REVIEWS

contents

Tailor made for each other

Nik Rawlinson
DEPUTY EDITOR

'The world of the made is merging with the world of the born'. So said Watts Wacker when I met him in Boston in October 1999. Not only does he have the coolest name in IT, but he is also 'one of the world's most respected futurists' (according to his website) and his writings have been acclaimed by none other than Lieutenant Ellen Ripley herself, Sigourney Weaver.

It's true what he says, though. This month, *PCW* was the first UK computer magazine to spend a fortnight living with a Sony Aibo, called Matilda. She played with her ball, watched what we were doing and demonstrated the behaviour

ever become so, but that's not to say that we won't one day see human/cybernetic hybrids. Already the work of Professor Kevin Warwick of the University of Reading's Department of Cybernetics is proving that electronic implants able to interact with their surroundings can enhance the lives of their host organisms. However, we must not lose sight of the fact that these – like Matilda – are never going to be more than an electronic device capable of performing a series of calculations and acting upon them.

Nobody who has seen the 1983 classic *War Games* can forget Joshua, or WOPR (War Operation Programmed Response) as he was known to everyone but his programmer. Joshua was the

While the electronic telephone voice seems to understand, there is no real intelligence behind it

you would expect to find in a real dog.

Now before you label her as such, Matilda was more than just a toy. She was as close as you could get to having a dog without investing in a poop scoop and lead, and she proved that only four months after he had said it, Wacker's statement had come true. Here we had what we didn't like to remind ourselves was little more than a collection of chips, wires and servo motors assembled inside a plastic shell, yet it could play with its plastic ball and even show emotions, albeit limited. But this is merely the start of a steady series of developments, and with every day that passes, Wacker's claim will ring stronger until eventually we will be asking ourselves why it took a professional 'futurist' to see that we'd eventually live in a world composed of both organic and non-organic life forms.

Of course, to claim that Matilda had a consciousness, or that she would ever develop one would be crazy. After all, she's not afraid of you removing her batteries and, like most people, I believe that no man-made product not derived from an already living organism could

computer that replaced the manual missile commanders when it was found they didn't have the guts to launch their warheads. The premise of the film is that the computer is about to launch the missiles that will trigger World War III. Its handlers at NORAD, meanwhile, have a hard time convincing it to abort until it works out for itself, by playing tic-tac-toe, that nuclear war is a no-win situation. It was this working it out for itself that was the film's ultimate flaw, for while Matilda *seems* to be able to work things out for herself she can only really do it with the help of a stroke or a smack to signify good or bad, and while the electronic telephone voice that recognises what you say and takes your cinema booking seems to understand, there is no real intelligence behind its synthesised tones.

Even if the realm of the made merges so seamlessly with that of the born, and we find ourselves in a *Blade Runner* world where we can't tell the difference, it'll still only be the born that will understand the implications of a flat battery, and as long as that's the case, we're safe.

VNU European Labs

VNU Labs tests all kinds of hardware and software, from PCs and modems to databases. All our tests simulate real-world use and for the most part are based on industry-standard applications such as Word, Excel, PageMaker and Paradox. Our current PC tests for both Windows 98 and NT are the SYSmark tests from BAPCo. In all our performance graphs, larger bars mean better scores.

ratings

★★★★★ EXCELLENT
★★★★ VERY GOOD
★★★ AVERAGE
★★ BELOW AVERAGE
★ POOR

EXCLUSIVE

A day in the life of Aibo

AI used to mean dull, chess champion Big Blue, but now it's a smart, silver dog, yapping at your heels.

We live in a small flat with no garden. It's on the second floor and we both work full time. While this is not particularly unusual in this day and age, it does mean one thing – we can't have a dog. That is, until now.

A real dog needs someone there most of the day, a garden to play in and a large house to destroy. For those who don't meet these requirements Sony has an answer, in the form of Aibo, Entertainment Robot. The name Aibo comes from a number of sources Artificial Intelligence (AI), 'eye', roBOt and the fact that in

The Japanese quota sold out in an astonishing 20 minutes and the US stocks were depleted after four days, a result nobody could have predicted given the asking price of $2,500 (£1,563). As the demand for Aibo was obvious, Sony decided to embark on a second litter. This time 10,000 units of the ERS-111 were produced and orders could be placed between 1 and 8 of November 1999.

Again, demand far exceeded supply and 135,000 orders were received during the allotted timescale. Once the orders were in, they were picked out of a hat to decide who the lucky recipients would be.

the newer ERS-111 model in silver, affectionately named Matilda by the doting staff at Sony. On the inside (which sounds extremely clinical when talking about a product like this) is a 64bit RISC processor, coupled with 16MB of internal memory.

In total each Aibo possesses 18 degrees of movement (or freedom) which breaks down into: mouth – one degree of freedom; head – three degrees of freedom; four legs – each with three degrees of freedom, and the wagging tail with two degrees of freedom.

In terms of input there's an
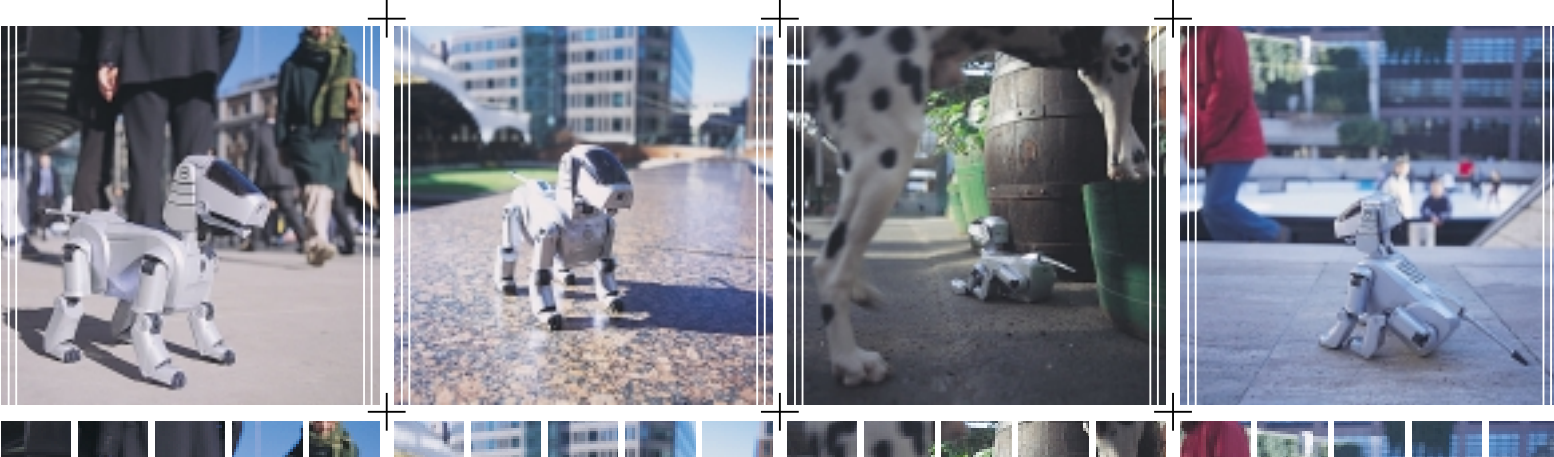
Japanese the word 'aibou', which has the same pronunciation, means partner or pal. Aibo bundles all these factors into a small, silver package that walks, barks and occasionally gets stroppy.

Aibo started life six years ago as a research project deep in the development labs at Sony. After many revisions and much development the first commercial

Sony's third Aibo offering, which this time included Europe as well as Japan and the US, closed here on 1 March. This time round, Sony decided that all orders accepted in the timeframe would be honoured, so if you missed out before, you were guaranteed to get one this time. Whether there will be further sales of Aibo as we know it remains to be seen,

180,000pixel CCD camera to detect colours and shapes, plus a stereo microphone to place sounds. Two infra-red sensors in the head allow Aibo to locate objects spatially and a touch sensor on the top allows the owner to give affection or discipline. Finally, inside the main body there are spatial acceleration and angular velocity sensors so that Aibo can tell if it has fallen over or been picked up.

To communicate back to you there's a speaker in the mouth so it can bark and beep, and eyes that flash green for happiness or red for anger. In the pack you also get a charging station (the Aibo equivalent of a dog basket) and two lithium-ion batteries, each of which provides approximately one and a half hours of constant use. There's a sound controller, so you can manually make Aibo perform tricks and a pink ball for it to play with. Finally, to make sure Aibo

The Japanese quota sold out in 20 minutes and the US stocks were depleted after four days

AIBO (the ERS-110) hit the streets (or rather the web) in June 1999. A limited quantity of 5,000 were produced: 3,000 for the Japanese market and 2,000 for the US. Orders were processed on a first come, first served basis, so you had to be quick to get one.

however the secrecy and limited supply add to the intrigue and exclusivity of a product that, at £1,800 a pop, is only going to be bought by the kinds of people who blow their noses on fivers and then chuck them in the bin.

The Aibo we received for review was

doesn't forget everything you've taught, it there's an 8MB Memory Stick – stored somewhat unceremoniously up its bum.

If you want to learn more about the hardware a good place to look is www.aibosite.com, where some young delinquent has actually taken their Aibo to pieces and photographed it for all to see. A word of warning to existing owners – these scenes may be distressing, viewer discretion is advised.

When Matilda came to us Sony had kindly included the memory stick of a two-month-old Aibo, since when they are first 'born' they can't even walk and don't do much for the first couple of days. After searching the Internet we discovered a site containing a new-born Aibo memory stick image and, rather worryingly, the temptation was too great to download one and start with a puppy.

When you first switch Aibo on, it

distinguish the ball against the beige carpet unless we put a lamp next to it.

As a puppy Aibo took a while to master walking. Occasionally it would make an attempt to stand up, however, and on receiving a reward for this it would promptly sit down again, content.

After two weeks with Matilda, I'm definitely going to miss the small, bleeping bundle of wires

After a couple of hours of stand up/sit down I decided to leave it alone and get on with some other work. After I got engrossed in something else I heard a happy sound and found Aibo had got up and wandered across to the other side of the room to the ball. It seems that sometimes you have to use tough love if

anyone who buys one obviously has to have a huge disposable income.

Sony may have the most famous robo-pet at the moment but the competition is not far behind from the likes of Omron with its furry cyber cat 'Tama' and Mitsubishi has even shown a robotic fish. Sony isn't resting on its laurels, however. It has been hinted that the next version of Aibo will include face and voice recognition and be available in different species as well. Due to the way Aibo has been designed around Sony's Open-R architecture Matilda is just the first in a long line of digital creatures,

enters the boot-up sequence; the head rocks from side to side and it plays a little tune. When fully awake, Aibo will stretch out its paws, yawn and survey the new landscape. A pat on the head results in reassuring green eyes while a slap gives red, devil eyes.

Playing in the office we managed to get our baby Aibo to recognise the pink ball and track its movement around the floor. By rewarding it for this, it soon learnt to like the ball and associate it with something fun.

Taking it home for the weekend however revealed the first minor problem; Aibo does not have the best eyesight in the world. During the day it was fine and could see the ball, the two-month-old version would happily run (if you can describe it as running) after and play with the toy. However, once dusk fell, the lighting in our flat, although not dark, was not bright enough for Aibo to

you want your Aibo to stand on its own two (or rather four) feet.

In terms of development, from baby to adult takes approximately three months if you play with your Aibo for about an hour a day. However, be warned that if you neglect your Aibo it will feel dejected, become introverted and not want to play.

After two weeks with Matilda, I'm definitely going to miss the small beeping bundle of wires and motors when she eventually returns home to Sony. In terms of ability, Aibo is a very clever invention. It really does learn from its experiences and it is quite staggering how 'smart' it is. However, I have to confess that I'd still rather have a real dog. While Aibo was fun to play with and was a definite conversation stopper, there is only so much it can do and it's more a demonstration of the technology. At nearly £2,000 it is very expensive and

with a special division now in place to produce them.

