reviews

British 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

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.

Contents

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**

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.

You really would be buying tomorrow's technology today

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 breath-taking, 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

★★★★★
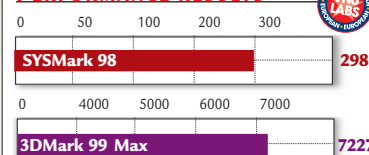
Price £3,499 (£2,977.87 ex VAT)
Contact Carrera 0181 307 2800
www.carrera.co.uk
Good points *The fastest PC on the planet*
Bad points *Very expensive*
Conclusion *Incredible speed at the cutting edge of PC technology. If you can afford it, buy one*

PERFORMANCE RESULTS

	0	50	100	200	300	
SYSMark 98						**298**

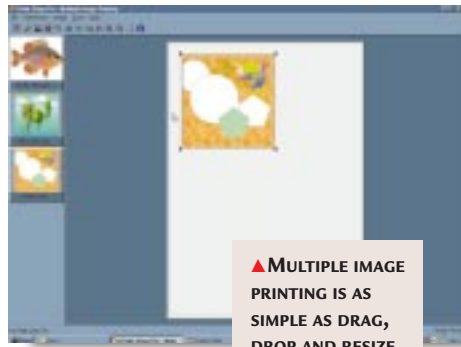|	0	4000	5000	6000	7000	
3DMark 99 Max						**7227**

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.
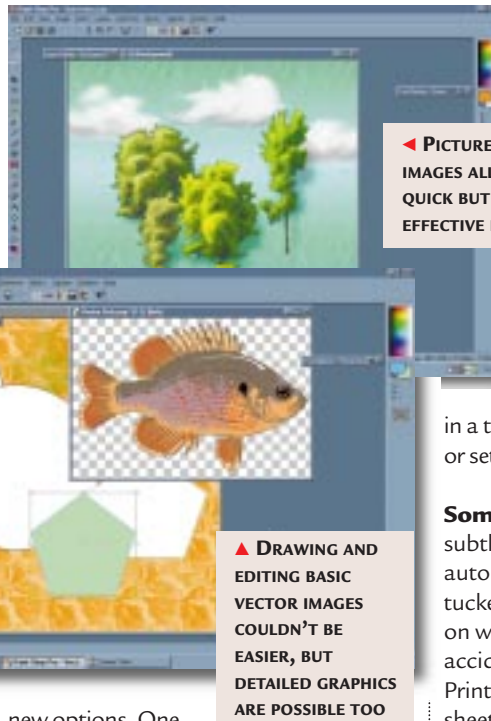
The most important addition is the ability to create vector as well as raster graphics. Vector drawings object-oriented rather than pixel-oriented and can be resized without losing detail or quality, making them ideal for many types of artwork. Three of the tools – Drawing, Preset Shape and Text – can 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.

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

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

▲**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

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

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 Kremlin

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**

Another part of the Study Centre is the Encarta Lesson Collection, with over 30 'teacher-tested' lesson plans.

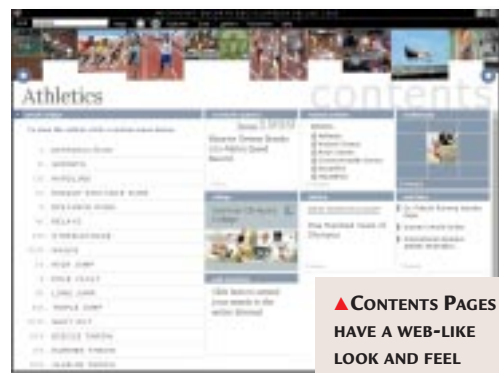As usual, Encarta has more articles – 3,500 more than Encarta 99 – and more videos, animations and photos – 1,500 more photos and illustrations than last year's version. Editorially, the content may well be a little too 'Family Values' for many people's liking – some of the articles from the original 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 gimmickry.

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

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

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

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

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

◄ DETAILED MAPS LET YOU NAVIGATE THE GLOBE

Amari R3K-600 MP2
Workstation

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

Why 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.

