web site at [www.lhs.com](http://www.lhs.com).



So, if you've never been a big fan of typing and you have a Pentium 200 machine or faster with at least 64MB of RAM then this is the prize you've been waiting for.

➔ **To try your luck at winning a copy,** simply answer the following question:

*L&H also sells leading-edge translation software, which enables the translation of text in documents, email and web pages in six languages. What is its name?*

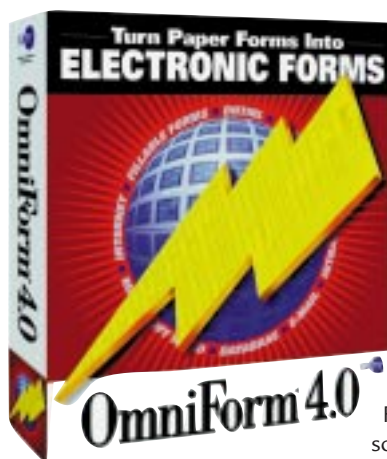
- a) The Lotta Lotta Language Speaker
- b) Power Translator Pro
- c) Speaka de Lingo Mateo

## Win Caere OmniForm 4.0



This month we are giving away **10 copies of OmniForm 4.0**, Caere's upgrade of the award-winning forms application.

Priced at £99 each, this upgrade adds many new features which improve its form conversion, form design, editing and form-filling capabilities. In addition, OmniForm 4.0 provides the ability to save forms to a variety of web-ready formats, including DHTML, HTML and PDF. Designed for Windows 95, 98 and



NT, OmniForm is the only software available that automatically converts any existing form into an editable, electronic structure and then makes that form immediately available for saving to the desktop, the network or the web. These enhancements provide users with the tools they need to create great-looking, intelligent forms for the desktop, the LAN, the Internet and the world wide web.

Features of the software include:

- **Enhanced** logical forms recognition
- **New optical** character recognition
- **New proofreader Wizard**, new auto-fill Wizard, CGI Wizard
- **Better colour handling**, which allows users to more precisely control the colour and pattern formatting of text
- **New toolbars** and new customised toolbars.

For more information on Caere's OmniForm 4.0 and other products visit the website at [www.caere.com](http://www.caere.com).

➔ **To enter this competition,** simply answer the following question:

*How is OmniForm different from any other software?*

### How to enter the competitions

Write your name, address and daytime telephone number on a postcard or the back of a sealed envelope. Mark your card(s) 'PCW/L&H Competition' or 'PCW/Caere Competition' and send to the following address by Friday 29th October 1999:

*Personal Computer World*  
Building 960  
Sittingbourne Research Centre  
Sittingbourne  
Kent ME9 8AG

◆ *Competitions open to residents of the UK only.*

### Rules of entry

These competitions are open to UK readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications, Lernout and Hauspie and Caere. 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.

## A big show issue, **Spock materialises**, we're handed a Psion MC400 and a case of cool *déjà-vu*.

**20 YEARS AGO** November 1979



We previewed the second *Personal Computer World* show, held in a small hotel in West London this month, and among its exhibitors were such towering names from the early days of micro development as Rair, Personal Computers Limited, Research Machines, Tandy and Vero. The show promised the first European chess challenge, with a £1,500 first prize, and a conference that mixed business issues with advice for hobbyists. There were Commodore PETs and Apple user groups preparing to go, but neither of the big names themselves took stand space.

We benchtested the Challenger C3-S1 from Ohio Scientific, which came in two big cases – one housing the computer and the other to enclose the gigantic 32K dual floppy drives. There were three chips on the motherboard – the 6502A, 6800 and Z80 – and a software control program to switch between them, so that all available programs (written in machine code) could be run. We felt the £2,998 machine was fair-to-middling. (By the way, an ad in the same issue for the Research Machines 380Z offered a 56K machine with dual floppy disks at a mere £3,266!)