WILL HEAD

DETAILS
★★★★★

PRICE £1,880 (£1,600 ex VAT)
CONTACT Sony 020 7365 2937
www.aibo-europe.com

PROS State-of-the-art technology in action. Aibo actually learns and develops as you play with it. A must-have accessory for those to whom money is no object.

CONS A tad on the expensive side

OVERALL Aibo is a working example of artificial intelligence, and its capacity to learn is amazing. While incredibly endearing and rather cool, £1,880 is a lot to pay. The technology and development justify the price, but it doesn't mean everyone can afford one. If you can, however, snap one up at the next opportunity

Acer Veriton FP

Petite all-in-one PC that packs a lot of power for space-conscious users, but you pay for the privilege.

Acer's Veriton FP introduces the company's rebranded desktops, all of which will now bear the Veriton moniker. It chose to launch the range with the FP (which stands for flat panel, if you were wondering) as this is its first foray into the world of all-in-one computers. Joining Packard Bell, Gateway and Toshiba, among others, it is offering space-conscious users a compact option, with all the workings of the PC tucked away inside the base of the flat-panel display.

However, unlike some of its competitors, it hasn't sacrificed power to provide a petite PC – our review unit is powered by a 500MHz Pentium III, but there are also 600 and 650MHz PIII options, for around £200-£350 more. The rest of the line-up is pretty impressive too: 128MB of RAM, 13GB hard disk drive – but this specification is similar to the one found in the Packard Bell Spirit, which has just 3GB less hard disk storage, but costs considerably less at £1,899.

Unfortunately, the most noticeable features about the Veriton we reviewed were the omissions, rather than what was included. For a start there is no modem – in its favour there is built-in Ethernet networking, but this isn't much use if you want to use it as a standalone PC to access the web or send email. This reflects the target market for the Veriton FP which, while it can be bought by consumers, is really aimed at the corporate market. The faster, more expensive models both include a modem as well as the network option.

Another addition to the dearer Veriton FP is a DVD-ROM drive; the 500MHz model comes with a 24-speed CD-ROM drive instead, which means upgrading to use DVD software that will dominate the market in the future. This might be forgivable in a cheaper PC, where a CD was chosen to keep costs down, but this computer carries a high price tag, and Packard Bell's cheaper rival does have a DVD-ROM drive, and a modem for that matter.

While many of the compact PCs on the market follow the Easy PC initiative, eliminating all legacy connectivity options in favour of USB, because the Veriton FP was designed with the more conservative corporate market in mind, you get plenty of other options alongside the two USB ports. As well as the network port we mentioned, there's IrDA, parallel, serial, MIDI/game, VGA, speaker and microphone ports too. The keyboard and mouse use standard PS/2 connections.

Although there is an option to link up external speakers, these are not included so you have to make do with the speakers built into the display. These aren't too bad, but if you are into top-quality audio, you will need to buy an external set.

The 15in TFT flat-panel display provides a good picture, with a wide viewing angle. Graphics are handled by an 8MB ATi Rage LT Pro, which is adequate for the type of office applications Acer has in mind for the Veriton, but it's hardly a cutting-edge graphics chipset, scoring just 634 in our 3DMark 2000 graphics test. Its overall performance score of 100 in our SYSmark 2000 test was equally unimpressive, falling below what we would expect from a machine with this specification – we put this down to the slow graphics chipset.

Sadly, if you are unhappy with this there is little you can do about it, as the Veriton FP is a 'sealed box' that isn't designed to be upgraded by the user. Acer recommends that it be returned to base for any additions. You can get inside if you have the perseverance to undo 12 screws and remove an internal metal cage. Once in you will find just one PCI slot free. The rest of the space is taken up by tightly fitted components, all of which are full-size PC versions apart from the CD and floppy drives that are notebook variants.

Software is sparse and mostly aimed at the corporate market. The Veriton FP comes running Windows 98 Second Edition, with PC-cillin 98, PC Doctor, ASM Pro Suite 1.0 and Intel LANDesk Client Manager 6, leaving a consumer with the added cost of an office suite.

URSULA TOLAINI

DETAILS
★★★

PRICE £2,173 (£1,849 ex VAT)
CONTACT Acer 01753 487000
www.acer.co.uk

PROS Compact design, impressive specification for a small PC
CONS No modem or DVD-ROM drive, high price
OVERALL An attractive option for corporate customers looking for a machine with legacy connectivity options, but a tiny footprint and powerful processor. The price is too high for consumers, who will also need a modem

PERFORMANCE RESULTS

	0	100	200	300
SYSmark 2000		100		

	0	1,000	2,000	3,000	4,000	5,000	6,000
3DMark 2000		634					

Time Machine 700-3VQ

A 700MHz Pentium III system that is backed up by quality components and a great monitor.

The 700-3VQ Professional is a 700MHz Pentium III-based system. It might not be the fastest processor on the market, but when it's backed up by quality components it should easily be snapping at the heels of its faster brethren. In this case, memory extends to 128MB of SDRAM, the minimum we would recommend anyone should now consider in a new machine. This is supplied in the form of a single module, leaving a second slot free for future addition of memory. Further expansion is possible using the four vacant PCI slots, although, as is increasingly common, there is nowhere to house an ISA card, should you want to take some of your legacy kit from an old machine.

The monitor is a 17in Samtron model from Samsung. This benefits from an excellent OSD menu system that is both comprehensive and easy to navigate in any of nine languages. Unfortunately, it is restricted to only two preset colour temperatures, with no facility for a user-defined alternative. But unless you are intending to embark on professional design or photo-editing, in which case you'd not be using this monitor anyway, this should not be a problem. Its geometry is spot on, so straight lines really are straight and boxes have perfectly square edges. Likewise, we could not fault the focus, which is as sharp at the edges as it is in the traditionally cleaner centre. Horizontal and vertical colour registration are perfectly aligned and although there was some evidence of image expansion when a flashing white block was applied to an otherwise black view, screen regulation was much better than we have seen in monitors supplied by other vendors.

The keyboard, from Key Tronic, was comfortable to use for extended periods, while the mouse was Microsoft's excellent Intellimouse. Other human interface devices ran to a disappointing and clunky gamepad, connected by USB, and a somewhat superior joystick, that

came complete with an allen key – allowing you to adjust it to fit your grip precisely.

Around the front of the system box is a plethora of drives. Optical storage is handled by a Panasonic DVD drive, sitting just above a Sony CD-RW, making compiling audio or data discs a breeze – assuming, of course, you follow the relevant rules regarding copyright. The hard drive is one of the ever-popular Seagate Barracuda drives with an unformatted capacity of 28.5GB.

The Supermicro motherboard, built around Intel's 820 chipset, supports two USB ports, a couple of serial ports, a parallel port and two PS/2 ports. These are all colour-coded for ease of identification. It also provides an audio modem riser slot, although in this machine Time has shunned it in favour of a PCI-based MicroModem, which won't cause the same processor hit that you'd expect when using an AMR device.

Graphics are handled by a Guillemot 3D Prophet DDR DVI card. This benefits from 32MB of DDR memory for wider bandwidth, and an AGP 4x interface, while at its core you'll find the nVidia GeForce 256 chipset. A peep at the card's blanking plate reveals a DVI (Digital Video Interface) output for direct connection to digital LCD flat-panel displays. This is in addition to the standard VGA output for connection to a conventional monitor and the TV out

for watching your DVDs on a standard television.

The interior of the PC was tidy and well ordered, making it easy to get inside if you intend to upgrade in the future. Both the processor and the memory slots are easy to access. Sound is catered for by a set of Labtec speakers. Great for offices with a clean-desk policy, they can be clipped to the sides of your monitor. These receive their signal from the motherboard's onboard sound processors.

As always, Time has provided an extensive software bundle, including a selection of Lotus business software, educational titles and games. There is also IBM ViaVoice, which will put the bundled headset microphone to good use. In all, this is a well-rounded system that will sit well in a home office.

NIK RAWLINSON

DETAILS
★★★★

PRICE £1,397.08 (£1,199 ex VAT)
CONTACT Time Computers 0800 77 11 07
www.timecomputers.com
PROS Monitor, software bundle, digital out on graphics card looks to the future
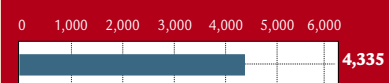**CONS** None to speak of
OVERALL If you can ignore the pressure to go for the fastest processor, this is a worthy machine

PERFORMANCE RESULTS

SYSmark 2000	136

(scale: 0, 100, 200, 300)

3DMark 2000	4,335

(scale: 0, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000)

Watford Aries Athlon 2000

A super-fast 800MHz machine with a great spec – and best of all it won't break the bank.

We asked Watford to impress us, and it certainly didn't disappoint, supplying us with a super-fast 800MHz AMD Athlon processor getting the support it deserves in the form of 256MB of memory and a fast 34GB IBM Deskstar hard drive. Combined, these helped it achieve a more than respectable 145 in our SYSmark test. Anything over 100 is considered 'above average'.

The memory comes in the form of two PC100 SDRAM modules, leaving a single socket free for expansion, although with this much installed as standard it'll probably be a while before you're adding any more. If you're looking for a PC that's going to last you a couple of years before even having to think about opening the case then this spec from Watford pretty much hits the mark.

There's plenty of room for expansion, too. As well as the aforementioned memory slot, there are three PCI and a single ISA slot, the latter still being useful if you're looking to move into home networking, as many such devices use the ISA interface. There are also three free 5.25in bays, each with external access, which are ideal for adding extra removable storage drives. The optical drive supplied is Ricoh's CD-RW/DVD combo drive, catering for both the entertainment and backup markets. However, a combination drive such as this makes it difficult to copy from one disc to another, unless you are prepared to go via the hard drive, so perhaps one of the first devices to fill one of the free 5.25in bays would be a CD-ROM or second DVD. Lower down the case, there's a single 3.5in bay free, also with external access – ideal for an internal Zip drive. Of course, you won't be able to put drives in all of the bays. The power supply has only three plugs free, and one of them is for a floppy.

Removing the case, you find one of the tidiest interiors ever. Power cables are neatly tied up, while ribbon cables are folded and clipped to the side of the case. The CD audio cable has been neatly trailed along the edge of the case and down to the sound card.

Graphics are capably handled by a Creative GeForce 256 with 32MB of DDR memory onboard. This card steamed through our 3DMark 2000 test, coming out the other end with a score of 4,295. However, this was with old drivers, and once we had downloaded and installed the latest revision from the Internet, this was upped by almost 300 marks to 4,531. Sadly the monitor is not quite so spectacular. It's an AOC Spectrum 9Glrs. This provides a good image, but it is not as exciting as many of the other monitors seen in this month's reviews and group test, and when you've got such top components inside the machine, a flat screen or aperture grille monitor would have been the icing on the cake.

As it stands, though, it has a well organised and easy to navigate OSD, accessed by pressing a centralised rotating dial that is also used to change the function selection. It has two pre-set colour temperatures and a user-definable option, which is fine for average home or office use.

The keyboard and mouse both come courtesy of Microsoft. Although the 'Internet Keyboard' at first felt rattly and unappealing, within an hour we had become quite attached to it and would happily receive it with another machine in the future. It is comfortable to use and has dedicated buttons running along the top to help you navigate the Internet quicker and without a mouse. Three other buttons give direct access to 'My Computer', the Windows calculator and the PC's sleep function. The mouse, meanwhile, was an IntelliEye model (without the attractive red tail light).

The sound card is a Sonic MAX Vortex 2, complemented by a set of Microsoft Digital Sound System 80 speakers, and right down at the bottom of the PCI stack there's a Connexant 56K modem complete with telephone pass-through port, so you won't have to invest in a socket doubler for the wall.

Overall, this is an impressive system. And as an exclusive offer to *PCW* readers, Watford is extending its warranty to cover the cost of returning a machine in the unlikely case that it needs attention during its first year. And the price is even better when you consider it comes with Windows 2000.