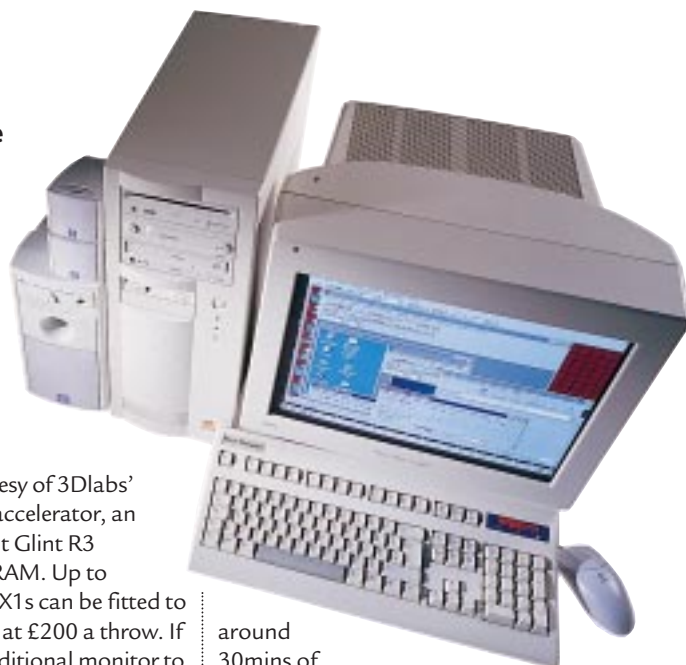**The Asus P2B-D motherboard** has four DIMM slots, two of which are occupied by 256MB of PC-100 RAM. An Intel 600MHz Pentium III sits in one of two processor slots, but until Adobe properly supports SMP in Premiere's software CODECs, a second chip would only be of benefit to those rendering 3D animations.

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
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

	0	50	100	200	300	
SYSMark NT						253

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 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.

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 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 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.
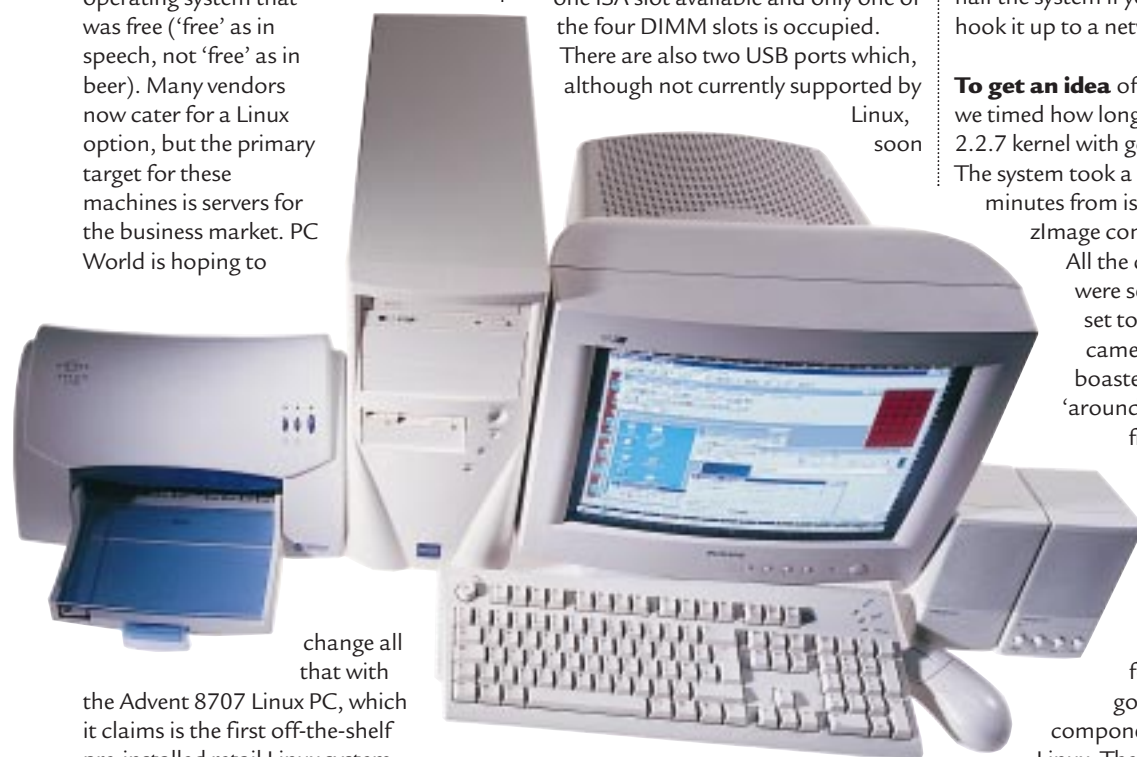
WILL HEAD