A feature entitled 'Shakespeare, BASIC and the CIA' investigated the CIA's research into analysing sentence structure in great literary works by Jane Austen and Shakespeare to discover if literary 'fingerprints' could be isolated. The micro was on the track of nailing the global spying fraternity. ■

**15 YEARS AGO** November 1984



Yes, it had to happen. Spock on the cover, and not a sign of emotion. Our excuse being a new high-end home machine called the Enterprise. It came with a built-in word

processor, 64K of RAM, high-resolution graphics, 256 colours, stereo sound and an 80-column display. The keyboard, we observed, looked like 'a cross between a Tonka toy, a panel of the USS Enterprise

and a rubber typing mat'. The compact motherboard boasted a Zilog Z80 running at 4 MHz, and two custom chips – 'Nick' and 'Dave' – which handled video and audio respectively.

You could program your own applications by inserting a BASIC cassette that came with the £249 package. At that price, we concluded, the Enterprise had a fighting chance against the MSX range (starting at £275), the Amstrad (£329, but with a colour monitor), and the BBC B and Sinclair QL (both around £400). We were wrong, however: Enterprise sales never hit Warp speed, mainly through lack of support by software houses.

In an article headed 'Lateral thinking', we tentatively explored the brave new world of natural language processing. First we identified key concepts on which programming logic could be built – in particular, word classifications and grammatical rules. The aim was to teach a computer to recognise the rule that people can own objects, but not vice versa, and given that certain words belong to the two categories 'objects' and 'people', then a computer could theoretically answer both these questions: 'Can John own a Ford Capri?' and 'Can a Ford Capri own John?' Then we got on to the basic principles of programming, including algorithms for storing a word in a computer's vocabulary, searches and tree layouts for visualising word relationships. ■

**10 YEARS AGO** November 1989



It was quite a mobile month for us, although not all good things come in small packages. A mysterious leather-clad motorbiker delivered the spanking new laptop-sized Psion MC400 for us to play with. Former editor, Derek Cohen, predicted that the MC200 and 400, with their proprietary WIMP interface designed by Psion, would still 'grab many people's hearts instantly'. He added: 'As a hardened user of PC-compatibles, I'd still go for the MC400 above the PC-compatible [MC600] model'. Thus, Psion's first attempt to market an alternative mobile operating system

standard, in those pre-EPOC days, was given the official PCW seal of approval.

Meanwhile, that legend of the industry, Guy Kewney, was speaking his mind in the Newsprint section. He'd fallen out with Poqet: a company that had just produced pre-production models of a tiny Psion Series 3 style pocket PC. Kewney went for the jugular, attacking everything from the UK management to the machine itself: 'The keyboard was, frankly, a mess. On a £50 calculator it would have been a drawback. On a £1,300 computer, it was a joke.' ■

**5 YEARS AGO** November 1994



Our Labs were the first to get their hands on a prototype Gateway P5-100P – the first 100MHz Pentium machine we'd ever got our testing gloves on! Our performance

index (then based on an Apricot 486SX 25MHz) showed the Gateway to be a blistering 5.47 times faster than the reference machine. The new machine, we noted, 'looks something like a fridge... with room to keep a few bottles of milk'. This is where we hit *déjà vu* territory with this current issue – our cover star, the supercooled 800MHz Athlon with its LCD temperature display, is much closer to the big white pleasure machine in the kitchen. Although we didn't have a price, we expected it to be around £3,500 when it eventually shipped. For now it was 'the fastest PC money CAN'T buy'!

If you wanted to spend some money, however, we had a mind-bending Group Test of 28 machines based around 66MHz 486 DX2s. Dell, Dan and Panrix were among the winners, but the list of also-rans makes more interesting reading. Do you remember names like Adams, American Pacific, CIC Sigma, ICS, IPC, Mint and Osborne?

In the first of a series of tutorials on ray-tracing graphics, we promised to 'briefly gambol through the subject, using a widely available shareware program'. The program, called PolyRay, allowed us to explore ray-tracing. We showed standard images of 'rendered' objects, such as a teapot floating above a chessboard, before rendering our own. ■

The Internet offers PC users a range of useful not-for-profit information sites and research projects. **PCW continues its coverage dedicated to spreading the news on these good works and whacky ideas.**

## RESOURCES

### Graphics gratis

<http://www.clipart.com/>

This site refers you to hundreds of other sites where you can get free clip art, icons, web graphics and screensavers.

One such website full of free goodies for site designers is

<http://www.co3graphics.com>. Here you get everything from animated gifs and clip art to fully



pre-designed navigation bars, although the horrendous 'background' gifs on offer are probably responsible for producing garish and illegible sites. Choose carefully!