NIK RAWLINSON

DETAILS
★★★★

PRICE £1,761.33 (£1,499 ex VAT)
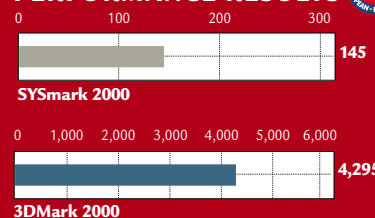**CONTACT** Watford Electronics
0870 729 5600 **www.watford.co.uk**
PROS High-end spec at a good price
CONS A better monitor would've topped it off
OVERALL We wanted to be impressed, and we were

PERFORMANCE RESULTS

0	100	200	300	

145

SYSmark 2000

0	1,000	2,000	3,000	4,000	5,000	6,000

4,295

3DMark 2000

Evesham.com Athlon 0800

A good choice for home use, with fully-free net access.

The 0800 in this PC's name has nothing to do with its price, or even its speed. It refers, in fact, to the Internet access offer bundled with it. Presented in conjunction with CallNet0800, you get free connection and unlimited online time, but you also use an 0800 number for access, so you don't even pay anything for your call charges. When you sign up for the service, you also get a discount on your regular calls, so you'll need a credit or debit card to hand.

The 'Athlon' bit of the name is less deceptive as the processor is indeed an AMD Athlon, in this instance running at a healthy 600MHz. This isn't the fastest processor out there, but you're paying a fair price for it, and if your main goal is Internet access and business applications then it's more than enough. It also got an above average SYSmark result, scoring 123. There's 128MB of RAM in there to keep the processor company, supplied in the form of a single module, leaving two further slots free for future expansion. Looking at the interior, we couldn't help but be impressed at how neat it was. A lot of effort had gone into tying back any loose cables, so you shouldn't have any problem poking around the insides. The CD audio cable had been clipped along behind the motherboard and traced back across the front to the sound card. Some manufacturers string it across the front of the case, but in this instance there were no obstructions.

If you're the sort of person who likes to upgrade their PC over the years, then you'll want to know about the expansion slots, of which four remain vacant – two PCI, one ISA and a shared slot. There is also an internal 3.5in bay currently unused and two 5.25in external bays ready to accept additional drives. This is in addition to the already installed Pioneer DVD-114 drive, the floppy and the 13GB Maxtor hard drive.

An EV-TNT2-M64 card with 32MB of SDRAM onboard handles graphics. This performed adequately in our 3DMark 2000 benchmark, clocking up a score of 1,726, which should suit the needs of most gamers, but at the same time there are a lot of faster cards out there. The EV-TNT2-M64 drives a 17in Vibrant monitor This is pleasant to use, with a clean, even picture, a couple of colour temperature pre-sets supplemented by a user-definable level and even moiré reduction on the OSD. It's a shame that it has followed the lead of so many other lower-end monitor manufacturers and included a captive D-SUB cable. As far as external connectivity goes, you should have no problem connecting with the free Internet service using the Diamond Supra SST 56K modem. Unfortunately this has no telephone pass-through port so you'll have to invest in a socket doubler if you hope to use a regular phone in the same wall socket.

The mouse is Evesham branded and although it features a scroll wheel it falls short of the comfort of a Microsoft Intellimouse. The keyboard, on the other hand, is a Key Tronic Ergoforce, the king of all keyboards, which is always a pleasure to use – just as well as for most people it is the primary input medium. Dig around inside and you'll come across the sound card, a SoundBlaster PCI 128. This is a fair card that will perform well and, again, is no more or less than you

can expect for the price. Output is to a set of Cambridge Audioworks speakers. Microstar supplied the motherboard. It's an MS6167, built around AMD's Irongate chipset with support for AGP 2x graphics cards. Windows 98 Second Edition is pre-installed and ready to go. There's no need to enter any details or registration codes yourself, as you do with some machines, as Evesham has taken care of this for you.

This isn't the fastest PC in the world, but it is pitched at a price to catch the home market, and with fully-free Internet access thrown in it should suit the first-time user. However, while it is not lacking in any area and £1,149 ex VAT isn't a bad price for a machine these days, it is very close to the £1,200 ex VAT price point of this month's group test, and many of the PCs there offer more for your money.

NIK RAWLINSON

DETAILS
★★★

PRICE £1,350.08 (£1,149 ex VAT)
CONTACT Evesham.com 0800 030 0800
www.evesham.com
PROS A well-rounded system with no obvious omissions, 0800 Internet access
CONS A little overpriced
OVERALL Evesham makes some great mid-range PCs, but as far at this one is concerned there are better specced machines at a very similar price in this month's group test

PERFORMANCE RESULTS

	0	100	200	300	
SYSmark 2000					123

	0	1,000	2,000	3,000	4,000	5,000	6,000	
3DMark 2000								1,726

AJP 330C

If you're looking for a very fast notebook with Intel's Flip Chip, you can't go far wrong here.

The 3300C is the fastest notebook we have ever seen. The reason for this, though, is that it is not using a mobile chip, but Intel's 750MHz Pentium III in FCPGA form, better known as the Flip Chip. The disadvantages of using anything other than a mobile chip in a notebook are two-fold. First, it will generally run hotter, which was something we kept an eye on during the review, and second you will often suffer a shorter battery life. Strangely, when the 3300C arrived the battery monitor in the system tray reported that we were running on external power, even though the machine was not plugged in.

The 3300C is an attractive machine in brushed metal-coloured plastic and with a pleasant keyboard that is comfortable to use for extended periods. Our only complaint was the the 'Fn' key was positioned so that we kept on using it instead of the Ctrl key and affecting the actions of our cursor keys. The touchpad is responsive and positioned well so that you don't keep on tapping it with your thumb when you're typing. The screen stretches to a diagonal of 14.1in and has very even intensity, making it easy on the eyes. It's sharp, too, with a native resolution of 1,024 x 768 and seven intensity settings, controlled through the keyboard. This is driven by an ATi Rage LT Pro AGP chipset.

So what else do you get for your money? Apart from the super-fast processor, there's 128MB of RAM, which seems to be becoming standard in high-end notebooks these days, and should see the machine serving its user for a good few years without the need to upgrade. The hard drive runs to 12GB which, like the memory allocation, is a good size for a machine of this spec.

The body is not overly large, standing just 35mm from the desktop when in use, but even so it manages to squeeze in a good selection of components. Both CD-ROM and floppy drive are present, so there is no need to swap them around when alternating between media. There is no integrated modem so AJP has bundled an Apollo 56K Fax Modem PC Card. This sits in one of the two Type II PC Card slots running along the left-hand edge. Also on this edge, you'll find the port for a Kensington lock, which should keep the security-conscious happy.

As ever, most of the action happens around the back. Here you'll find the external power socket, parallel, nine-pin serial and external monitor ports. There's also a chunky connection for the docking station, a mouse and keyboard PS/2 combo port and two USB ports, which doubles what many other notebook manufacturers are offering. There's a blanking plate across the front of a 1394 Firewire port. It's a shame this was not implemented, and it would make this one of the few notebooks suited to digital video editing.

Sound is driven by an ESS Maestro chipset, through a set of fair internal speakers. There's a microphone set into the bottom of the screen, but if you'd rather get a better quality recording, then beside the CD-ROM drive you'll find jack sockets for headphones, microphone and line in.

In all, we were impressed with this notebook. It did not run nearly as hot as we had expected and was in fact much cooler than many other notebooks tested within the pages of this magazine. It was quiet and the primary input sources – the keyboard and touchpad – were both responsive and pleasant to use. Bundled software runs to only Windows 98 Second Edition, but there's a leatherette carrying case for use when you're on the move.

NIK RAWLINSON
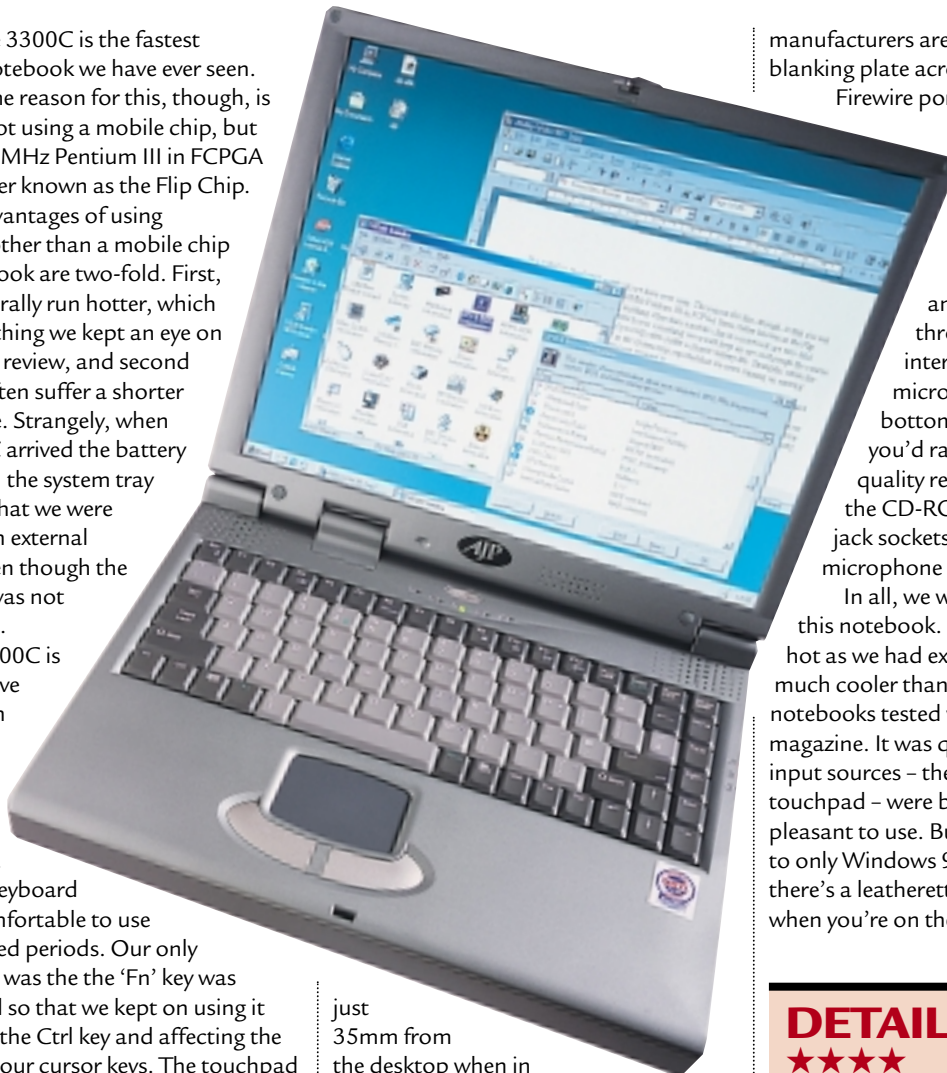
ACi Precedent

Desktop replacement notebook with a decent spec, but a high price tag to go with it.

If you think you've seen the Precedent before, you'd be right. It looks just like the Dell Inspiron 5000 we reviewed last month, and many before it, because both are originally manufactured by Taipei-based Compal Electronics. It is not unusual for notebook vendors to rebadge third-party products in this way, as the complexity of the manufacturing process far exceeds that of desktop machines.
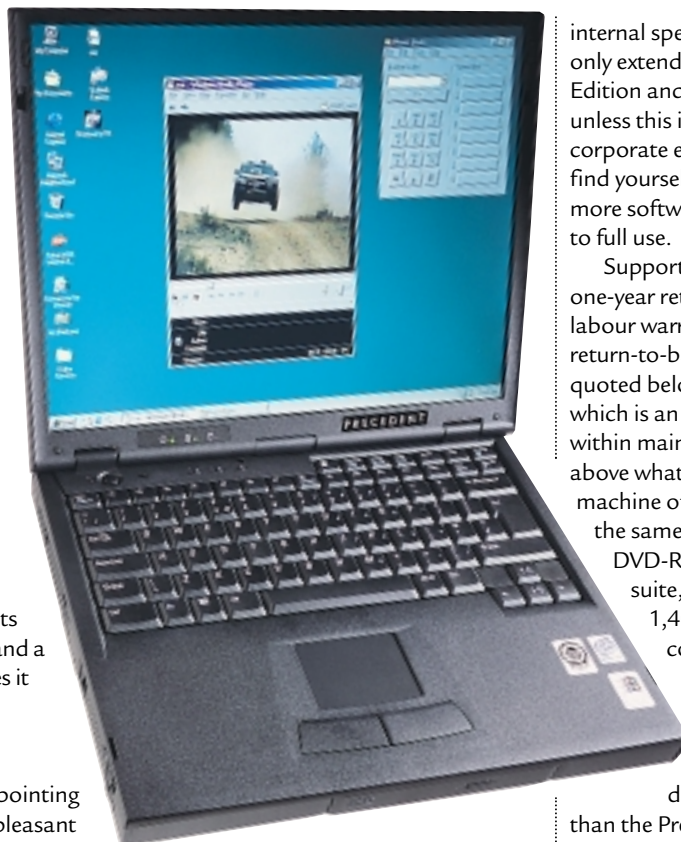
It therefore shares the Dell's slightly overhanging 15.1in screen design, but in this case with a native resolution of only 1,024 x 768. That said, it benefits from pin-sharp picture quality and a wide viewing angle, which makes it great for use in presentation situations.