PCW DETAILS

★★★★

Price *£938.83 (£799 ex VAT)*
Contact *PC World 0990 464 464*
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

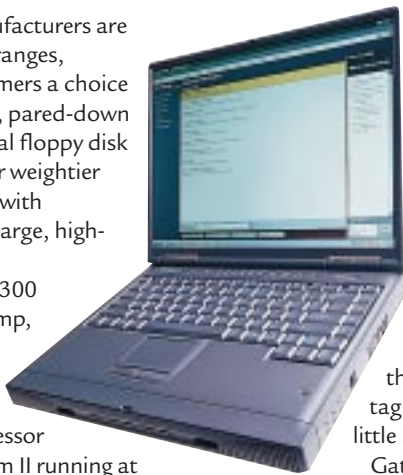| 0	1	2	3	4	
2.2.7 Kernel compilation					4 min 04 sec

Gateway Solo 9300

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

Notebook 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
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.

Sony'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
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.

This 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 for more information*). We set the benchmark to test for one to 10 users.
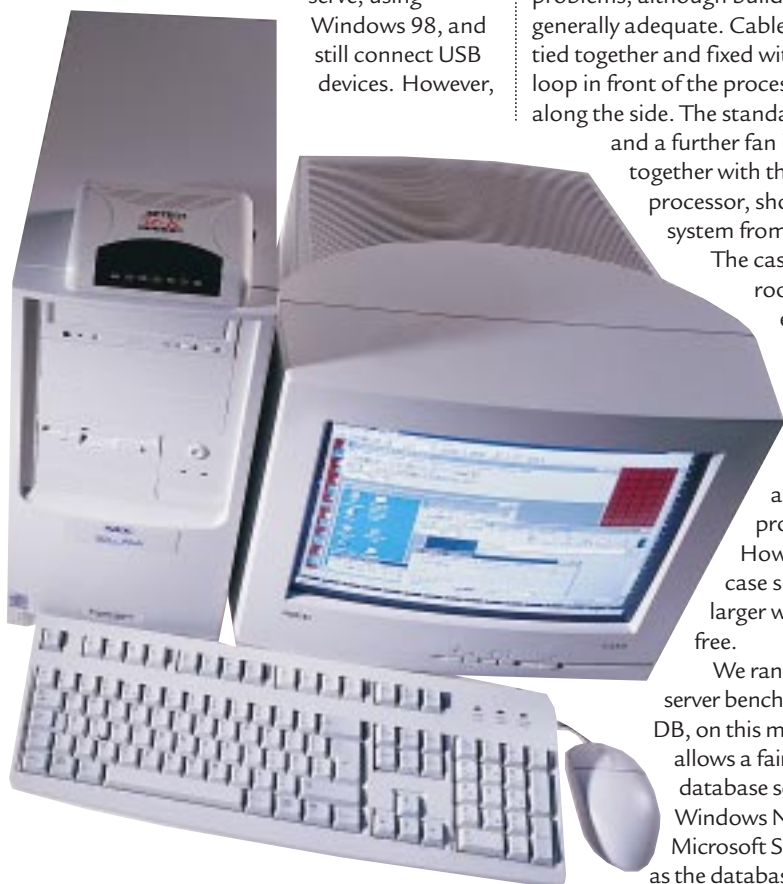
Our results showed that there is no redundancy in this server – the number of average transactions per second levelled off at eight users, meaning when more than this are connected to the server, performance would begin to drop. For basic file and print sharing purposes, however, it would cope, but anything 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
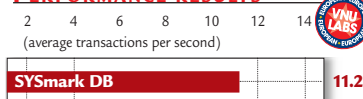**Good points** *Low cost*
Bad points *Inappropriate specification for a machine marketed as a server*
Conclusion *This is really just a standard desktop PC with a SCSI drive, and not one we would recommend for use as a server.*

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.