### Action 2000

<http://www.bug2000.co.uk/>

With the Millennium Bug on the horizon, this top-notch site sponsored by the UK Government gives you a lot of free advice on how it might affect you. No matter what your level of technical expertise, it's easy to find information on how to give your PC a clean bill of health. For small businesses and home users, the Software Status Database ([http://business.bug-2000.co.uk/get\\_help/software\\_index-shtml](http://business.bug-2000.co.uk/get_help/software_index-shtml)) is a must.

### Web Hoaxes

<http://ciac.llnl.gov/ciac/CIACHoaxes.html>

How can you be sure that the email you received this morning warning you about a virus or Trojan Horse is the real thing? The recent panic over ExploreZip proved well-founded, but the net is also full of hoax warnings. This site has details of a range of spoofs - like the Good Times virus and the NaughtyRobot email hoax.

### A House without Windows?

<http://zork.net/refund/>

The Microsoft Refund Newsletter site is a cornucopia of riches put together by

## SITE FOCUS

### PC Lube and Tune

<http://pctl.cis.yale.edu/pctl/>

This site announces itself thus: 'PC Lube and Tune is a Service Station and convenience store at Exit 130.132 on the National

Information Highway.' Exit 130.132 refers to the TCP/IP address for the server at Yale University which hosts this site, a project of an enterprising chap called Howard Gilbert who decided in 1994 to provide a series of articles to explain a range of computer technology concepts. These range from 'An Introduction to PC Hardware', through to an explanation of how to partition a drive for dual booting different operating systems. There's information on a selected list of topics (this is not an exhaustive list of all computer technologies), including SNA, OS/2, Windows, distributed applications on the web, Ethernet and Linux. All of them written in no-nonsense, layman's language that is easily digestible.

### Exit 130.132

Fuel	Service
Advice	Education
Honesty	Directions

### PC Lube & Tune

Linux enthusiasts from all over the globe. There's practical advice on how to buy a PC without paying Microsoft a Windows licence fee.

## PROJECTS

### The Cat in the Scanner

<http://www.cat-scan.com/>

CliffyB's excellent tongue-in-cheek site collects together scanned images of cats - pics assembled by netizens around the world by putting their beloved puss on a flatbed scanner and clicking the Acquire Image button. As you'd expect the site has attracted the wrath of outraged animal activists, but also a lot of whole-hearted support from cat lovers as well. Have a look and judge for yourself, and if you've got a moment maybe scan your own pussy and enter it.



### The Power of Images

[http://www.cast.org/strategies/-image\\_barrier.html#Power](http://www.cast.org/strategies/-image_barrier.html#Power)

CAST is an educational, not-for-profit organisation that aims to enable the use of technology to expand opportunities for those with disabilities. However, new technology can not only liberate the disabled, it can also work against them. One of the projects that CAST is promoting aims to help the visually impaired get more out of the web, by helping web designers make

their sites more accessible to those who have poor sight.

### Open Directory Project

<http://www.dmoz.org/about.html>

This site is based on the idea that the best way to assemble a wide ranging 'index of the Internet' is by calling on the (unpaid) services of netizens everywhere. You can apply to be an 'editor' if you have an area of interest and a burgeoning Bookmarks list assembled from hours of web surfing. The 12,508 editors that dmoz has already recruited are expected to ensure that its 670,898 referenced sites are more accurate than others.

### Search the Stars

<http://www.setiathome.ssl-berkeley.edu/>

Yes, the search for extra-terrestrial intelligent life is gathering pace with this project to analyse radio signals from across the Universe. All you need do is download a piece of software

from this US university site and then use the idle processing time, when your PC normally displays a screensaver, to 'analyse' lengthy periods of radio signals to see if any pattern emerges. At the very least, seti@home is becoming the 'coolest' screensaver to use.

**If you've come across any not-for-profit web-based projects and resources that you'd like to share with other readers, let us know by emailing details to: [readerweb@pcw.co.uk](mailto:readerweb@pcw.co.uk)**



# CBS ColecoVision

An arcade-style games console fondly immortalised by *South Park* and saved by Donkey Kong.