Unfortunately, though, the Precedent suffers from a disappointing keyboard that is not the most pleasant to type on. The whole upper left-hand corner of our review model was loose and sunk into the body of the machine as we typed. This is no doubt a one-off, but even so the whole experience was fairly uninspiring.

We were also disappointed by the touchpad. This example was not as responsive as many we have used, but again we put this down to being a quirk of this particular machine and not the line in general.

The processor in this instance is an Intel PIII running at 500MHz, rather than the SpeedStep we saw in the Dell machine. ACi will upgrade this to a 600MHz PIII free of charge as soon as it is available. This is accompanied by 128MB of RAM, upgradable to a maximum of 512MB, and a 12GB hard drive that can be upped slightly to 14GB. Graphics are handled by an ATi Rage Mobility-P AGP chipset, with a dedicated 8MB of video RAM.

This notebook definitely falls into the 'desktop replacement' category as it's rather chunky and a little heavy. Weighing in at 3.3kg, you'll be more likely to use it when you reach your destination than while on the move, so it's probably not suited to anyone who likes to work on a plane or crowded train. It's about 2cm larger than A4 in both width and depth, measuring a healthy 324 x 259 x 43mm.

A quick tour around the edges of the machine reveals a plethora of ports and sockets. To the right there are two Type II or one Type III PC Card slots and the power supply. On the opposite end, there are volume control buttons, the floppy drive, audio jack sockets for line in, mic and headphones, and the socket of the mini PCI 56K fax modem.

The back of the machine, as ever, is where perhaps the most important connections take place, and here you'll find the docking interface, IrDA port, USB, keyboard and mouse PS/2 combo, as well as the parallel and nine-pin serial ports. There are also connectors for an external monitor and S-Video output.

The Toshiba DVD drive is at the front of the case, which makes access easy, and movie playback is handled by Mediamatics DVDExpress. Sound is handled by an ESS Maestro chipset and pumped through some surprisingly good internal speakers. The software bundle only extends to Windows 98 Second Edition and the software DVD player, so unless this is bought for use within a corporate environment you'll probably find yourself having to invest in some more software before being able to put it to full use.

Support comes in the form of a one-year return-to-base parts and labour warranty, followed by lifetime return-to-base labour support. The price quoted below does not include delivery, which is an additional £15 per unit within mainland UK, but even so it is well above what we would expect to pay for a machine of this spec. Dell will provide the same spec, but with slightly faster DVD-ROM drive, a bundled office suite, a native panel resolution of 1,400 x 1,050 and a one-year collect and return warranty for almost £300 less. Even upping the warranty to three years international next business day on-site doesn't make it more expensive than the Precedent.

A few months ago we might have been impressed by the Precedent, but, to be honest, it's too expensive to get excited about this spec.

NIK RAWLINSON

DETAILS
★★★

PRICE £2,673.13 (£2,275 ex VAT)
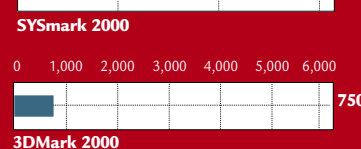**CONTACT** ACi 020 8357 1116
www.aciweb.co.uk
PROS Sharp image and wide viewing angle on panel
CONS Expensive, only 1,024 x 768 screen resolution
OVERALL If this machine had cost £500 less we would have been impressed, but at this price it fared poorly

PERFORMANCE RESULTS

0	100	200	300	
				101

SYSmark 2000

0	1,000	2,000	3,000	4,000	5,000	6,000	
							750

3DMark 2000

Intelplay QX3 Microscope

A practical and inexpensive USB microscope that is ideally suited to focus young inquisitive minds.

Following its US launch just before Christmas last year, toy giant Mattel will finally release the new QX3 Computer Microscope in the UK later this summer. The QX3 was produced for Mattel by Intel, and is an inspired educational toy that opens up the fascinating world of microscopy to PC users of all ages. It is a USB-powered device that captures microscopic, colour images at 512 x 384 resolution at a variety of magnification factors. The software allows objects to be viewed on a PC monitor in almost real time, and the images can be saved to disk, printed or manipulated. The picture quality is more than acceptable, given the targeted user and price bracket.

The microscope's magnification range is easily switched using a rotating lens control. The lowest factor (times 10) allows larger objects – grains of wheat, for example – to be inspected, while the medium range of times 60 is useful for observing sugar crystals, the surfaces of seeds, insects and other small objects. At the maximum times 200 range you can easily view fingerprint ridges, inkjet dots or even the hairs on a bee's leg. A button-push or mouse-click allows snapshots to be saved to disk, and time-lapse movies

Images, such as this sugar magnified 60 times, can be saved onto the desktop

of bugs or sprouting beans can be made by capturing images automatically at user-defined intervals. Slide shows of images can be played back as well.

The product has been thoroughly developed and is both simple and entertaining to use. It is moulded in translucent blue plastic, and focusing is achieved using large thumbwheels designed for ease of use by little fingers. Object illumination is provided by two

small bulbs, selected with the mouse: aerial lighting for solid objects, or a diffuse backlight for translucent samples.

The main microscope body is detachable to allow examination of objects in handheld mode, thanks to a generous USB lead. A set of sample slides is provided along with some small specimen jars and containment dishes, tweezers and an eyedropper, all moulded in safe plastic with no glass in sight. The Activity Book completes the kit.

The specification requires a minimum Pentium 200MHz with 32MB of RAM and 75MB of hard disk space, CD-ROM, 800 x 600 video and 16bit sound, with USB and DirectX support.

The software installed almost flawlessly, although the routine stopped midway. This was because a registration form was hidden behind the main install window, but once dealt with, the installation finished successfully.

Switching to 'live' mode opened the image window, where the light source could be selected. Real-time viewing may depend on the performance of the host PC, but time-lag was perfectly acceptable in practise. Image contrast and brightness settled down automatically after a few seconds and the camera responded in virtually real time, making object positioning and focusing generally easy. The image quality was surprisingly good, and by using Paint Shop Pro to view captured JPEGs in full-screen mode, we were presented with quite reasonable colour shots. Additional lighting (a penlight with a light guide, for example) may sometimes help.

The Intelplay software is marvellous fun and allows a whole raft of special artistic effects to be applied via the versatile paint package, accompanied by some great sounds. Mattel's QX3 may prove ideal for junior scientific experiments, classroom nature studies or field trips, perhaps running on a laptop computer. It is fascinating and good fun, and is bound to captivate the enquiring minds of young and old alike.

If you can't wait for its summer launch, the microscope can be ordered online from the US through Electronics Boutique at **www.ebworld.com**. Amazingly, ours arrived in less than 72 hours (perhaps not surprisingly, as the shipping cost $35); be ready also to pay the courier for import duty. Overall, the QX3 microscope is a marvellous innovation for children and parents, and deserves to be high on the wish lists of inquisitive youngsters this year.

ALAN WINSTANLEY

DETAILS
★★★★★

PRICE $69.99 plus $35 shipping, five-day delivery from US, import duty and handling approx £25. Available in the UK in August, price approx £99 (£84.25 ex VAT)

CONTACT Intelplay (**www.intelplay.com**), EBWorld (**www.ebworld.com**), Mattel Interactive 01664 481 563

PROS Enjoyable, educational, creative and thoroughly developed

CONS Some will prefer a higher image resolution, replaceable bi-pin bulbs are currently a specialist item

OVERALL An inspired scientific toy – if the grown-ups will move over a second

RECOMMENDED
PERSONAL COMPUTER WORLD

Pinnacle DV500

A competent digital video-editing package that will suit occasional users and professionals alike.

Pinnacle offers a wide variety of video-editing packages, from the cheap and cheerful to the highly professional. The DV500 represents the midrange at £599 ex VAT, and boasts real-time native DV editing with 3D effects, that will easily satisfy enthusiasts along with many professionals.

The package consists of a single PCI card, an external analog input/output box and a wealth of software. The card features three 1394 ports (also known as Firewire or iLink), that are used to connect DV camcorders or decks. Most DV camcorders feature a 1394 DV socket that will digitally send out a signal, but you'll need a model labelled DV in/out to receive a signal back again for digital recording.

The external box features composite, S-Video and stereo audio connectors for both analog input and output. The software includes Minerva Impression CD-Pro (for creating short-length DVD-style projects on CD-R), Sonic Foundry Acid (for audio), TitleDeko (for titling) and full Adobe Premiere 5.1 with Pinnacle's own dedicated real-time plug-ins. Pinnacle's DV tape scanning, capture, control and printing utilities complete the package.

Uncompressed PAL video is an unwieldy beast, measuring around 25Mbytes/sec, so some kind of compression has to be employed to make it more manageable. It's down to a CODEC to compress video during capture and decompress it again for playback, and this can be done in software or hardware. Even in this day and age of super-fast CPUs, you're still going to need a hardware CODEC to achieve anything near broadcast quality.

Most video capture devices employ a hardware Motion-JPEG CODEC, which uses JPEG compression on each frame to achieve smaller file sizes, while retaining editing capabilities. Pinnacle's DV500 cunningly employs a hardware DV CODEC, similar in theory to M-JPEG, but in practise, identical to the system used by DV Camcorders. This means the DV500 captures clips from analog sources in the DV format, ready to put straight into your DV Camcorder without the need for lengthy format conversion. Obviously clips captured from DV sources are also kept in the DV format, allowing you to mix digital and analog material without conversion.

That's clever in itself, but the DV500 goes one step further. Pinnacle includes a range of transitions and effects that can be applied in real time, without the need for time-consuming rendering in Premiere. Under the right circumstances, you could capture video from analog or DV sources, edit and apply specific effects, and immediately print it directly to DV tape. Your work is also output to the analog connectors, which could be feeding an analog VCR or TV monitor. The 3D transition effects are also very good, and these would normally require lengthy rendering in software or need specific hardware support. The DV500 cleverly uses any existing 3D graphics card to accelerate the process.

Pinnacle recommends using Windows 98/NT/2000 on at least a 333MHz PII with 128MB of RAM and plenty of free disk space. The DV format is fixed at 25Mbits/sec, which works out at 3.6Mbytes/sec. That's the speed your hard disk will need to sustain, and you're also looking at 200Mbytes/minute or around 12Gbytes/hour of material. The DV500 supports files up to 12TB.

We captured analog clips from VHS, LaserDisc and off-air using the S-Video and composite connectors. A Canon XL-1 Camcorder provided DV material. We merrily edited our project in Premiere and output the entire thing both to an analog VCR and digitally back to the XL-1 over 1394. Admittedly some effects required rendering, but by keeping everything in the DV format, we faced the minimum of fuss.

The DV500 also offers an export to MPEG-2, the native format of DVD. Our 128MB PIII 550MHz took 25 minutes to convert an eight-minute 1.79GB AVI project from DV into a 527MB MPEG-2 file (442MB video/85MB audio). This was done using a variable bit rate with an 8Mbits/sec video peak to match the DVD specification. Minerva Impression CD-Pro could then write this high-quality, eight-minute video onto a recordable CD with DVD-style menu graphics.