Delphi 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

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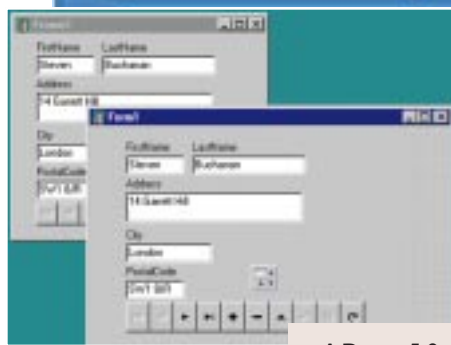

sources, including Access 2000 files.

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

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

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

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

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
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
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
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
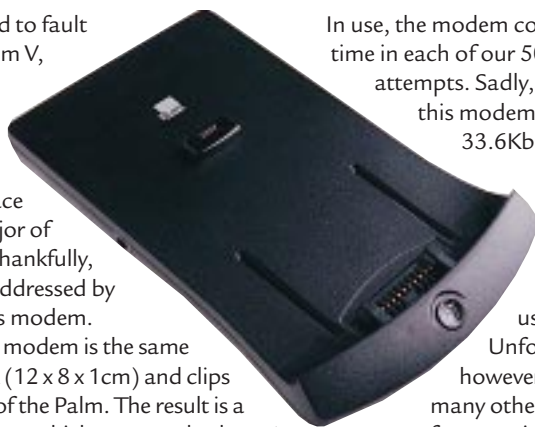
3Com Palm V modem

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 1cm) 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://palmpilot.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
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.
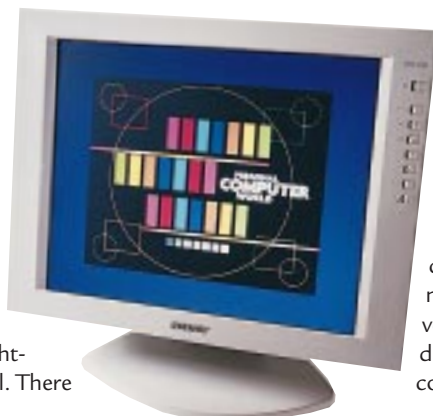
The options in the on-screen display cover most needs, including three colour settings of 9,300K, 6,500K and 5,000K, as well as allowing users to set their own preferences and all phase adjustments for syncing the screen with the graphics card. However, we could find no way of moving the screen vertically 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 *Price £2,461.63 (£2,095 ex VAT)*
Contact *Sony 0990 424424*
www.sony-cp.com
Good points *Screen larger than a 19in CRT*
Bad points *Geometry adjustors 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 321mm 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

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

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

PCW DETAILS

★★★★

Price *£399 (£340 ex VAT)*
Contact *Hewlett-Packard 0990 474747*
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
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
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
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.
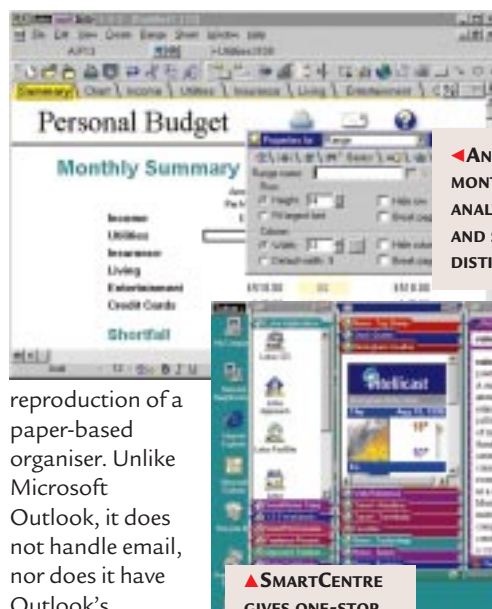
The core components are the WordPro word processor, 1-2-3 spreadsheet, the Freelance Graphics graphics presentation application, and Approach database manager. Supplementary applications include the Organizer PIM, FastSite web publisher and the SmartCentre utility for quick access to all the features 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

▲SMARTCENTRE GIVES ONE-STOP ACCESS BOTH TO APPLICATIONS AND TO INFORMATION FROM THE WEB

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.

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
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.