In a recent episode of the cartoon *South Park*, Kyle, Stan and Cartman stay with their poor friend Kenny. Much to their dismay, Kenny's dad mentions they couldn't afford Nintendo, but they do have a ColecoVision...

How times change. Only, er, 17 years ago, the ColecoVision was heralded as the world's first 'third-generation' games console, promising 'arcade-quality' games. This was 1982, with the Atari VCS (*PCW*, *Retro*, September), already four years old, but as yet untoppled from its throne. However, Coleco had a cunning plan...

Looking back to the mid-1970s, the surprisingly named COnnecticut LEather COmpany produced the TelStar Arcade home games console. It did reasonable business until upstarts such as Atari came along with removable cartridges and multiple variations, killing the market for simple Pong tennis games. Coleco backed off and prepared for battle.

**With Atari buying** licences for huge arcade hits such as *Space Invaders* and *Asteroids*, Coleco had to take on something equally big to launch its console. It found its killer application in Nintendo's *Donkey Kong*, arguably the world's first platform game. Legend has it the name was derived by the Japanese from a giant gorilla who had kidnapped a girl and was as stubborn as a mule or, erm, a donkey. Unbeknown to *Donkey Kong*, it had kidnapped the girlfriend of none other than the Italian plumber Mario, himself destined to star in one or two minor hits.

Equally unbeknown to Coleco (which had just beaten Atari and Mattel to the home licence of *Donkey Kong* in late 1981), was Universal Studios' impending legal action against Nintendo (and now

also Coleco) over infringement of the King Kong copyright. Coleco allegedly settled out of court for three per cent of all royalties from the game, although Nintendo fought it and won. Coleco apparently also then filed a suit, reclaiming some lost royalties.

It wasn't to matter. Within six months of



release, the ColecoVision console shot to number one, thanks to the bundle of *Donkey Kong* as standard for a fraction under £150. The bulk of its other games were near or perfect conversions of (mostly obscure) arcade games. *Zaxxon* stunned the world with 3D scrolling, while *Smurf* was no different from watching a genuine cartoon!

These were the good times. ColecoVision's industry-leading hardware was based around an 8bit Z-80A processor running at 3.58MHz, backed up by 8KB of RAM. More crucially, the Texas Instruments (TI) TMS9928A graphics processor could drive a TV at an impressively high 256 x 192 pixel resolution and support a massive 32 sprites in 16 colours. Superior sound came from the TI SN76489AN, boasting three channels. Games cartridges came in 8-32KB sizes.

The case was long and sleek and, like Mattel's *IntelliVision*, featured recessed

housing for its two games controllers. And what controllers these were! Each featured not one, but two side-mounted buttons and a 12-key numeric keypad accompanying the somewhat strange stubby joystick. There were optional trackball-roller controllers, too.

**These, however, were peanuts**

compared to the optional Super Action Controller, a pistol-style grip with four coloured trigger buttons and a superb arcade-style stick.

The real key to ColecoVision's success was its unique expandability. Three expansion units eventually arrived: the first litigiously offering compatibility with Atari VCS carts, the second boasting a steering wheel and pedals, and the third in the form of the legendary Adam computer. The Adam expanded RAM to 64KB, came with a keyboard, a pair of 256KB cassette tape drives and a huge daisy wheel printer.

Unfortunately the Adam was pricey and delayed, and by the time it arrived, the great 1984 console depression had sealed Coleco's fate. Not even a *Cabbage Patch Dolls* licence or the promised CED vinyl video record adaptor with a perfect clone of *Don Bluth's Dragon's Lair* could save it. Coleco may have stopped producing its console in 1984, but in the space of two years it had shifted no fewer than six million of them. It lives on in this writer's memory, those of *South Park* and, of course, in emulators on the web.

GORDON LAING

If you want to get hold of a ColecoVision or any other retro console, ring the Retro Computer Exchange on 0171 692 1213.

[www.classicgaming.com/vcoeco/](http://www.classicgaming.com/vcoeco/)



◀ **DONKEY KONG WAS BUNDLED WITH THE COLECOVISION CONSOLE AND HELPED PUSH IT TO NUMBER ONE WITHIN SIX MONTHS OF RELEASE**