It's certainly an impressive package. While the £199 StudioDV reviewed in March will be sufficient for DV sources only, the DV500 covers just about every base for projects involving analog and digital material. Using the high-quality DV CODEC for both analog and digital sources is inspired, and the MPEG-2 export is a welcome bonus.

GORDON LAING
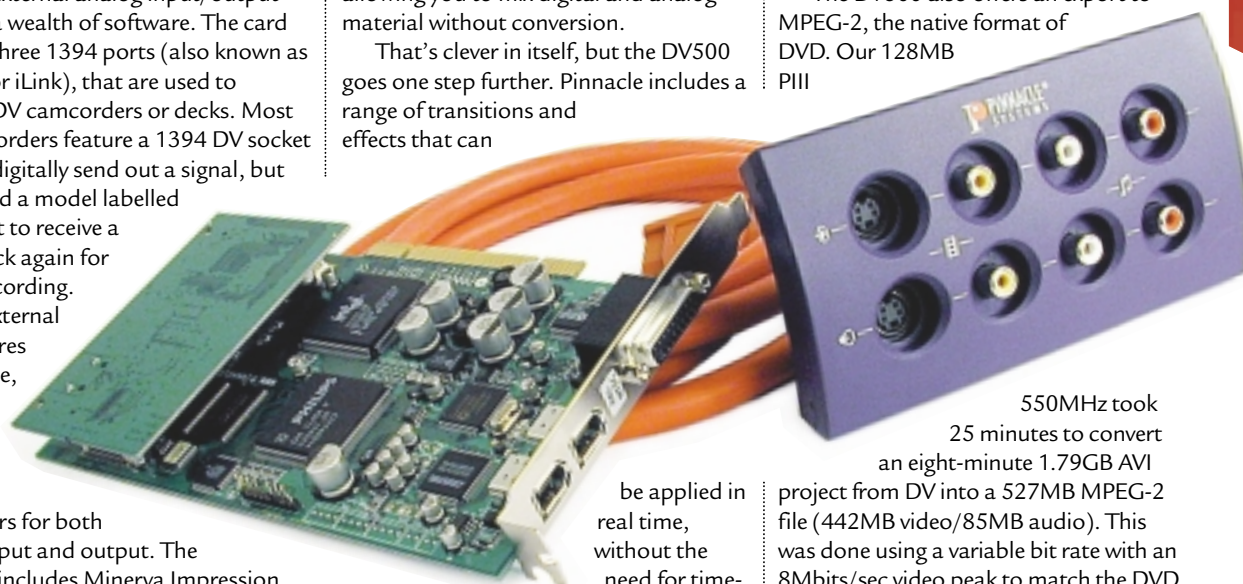
DETITALS
★★★★★

PRICE £703.82 (£599 ex VAT)
CONTACT Pinnacle Systems 01895 442 003
www.pinnaclesys.com
PROS Real-time editing in the native DV format
CONS You'll probably still need to render some elements
OVERALL The perfect package for editing digital and analog sources

Quantum Snap! Server

A network-attached server that provides 20GB of backup storage, as well as organising a RAID.

Storage is one of those areas of IT that, in our opinion, should take up the minimum amount of time and resources. True, the implications of not following the necessary backup procedures will often lead to disaster, but this is not to say that it should be a complex routine.

Recognising this, a host of storage companies have been jumping on the network-attached storage (NAS) bandwagon. The latest of these is Quantum, with its Snap! Server. The model we tested provided 20GB of storage, and can be attached to any point on the network in, literally, a matter of minutes.

After setting up a simple test network consisting of two Windows 98 clients and an NT server we connected the Snap! Server to the same hub. The Server has an internal 10/100 auto-sensing network interface card (NIC), so no matter what speed of wire you use it will work.

Ironically, the most drawn-out process we had to endure when setting up our storage was physically switching it on, as it takes a couple of minutes to initialise and run through its hard drive checks. By default the server is called SNAP, followed by the serial number of the box – and after performing a 'Find Computer' search on this our storage was found with no further problems. With the server safely located in our Network Neighborhood we could begin to copy files – as simple as that!

Finding the server is one thing, but configuring it is another, and the box comes with very little configuration as default, so some time is needed to set up details such as disk settings and security. We found it strange that the server came set up with no security, as giving it 'Administrator only' rights may have reduced the risks if security, for whatever reason, gets overlooked.

Configuration is handled by a program, supplied on CD, called Snap Assist – and this provided a diagrammatic view of all the servers on our network. After selecting one, we could then launch the browser-based management console. Our first impression of the management interface was that it was a bit simplistic, with no real opportunity to drill down into

greater detail. Quantum has clearly gone for ease of use, the result being a rather scant-looking main screen display. It consisted of Quick Configure, Server Settings, Network Settings, Security, and Disk Utilities.

Because no security was in place, we felt that this would be a good place to start. Snap! Server allowed us to set up basic security settings, such as network shares and passwords. All the users that are actively logged into the server can then be viewed in real time, with information on whether they have read or write privileges.

We set up two network shares, giving each access to a separate drive, and sure enough we couldn't access the drive we were not assigned to. Although this sounds a little over simplistic, it does provide a decent level of security.

By default the server is also set up to obtain its IP address through DHCP (Dynamic Host Configuration Protocol), but we opted to assign it a static – and therefore permanent – one instead. This is a simple process, and is carried out through the Network Settings module. It is worth considering that to use the browser-based management you must assign the box a static IP address.

Our model of the Snap! Server comprised two physical drives, which can be set up in three different ways, depending on your needs. Each disk can be set up separately of each other which, although a little more complicated to manage than one disk, can provide you with an additional level of security.

Of more interest than this, however, are the other two ways of configuring the disks. You can combine the two disks into one logical drive, also known as disk striping or RAID level 0. There are two advantages to this configuration: management will be simplified as you only need set up a single network share;
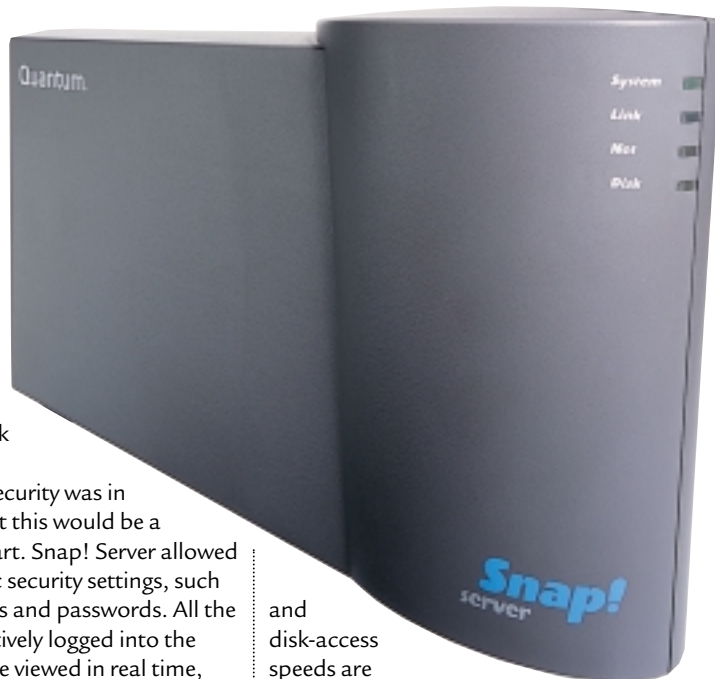
and disk-access speeds are improved.

The final method is to set one of the drives to automatically back up from the other, which is also known as disk mirroring or RAID level 1. Although this reduces your storage by half, the extra fault tolerance could well appeal to many users who are looking to store sensitive and important information.

Overall the Snap! Server is probably the simplest approach to additional storage that we have come across. The ability to add 20GB to your network in a matter of minutes, and still benefit from the advantages that RAID 0 and 1 provide is extremely attractive.

DAVID RAE

DETAILS
★★★★

PRICE £851.88 (£725 ex VAT)
CONTACT Quantum (01344) 353 500
www.quantum.com
PROS Very simple and quick to install and manage, relatively cheap
CONS Some may feel that the management console is over simplistic, set up with no security by default, its odd shape means that it can't be stacked
OVERALL Its strength lies in that it takes almost zero installation and configuration, and for the price is an attractive product

C Technologies C-Pen 600

A handy device that saves you retyping your notes and stores 1,000 contacts, but is fussy about fonts.

Billed as a PDA that also offers printed text translation and OCR capabilities, the C-Pen 600 looks like an oversized pen. This clever device lets you scan in lines of text that can then be transferred via an infra-red port to your laptop or desktop PC. It has a tiny scan head built into the 'tip' of the unit that can scan 100 characters per second in seven to 20-point fonts. An Intel StrongARM processor provides the computing power and the 6MB of Flash memory is capable of storing around 2,000 pages of text. As far as its PDA qualities are concerned, the C-Pen offers storage of up to 1,000 addresses and phone numbers, and a memo pad facility. We're not entirely convinced that this qualifies it as a PDA, but weighing just 80g and being only slightly larger than a highlighter pen, it is certainly a handy portable tool for looking up the odd address.

The 600's main function is using OCR (optical character recognition) to convert printed text into an editable electronic form. It can also translate words in English, French, Spanish, Italian, German and Swedish. Eleven languages can be read, with all the extra character support that these require. It is the C Dictionary function in the C-Pen that allows two-way translation between two languages, and you can choose one dictionary from the CD to download onto the 600. So, you could choose the French dictionary

have read directly to the cursor position in Windows, making the C-Pen extremely quick for short quotes, timetables or anything else you don't want to retype from a printed page. With C Write you can use the 600 like a normal pen, except the characters you write appear on the four-line dot matrix display. This function can be used to edit scanned text or write short memos.

Scanning text is a simple process of placing the C-Pen flat against the paper and dragging it across a line of characters. These then appear on the screen, with further lines appearing right after the previous ones.

Luckily, you can set the device to left or right-handed mode, something we're pleased the designers thought about, as operating the device with your 'wrong' hand is not a pleasant experience.

Almost all the functions and the menu navigation are controlled with the rocker switch on the top of the unit and even though the screen is fairly small we still found it intuitive and easy to use. One gripe, though, was that the switch would often get stuck down when we

colours and the results varied as much as our tests did. The manual states that the 600 may not be able to correctly recognise italic or underlined text, and definitely won't work on handwriting. Coloured paper or text was also said to be problematic, with the ideal conditions being laser-printed text on white paper. After the quick calibration process, we saw good recognition on plain text with virtually no formatting, but the 600 had problems recognising complete lines when some words were in bold or fonts were different. Fax pages were also a problem, as the reduced text quality meant certain characters were consistently misinterpreted.

We also found that sans-serif fonts were more accurately recognised than serif fonts, while the top speed at which the C-Pen was able to correctly recognise text felt a little slow. Editing text was not a pleasant experience and this process is best carried out once the text has been transferred to the laptop or PC.

JIM MARTIN

You could choose the French dictionary for translating from French to English and vice versa

for translating from French to English and vice versa. Additional dictionary licences can be purchased as and when you like.

C Direct lets you transfer text you

attempted to select menu options, and as it is also used as the on/off switch, the 600 would keep turning off accidentally.

We tested the device on a variety of different fonts, formatting styles and

Diamond Rio 500

A resilient MP3 player that is quick and easy to use, but the case could do with a bit of a makeover.

Rio is perhaps the best-known name in MP3 hardware and the Rio 500 is the latest in an evolving line of players. This version has 64MB of internal memory (upgradable using SmartMedia) and connects to the PC via USB, ensuring speedy uploads.

We uploaded an entire album in MP3 format in about three minutes, using the bundled RioPort software. Music is stored in folders for easy navigation, and if you're using it to store spoken audio you'll welcome the addition of a 'bookmark' button – to find your place the next time you switch on. The alternative would be rather frustrating – listening to the track from the start again.