Simple 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.
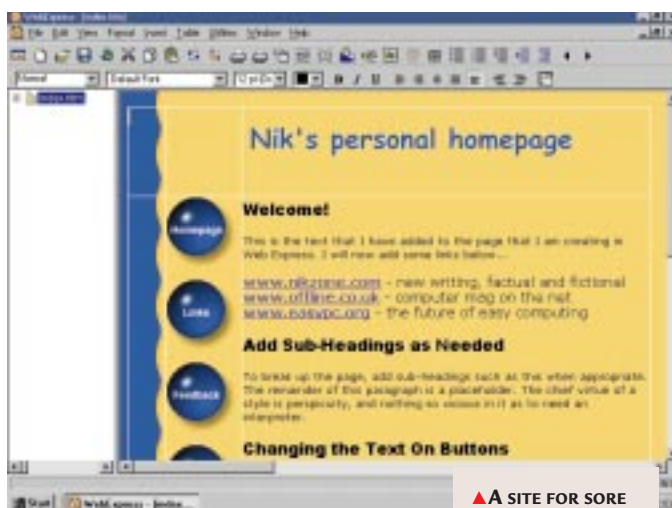
Third, although its excellent handling facilities mean that creating frames is no longer something to be feared, once we inserted a document into a frame we found it rather difficult to change the frame attributes.

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
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.
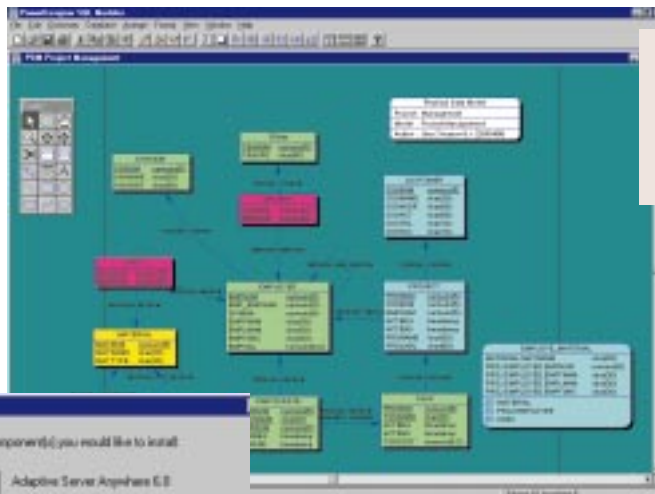
During the early 1990s Sybase was one of the really big names in the database world, but now it trails far behind the likes of IBM, Oracle, and Microsoft. However, one area in which the company still leads is that of mobile computing – that is, the generation and maintenance of databases on handheld 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).

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

◄ **SQL MODELER IS A REMARKABLE 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**

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
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 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

▲ 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 DOMAIN WAS REGISTERED WITH NETWORK SOLUTIONS FOR £25 A YEAR

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-philes 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 Lumpar 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.
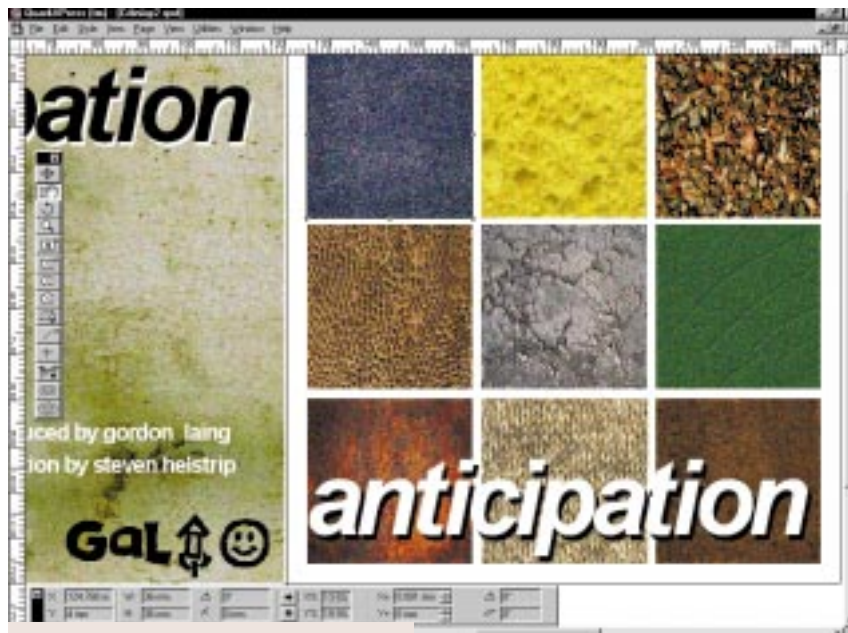
Web publishers will need space on a server permanently connected to the

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

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.