The front-mounted display panel is quite simply the best we have seen. The resolution is excellent, which may not seem that important, but when you've used it you'll see why it puts the competition to shame. It's a robust unit, too. During testing it got dropped on the floor, and the force was enough to open the battery compartment and knock the battery out, but the player suffered no damage and was back in use within seconds. A wheel selector on the right-hand side of the unit navigates the comprehensive menus and adjusts the volume, making this device more user-friendly than much of the competition.

With the look of brushed metal, it's very smart and about the size of a pack of cards. It's a shame, then, that the carry case is one of the worst examples of bad design we have come across – a fusion of fishnets and board that spoils the 500's good looks. Unfortunately, it also has no radio or voice recording facilities, but if you want the most stylish MP3 player around this has to come close. Earphones are a bundled bonus.

NIK RAWLINSON

DETAILS
★★★★

PRICE £169 (£143.83 ex VAT)
CONTACT Diamond Multimedia
01189 444 477 **www.diamondmm.com**
PROS USB connection, good looking, great menu structure and navigation, 64MB built in
CONS Awful holster, no radio
OVERALL If you only want to play MP3s you won't go wrong here, it could be a bit smaller, though

AvSys AvOffice 800S

An excellent performer that brings Ethernet switching into the realms of the small business.

The demand for PC-based networks in the small-business sector is growing so fast that there's now a huge range of budget-priced products to choose from. This is the same for dual-speed Ethernet switches, and the AvSys AvOffice range stands out thanks to their smart VFD (vacuum fluorescent display) panel. Visual impact aside, the VFD provides plenty of information about switch operation and network statistics. Using three buttons alongside the panel, you can access switch settings and modify them directly. This is a great time-saver, as most unmanaged switches require a serial port connection to a dedicated PC.

The 800S is the baby of the AvOffice range and offers eight dual-speed auto-sensing ports, which support half or full-duplex modes. A ninth port is provided for linking other switches or hubs, to increase the number of available ports. The 800S can store 8,192 MAC addresses in its forwarding table and uses either fragment-free or store-and-forward switching modes. It also supports up to eight VLANs (virtual LANs) so PCs on different segments can access each other as though they were on the same wire.

Despite its diminutive stature, the 800S has some powerful hardware under the bonnet and uses 1.5MB of fast SSRAM (synchronous static RAM) for port buffering. This delivered an impressive performance when we hooked the switch up to a SmartBits SMB-2000 switch tester. The 800S only lost frames when the simulated traffic was up to 100 per cent – a load that small businesses are unlikely to generate.

Overall, the 800S offers some quality hardware and is a good choice for small companies that need Ethernet switching.

DAVE MITCHELL

DETAILS
★★★★

PRICE £328.99 (£279.99 ex VAT)
CONTACT IMC 01344 871 329
www.avsys.com
PROS Quality switching hardware and top performance
CONS Most small offices won't see any benefits from Ethernet switching
OVERALL A good entry point into Ethernet switching with a good management display

Microsoft Project 2000

The ability to organise all aspects of a project down to the finest detail is invaluable, as is this software.

Project is Microsoft's fourth-biggest-selling product and is the best-selling project-management software worldwide. Project management software is a way for businesses to organise anything from the construction of a building to the manufacture of a product. The software produces diagrams that show in which order tasks need to be accomplished and how long it is estimated they will take. Project managers use two common ways of displaying a project: PERT diagrams and Gantt charts. Project 2000 supports both and, additionally, offers a calendar display, rather like that offered by Outlook. Project 2000 is a major step forward for large businesses, offering better facilities for workgroups, but with improvements for the single user, too.

The main addition is for companies with groups working on the same file, rather than small businesses. Project Central, a 'web-based companion' to Project 2000, allows users to access projects through company intranets. The project manager, using a full copy of Project and a copy of Project Central Server, produces the plan and publishes it separately to the Project Central database. Other people in the company can view it and propose changes (which includes the creation of tasks and subtasks, updating the percentage of a task completed and delegating tasks to other workers). These proposed changes are received by the project manager as messages that they can approve or reject. Depending on how access privileges are set, Project Central can automate the acceptance of alterations, saving the project manager more time.

Project Central users who also store

information in Outlook, benefit from integration between the two packages. Tasks in Outlook can be imported into Project Central, informing the project manager of scheduled meetings and the like. This increases accuracy in allocating personnel resources, by keeping track of who may be working on non-project-related activities.
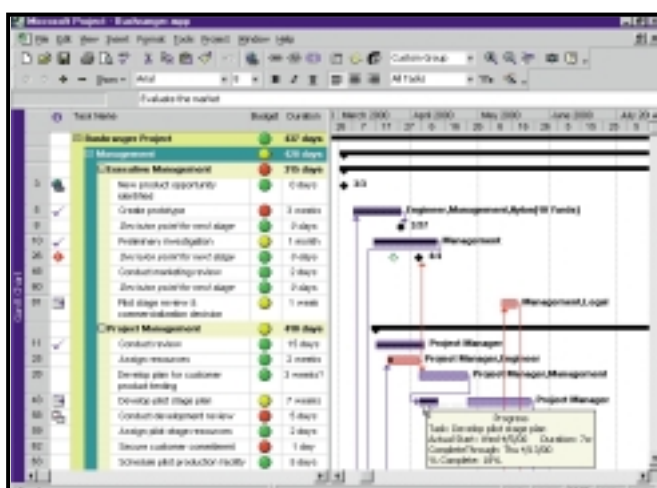
Project 2000 showing a Gantt chart

Key to Project's appeal is that it offers an Office-style interface, making it easy to learn. This version's interface has been updated to fit in with Microsoft Office 2000, with menus that can show the most-used options and then expand to show all the options, for example. Features can be installed 'just-in-time', so they are only copied onto your hard drive the first time they are used.

Many parts of Project 2000's interface have been tidied. In previous versions, it was necessary to enter information into an edit bar at the top of the screen. Now it works like Excel, where data can be typed directly into a cell. Project 2000 has a clearer help system, now using an HTML design. Individual rows can now be set to different heights, and if too much text is entered into a cell, the row height adjusts and simply wraps onto the next line. In the Gantt chart view, clicking on a Gantt bar now selects the task and highlights its description on the left of the screen, making it easier to see what you are working on.

There are many minor improvements. The ability to group together tasks and

resources has been added. This, for example, means that you can see the cost associated with each resource group. Baseline and interim plan data can be cleared easily. Handling of custom fields has been bettered; unlike in previous versions of Project, these fields can now be validated. Options may be chosen from a list, and formulae may be used to perform calculations. Graphical indications have been added to highlight when values in custom fields may cause problems.

Publishing charts on the web is made easy now that Project supports Office Server Extensions. As in other Office 2000 programs, saving to web servers that support Microsoft Office or FrontPage extensions is straightforward.

Project produces good-looking reports, but it still lacks flexibility. For internal use, it may not really matter what a charts looks like, but it would be good if a company logo could be added to a report's heading, for example. Printing has been improved slightly, letting you set the first page number, which is handy when binding more than one project.

Project 2000's price represents its sophistication, and while small business users may be better going for a cheaper product, this is an excellent package for workgroups.

ALEX SINGLETON

MYOB Accounting

A highly affordable and comprehensive financial-management package aimed at small businesses.

MYOB (Mind Your Own Business) is a simple to understand and highly efficient accounting and business management system aimed at small businesses of up to 25 employees with a maximum turnover of £5m, and is suitable for single or multi-user setups. It is a fully integrated, double-entry accounting solution with all the usual features, as well as payroll, job costing and, in the case of the Accounting Plus version, full multi-currency accounting.

Everything is laid out in a logical sequence with the accounting and computer novice in mind. The Command Centre provides a single menu giving access to all parts of the program. Each time you click on one of the seven Command Centre buttons a new flowchart is displayed. These explain the accounting procedures that take place in that area and in what order.

MYOB has been created with the businessperson, rather than the accountant in mind. The nominal ledger, for instance, offers 100 different types of account chart, fully customised to a variety of businesses – or you can create your own. Although this is a complete, double-entry system, unlike most other packages, all the accounting is done in the background, so it really doesn't matter if you are a complete novice.

We particularly liked the Card File section. From here it is possible not only to view all your suppliers, customers, employees and personal records, including current balances, at the touch of a button, but it is also easy to mail-merge contact information into Word or WordPerfect to produce overdue reminders and marketing information. Cards can be grouped together by applying identifiers, making it possible to track, among other things, all contacts in a particular area or suppliers offering a similar range of products.

Stock control is superb. with at-a-glance stock levels, most recent purchase and selling prices, and the Stock Alert tab in the To Do List shows you each item on which you have over-committed. Just a simple click on the Order arrow creates a purchase order, or on the Build arrow builds a stock item, followed by a further click in the Action column. As soon as the
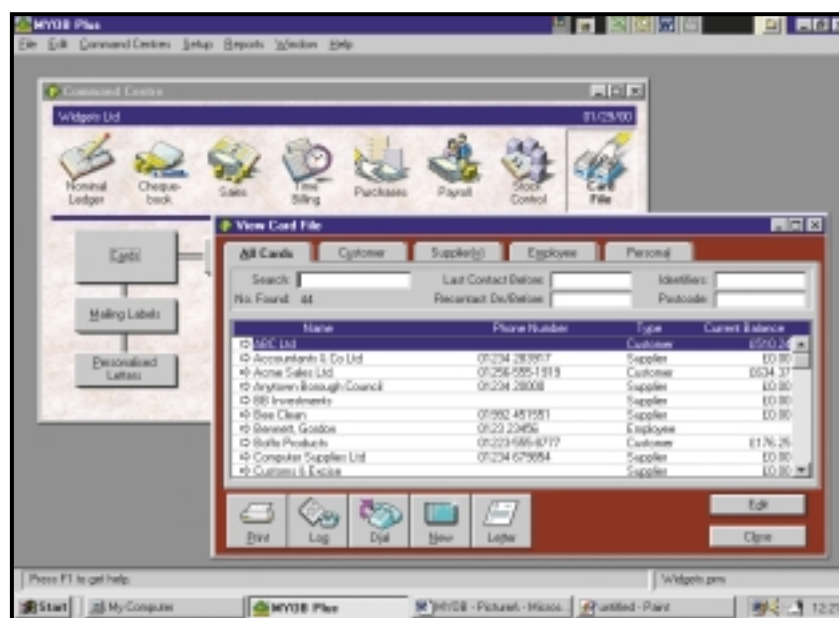
The Card File section allows you to see current balances at the touch of a button

item code is entered details of pricing appear and the purchase order is created.

When preparing sales invoices and purchase orders you are prompted to make a choice of layout depending on the product and each is clearly identified with a sample to view. This latest version of MYOB lets you choose the debtor settlement periods to suit your business, although the default 30, 60 and 90-day intervals are still there. Expandable description fields enable you to display a greater level of detail.

The Chequebook Command Centre handles the paying out of money via cheques, cash, credit cards and other means, and all balances are updated as soon as the transactions are recorded. When creating a cheque, MYOB's easy-fill feature finds the match as you type in the details and completes the payee's name and address details. You then select an expense account to which the payment refers from the list of nominal accounts available on pressing the tab key.

High-quality graphics allow the easy integration of logos and images into customised forms. Data can be transferred into Word and Excel and this has been extended in version 8 to include Word and Excel 2000.

All this, together with an efficient payroll system, VAT control, debtor and purchase order tracking, job costing and time billing facilities, make this an extremely well-designed and user-friendly package for small businesses, and all at a highly affordable price.

SHEILA FRANKLIN

DETAILS
★★★★★

RECOMMENDED PERSONAL COMPUTER WORLD

PRICE From £229 (£195 ex VAT)
CONTACT MYOB 01752 201901
www.myob.co.uk

SYSTEM REQUIREMENTS Pentium system with 16MB of RAM, 41MB of available hard disk space and an additional 35MB (average) for each data file. Windows 95, 98, NT4 or later. Macintosh – PowerMac with 16MB of RAM running Mac OS 7.5 or higher

PROS Nominal ledger section headers show section totals at a glance as well as individual account balances within those sections. From the Command Centre you are guided through flowcharts which explain the accounting procedures in each section

CONS On-screen help could be a little easier to find, but the manual is detailed and the comprehensive 90-page index makes it easy to find the answers to your questions

OVERALL A very good package for the businessperson who is not an accountant but wants to control the company finances without the help of a full-time professional

Serif Page Plus 6

**Upgraded DTP package with improved wizards and help for those new to web design.**

For those new to DTP (desktop publishing), only one question needs answering when considering which package to buy: does it better MS Publisher 2000, which took the Editor's Choice award in *PCW*'s March software group test?

The first change in this version of Serif Page Plus is in the way the wizards work. A template browser provides a good look at what's available – select a template category from a list on the left and the options are thumbnail previewed on the right. The quality hasn't improved though, and while you might be happy with the party invites, this stuff won't do much for your business image.

With your template opened you enter choices in a wizard panel to the right of the editing window. With business templates this typically consists of company details, document title and colour scheme. Once you have entered these details, they are usefully saved for automatic entry the next time you use a wizard.

The wizard panel sits in a tabbed window called the Studio Bar, that you can access at any time to make retrospective changes. Other occupants of the Studio Bar are the colours palette, colour schemes, text, lines, gallery and portfolio panels. There's a good range of colour schemes, each consisting of five swatches. They aren't always applied to the template particularly intelligently though. On the price list for example, the
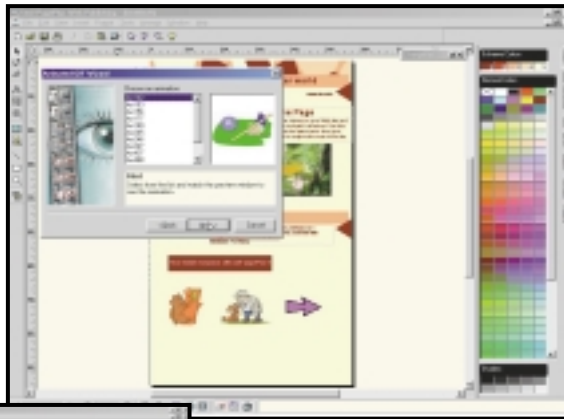
The new, improved template browser
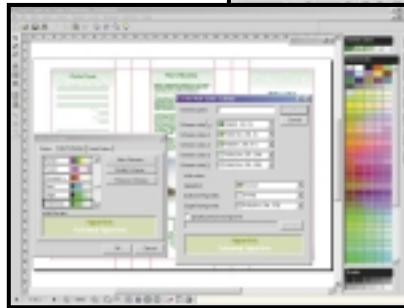
Colour schemes are fully editable

colours through a colour manager tabbed panel. This also allows you to add individual Pantone, spot and process colours to the palette. One good feature is the tint panel at the bottom that displays percentage tints of the currently selected colour.

The text panel displays a scrolling list of text style sheets at the top and, underneath, a list of all available typefaces, each displayed in its own face. As with the colours, stylesheets can be edited by right-clicking within the palette to access the text-style palette. This is a little clunky as you have to pull up additional dialog boxes to edit character attributes, spacing and alignment, tabs, drop caps and so on. Applying styles is simple enough though – just highlight the text, then click on the style, or drag and drop. A keyboard shortcut would have made a good alternative.

Text and graphics handling has been greatly improved. There are no fewer than 27 new graphic shape tools, including triangles, stars, polygons, lightning bolts and jewels. And the standard text frame has been joined by 18 not-so-standard shapes, including ovals, round-cornered boxes, polygons and hearts. When you draw a text frame the same dialog box-based wizard as in version 5 (or one very like it) lets you select column, margin and border options.

For those with little or no experience of web design and production, Page Plus' web wizards will provide a quick, if not aesthetic solution. There is a library of 600 animated GIFs – mostly cartoon-style animations. You can also insert sound and video clips, Java applets and HTML code, although none are provided.

Other improvements include support for spot and process colour printing using a professional print wizard, and multiple documents. The excellent Logo Plus and Table Plus remain in their version 5 format, now included on an old fly-out tool along with the calendar and Draw Plus applets.

Better than MS Publisher 2000? No. But a big improvement on a package that still has a lot to offer.

KEN MCMAHON

Applying styles is simple enough – but a keyboard shortcut would have been good

same colour is used for both the body text and the graphic at the top of each page when there are other, unused colours available.

You can edit the schemes and swatches on the colour palette and web

The Gallery consists of 3D text effects, logos, mastheads, background, flashes, coupons and so on, that you can drag and drop onto the current publication. You can also quickly ungroup objects and edit them.

Mixman Studio Pro and P-Mix hardware controller

A touch of class in the click-and-create music world but the accompanying P-Mix is too expensive.

There's an old saying that everyone has at least one good book inside their head waiting to be written. Mixman obviously believes the same adage applies to composing music. But while most of us can string a few words together, not quite as many can coax a tune from an instrument.

Mixman's answer is to give budding composers snippets of music to arrange into something new. Some may scoff, but DJ Shadow, the man often described as the Jimi Hendrix of the sampling world, makes a healthy living and enjoys critical acclaim doing just this.

When you load up the software you are offered a choice of four windows. The first has two turntables with animated stylus arms. This is where you can play Mixman 'live'. Within the turntables are eight buttons – click on one of these to load and assign a sample to it. Each button is mapped to a key on your keyboard. Hit the Record button and you can start mixing the loops in and out by holding and releasing these keys. If you want a loop to play continuously just press the key on the keyboard and hit the space bar. To stop the loop repeating you simply repeat the same process.

The arrange page is given second billing, mainly because Mixman wants you to use the live DJing elements as the primary arrange tool. This is no bad thing as playing loops live is more intuitive than arranging them as blocks on the screen. But don't be fooled into thinking the arrange window isn't as comprehensive as those in other products – it is.

The third window is the effects studio. This lets you apply up to five effects to a loop simultaneously and save the results for loading into the DJ window. There is a huge range of effects, from simple echoes to complex comb filters, which greatly enhance the sonic palette of the software.

Last is the recording studio where you can record and edit loops or vocal samples. You may not need to start recording your own loops for a while, though, as the ones bundled with Mixman are probably the best set of samples included with any of the click-and-build music packages. This isn't surprising as they are all culled from professional sample CDs.

Despite the good points there are niggles. You can't load samples on-the-fly while in play or record mode. You have to stop, load the samples and then hit play again. It's a minor quibble, but irritating nonetheless. There's also no way to automate effects from the arrange page. Once recorded into a song they stay there, so you have to be sure of your entire arrangement before you start to apply effects. Otherwise you'll have to reconstruct sections in the arrange page because you can't get rid of the effects that were recorded with the loops.

Apart from these quibbles Mixman is a fine product. It's easy to use, the samples are well chosen, and the effects mean you can create endless variations on either the bundled samples or those you record yourself. Not only that, but your finished tunes are likely to sound much more professional and less cheesy than those created on rival products.

Spacetoys, UK distributor for Mixman products, also sent us the P-Mix controller, designed and built for use with the software. It plugs into either the USB slot or the PS/2 keyboard connector and has a dedicated button for almost every function in Mixman. The controller feels much more natural than a standard keyboard. But it also has a flimsy feel and looks like a child's toy. And at £99.95, almost twice the price of the software, it's just not worth the money.

NIALL MAGENNIS

Mixman offers a choice of four windows, from turntables to effects

DETELS

★★★★

MIXMAN STUDIO PRO
PRICE £59.95 (£51.02 ex VAT)

★★

P-MIX CONTROLLER
PRICE £99.95 (£85.06 ex VAT)
CONTACT Spacetoys 0141 634 0996
www.spacetoys.net
SYSTEM REQUIREMENTS Windows 95/98, Pentium II 200MHz, 32MB RAM (64MB recommended), Direct X-compatible sound and video cards, 35MB hard drive space (275MB to install with audio), CD-ROM drive
PROS Mixman outdoes many competing products, and it's intuitive
CONS P-Mix controller is too expensive
OVERALL Mixman adds a touch of class to the often cheesy world of click-and-create music tools. Just don't opt for the P-Mix controller at its current price

Macromedia Freehand 9

If you want a flexible and versatile graphics production tool, this one could be for you.
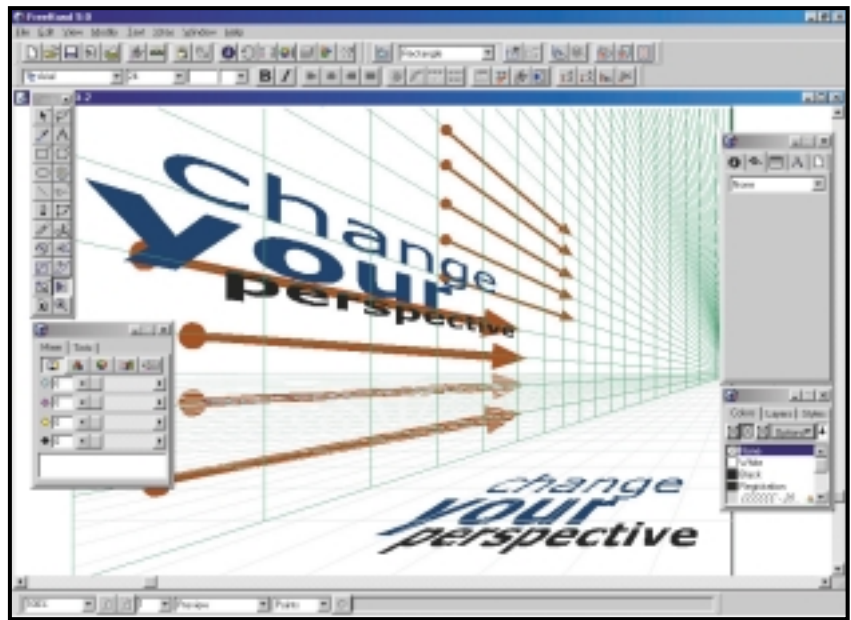
Like layout applications, bitmap editors, and web-authoring tools, vector-drawing applications used to compete head-on for market share on the basis of features. One year Illustrator users were top dogs, but with the next release of Freehand they were the ones holding the blunt pencil.

Now, both Adobe and Macromedia concentrate more on integration – making sure their products take advantage of proprietary technologies and leveraging the capabilities of other applications in the corporate portfolio.

So perhaps it's no surprise that Macromedia is positioning Freehand 9 as the vector graphics package with everything for the web designer, providing that Flash – its vector-based web graphics format – is your preferred medium.

Flash support includes auto-generation of layer-based Flash animations, static and animated Flash .swf export with full-screen, autoplay and import protection options. A Flash preview mode saves you the effort of having to export and view files in the Flash player to see what they look like.

Which is not to say that there are no new features on offer. Perspective grids, live enveloping, magic-wand tracing and a new lasso tool extend Freehand's capabilities and speed up the production process. Page and layer management have been improved, as has Freehand 8's

Getting the right perspective – a big timesaver if you need to write on the floor and walls

A Flash preview mode saves the effort of having to export and view files in the Flash player

severely limited 'autotrace'. Furthermore, you can export to Photoshop with layers intact and there's support for PDF export.

Perspective grids are such a fundamental drawing tool it's surprising no attempt has been made to implement them before. You can set up a perspective grid with up to three vanishing points. Objects, including type, can be snapped to the grid whereupon they adopt the appropriate perspective distortion. Objects automatically scale as you drag them towards or away from the vanishing point and change perspective as you move them along the grid.

Objects attached to the grid automatically update. If the grid layout or perspective is changed you just press the shift key while manipulating the grid. If you don't do this then objects lose their link to the grid. The perspective tool doesn't currently work with bitmaps. If Macromedia can add that capability in the next version, it will be an even more impressive and very powerful feature.

Envelope distortions are nothing new, but Freehand 9's new tool is more sophisticated and flexible than what has been available before. Freehand allows you to apply preset envelope shapes to virtually any object, with the exception of bitmaps, and edit or apply your own. Text remains editable after the distortion has been applied, although applying more than one envelope distortion to text, and 'releasing' the type from its distortion envelope causes it to be converted to paths, and therefore prevents further text editing.

Autotracing of bitmapped images to produce vector art is something of a dark art that requires careful manipulation to achieve good results. Even using the best tools available – Adobe Streamline and Corel OCR-Trace – a lot of manual post-processing is always necessary.

A new magic wand selection tool, combined with an integrated autotrace function, provides a workable alternative to third-party utilities. The magic wand functions in exactly the same way as in any bitmap editor, selecting contiguous pixels of similar hue and brightness, depending on user-defined tolerance levels. There are, however, no advanced features such as Photoshop's 'similar', or 'grow' commands. You click once with the tool to select and a second time to bring up the wand options dialog. The purpose of this is to choose between a straightforward selection trace or 'convert selection edge' which forms a path only from the outer edge of adjacent shift-selected areas.

To autotrace an entire image, you simply drag around it with the wand. The trace uses the parameters in the Trace tool dialog box that is accessed by double-clicking on the tool. In addition to colour mode, resolution and path conversion mode you can select which layers to trace and set tolerances for trace conformity, noise tolerance and wand tolerance. It would be better if this

Envelope distortions make easy work of warped text effects – this one isn't included in the presets though

On the right the bitmap original, on the left autotraced. It's even made a good stab at the graduated tints

The next stage is to export the file in .swf format. You can export pages, layers, or both to create animations. The export dialog allows you to set path and image compression, frame rate and Flash version compatibility. You can also set the animation to autoplay in full-screen mode and protect against someone downloading and editing it.

Of course you don't have to use the release to layers Xtra, you can create your own layer-based animation and use the export filter in the same way. But it does provide a quick and simple route and, used in combination with the perspective grid and symbol library, can help produce sophisticated animated effects in no time.

As well as groups, text and blends can be animated using release to layers. Blends attached to paths can make for particularly interesting animations.

Using Freehand's symbol library not only saves time, but file space, as multiple uses of the same symbol are stored as references to the first symbol rather than repeat descriptions. Symbols are exported intact to Flash, so an animation with several occurrences of the same symbol will download more quickly. The editing process is also speeded up, because editing a symbol updates every instance in a document.

Despite the popularity of Flash – 185 million people, or 88 per cent of web users can view Flash, according to IDC – Macromedia recognises, like Adobe, that many web designers like to work with bitmaps. Accordingly it has provided a Photoshop export filter that maintains

were a modeless palette. As it is, having set the parameters, you have to close the box before carrying out the trace. Inevitably you'll need to undo, reopen the dialog box and make adjustments to get the best results. Overall though, Freehand's new autotrace did a good job on a variety of subjects – much more quickly and accurately than its predecessor.

Perhaps one of the most compelling reasons for upgrading to Freehand 9 is the extended support for Flash. Freehand can export static and animated Flash .swf files either for direct web use or for further editing in Flash 4.

You create Flash animations using the Animate/release to layers Xtra. First you create all the elements of your animation and group them on one layer, before applying the Xtra. The dialog box provides four animation types: Trail, Drop, Build and Sequence. Release to layers creates a new layer for each frame of the animation and moves the relevant objects to the appropriate layer.

You need to make sure the individual elements are correctly ordered – the final animated sequence is dependent on the layer order that itself depends on the stacking order of the grouped elements.

A Flash sequence, for example, displays each layer in sequence, starting at the bottom. The release to layers Xtra creates the bottom layer from the object at the rear of the group, the top layer from the object at the front and all the intermediate layers.

Freehand's layers intact (you can also export to Illustrator with layers intact). Other export options include Dreamweaver-friendly HTML, GIF, JPEG and PNG. There's also a PDF export filter, although we failed to get this to work in the beta version.

A myriad of other additions and enhancements geared towards ease of use have been included. A lasso tool makes for easier drag selection of objects – you just free-form draw around everything you want to include. There are two modes: one where only objects entirely within the selection are included, and 'contact sensitive', where partially included objects are also selected.

Better page management, a Flash preview mode, step and repeat, improved linked-file management, new units of measure and blending improvements will all make life easier for experienced Freehand users. But the tweak that will get the biggest cheer is the automatic mode change of the I-beam text cursor that now changes to the pointer when outside an active text box. Never again will you inadvertently create unwanted text boxes when clicking outside a text object to deselect it!

Choosing between Freehand and Illustrator, or indeed CorelDraw, is no longer the straight choice it used to be. Illustrator 8 has the edge for those who are interested in pure illustration, but for the wider view – a flexible and versatile graphics production tool – Freehand 9 will take some beating.

KEN MCMAHON

DETAILS
★★★★

PRICE Freehand 9 £327.83 (£279 ex VAT); **Freehand Flash Studio** £468.83 (£399 ex VAT); **Upgrade from Freehand or Flash to Studio** £163.33 (£139 ex VAT); **Upgrade to Freehand 9** £116.33 (£99 ex VAT)
CONTACT Computers Unlimited 020 8358 5857
www.macromedia.com
SYSTEM REQUIREMENTS 120MHz processor, Windows 98/NT4 (SP3) or above, 32MB RAM, 50MB free hard drive space, CD-ROM drive, 800 x 600 colour monitor, PostScript printer (recommended)
PROS Excellent Flash tools & support, perspective grids, improved tracing
CONS No perspective or enveloping for bitmaps
OVERALL Must-have upgrade, both for existing Freehand users and Flash-friendly web developers

Macromedia Director 8 Shockwave Studio

If you're creating animated Internet content this authoring tool will serve you well.

Shockwave is one of the Internet's catchwords, and it's no wonder with the Shockwave player now being bundled as part of all AOL, Windows, Netscape, Internet Explorer and MacOS installations. In short, almost every computer capable of browsing the Internet can download, understand and play Shockwave content.

Now up to version 8, Director is still going strong, being one of the key authoring tools for animated Internet content, but, in the home market at least, it has been overtaken by another Macromedia product, Flash, which is easier to use, largely because it is far less complex.

In version 8 there are a number of new features aimed at making Director movies quicker to construct. The most obvious change is the new property inspector. Much like the property inspector in Fireworks, this puts all your variables in one place, so if you need to make changes, you can quickly locate and identify the fields that need tweaking. This replaces many of the toolbars and palettes but, like Dreamweaver, Director still benefits from a large screen and you'll soon find a 17in monitor starting to feel somewhat cramped. We used a 21in monitor in our tests, which was great, but 19in would probably do fine for all but the most extensive use.

Selecting anything on the 'stage' (as the workspace is known) will display brief details of what it is in a transparent box beneath, giving you immediate confirmation of what you have clicked in a crowded working area.

Director supports https, CGI form post and XML parsing, and uses MP3 compression for audio. A new feature is internal, selectable JPEG compression. You can set an overall level of compression for all the elements in your movie as a whole, and then supplement this by defining specific compression
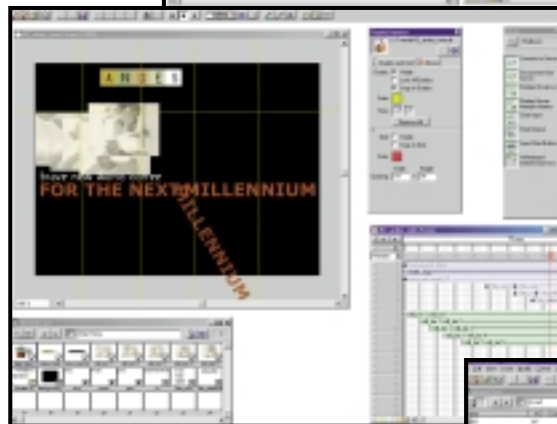
Top: Like Dreamweaver, Director has no problem filling a large screen
Above: The stage (upper left) showing the new grid lines feature and pasteboard onto which unseen parts of the animation have spilled
Right: Director presentations make an interesting alternative to a series of static screen slides

settings for particular elements. You might, for example, want to apply a uniform level of 50 per cent compression to all elements, but then set your corporate logo to be displayed without compression and thus maintain a clean image. Fireworks 3 is bundled, so it's not surprising that the bitmap tab of the property inspector includes a button to open Fireworks' image optimisation palette to handle images on an individual basis. The benefit of this is that it allows you to see the effect of the changes you

are making, and compare these with the original image, all without the need to save them to disk first.

Macromedia has looked at the way users work and added grid lines to the workspace, which is somewhat reminiscent of desktop publishing. This lets you align elements precisely on your page, and the point from which they are aligned will determine where they snap to the grid. Pick up an element in the upper-left quarter, for example, and it is the top-left corner that will snap to a grid line or intersection.

You can now zoom on a scale ranging from 12 to 800 per cent for pixel-accurate element placement, and then pan your workspace by dragging it with the mouse. The main benefit of this is that by zooming out you can expose the blank pasteboard area around the edges

of the stage. Any elements that start off-stage, get moved across and finish off the opposite side of the stage, can therefore be easily manipulated even when not within the workspace by making use of the surrounding pasteboard.

The Internal Cast palette shows not only thumbnails of the images you are using in your production, but also representations of sounds and text. This is effectively the filing cabinet that holds everything in use at any time, and if

thumbnails are not your thing, you can reorganise it as a list. The attributes displayed as part of the list are user-defined and you can even add your own comments to each character either as a group or on an individual basis.

Seasoned Director developers will be well versed in Lingo, the suite's programming language. This is used to write 'behaviours', the actions that elements within your production undertake. If you are coming to Director anew, though, you'll welcome the addition of plain English programming, making it possible to use phrases along the lines of 'go to the menu' and still end up with a working presentation. Keywords and attributes are colour-coded, even when you are using plain English, making it easy to navigate the various parts of your script. To save time, Director ships with over 100 pre-defined behaviours, so if programming is not your forté there's a good chance you'll be able to find everything you need already written.

Director 8 includes a 1,000-user server application that lets you build community applications to run within your pages. In Director 7, this much-ignored addition ran to only 500 concurrent users. A good

example of the use to which this might be put is in building a chat room, and Macromedia has included all the behaviours necessary to make this work without resorting to programming. Once the various sections of your chat room have been drawn on the screen (text input field, name field, chat view and so forth) you simply drag the corresponding actions out of the library and drop them onto the various parts of your design. For example, the behaviour that connects the user to the server can be dragged onto the sprite you have designed to represent that action. All that is left for you to do is to fill in the fields that will let the browser locate the server and you're done. The user need then only click that button to connect, unaware of the coding that goes on behind the scenes to complete their connection.

The whole Director 8 Shockwave Studio package is Director, Fireworks 3, the Shockwave player, Soundforge XP and the Shockwave Multiuser Server 2 with a 1,000-user licence. Unfortunately, however, this new version of Director is not backwards compatible – you cannot create Shockwave output for earlier versions of the player, so your users will

have to upgrade to the latest version to see your new content.

NIK RAWLINSON

DETAILS
★★★★

PRICE £799 (£680 ex VAT), upgrade from version 7 for £279 (£237 ex VAT), upgrade Mac and Windows versions together for £499 (£425 ex VAT), upgrade from a version earlier than version 7 for £349 (£297 ex VAT)
CONTACT Computers Unlimited 020 8358 5857
www.macromedia.com
SYSTEM REQUIREMENTS 200MHz processor, Windows 98, NT4 or later, 64MB RAM, 100MB available hard drive space, 256-colour monitor capable of 800 x 600 resolution, CD-ROM drive, Windows-compatible sound card
PROS Widely installed player base, Multi-user Server makes creating communities easier
CONS Not backwards compatible with earlier versions of the player
OVERALL A great way of creating interactive and appealing web pages, but Flash may be more suited to the less demanding and smaller-scale user

Pocket Universe 2000

If you've got your head in the sky and are into stargazing check out this interplanetary craft.

There's a whole universe out there you know, and we're not talking metaphorically either. But whether at home or abroad, it's easy to get lost in the night sky. Well fear not, as John Kennedy has just released version 2.1 of Pocket Universe 2000 – a 269KB star map for most Windows CE handhelds.

Pocket Universe 2000 plots a real-time map, based on your current time and location, and can display stars as faint as seventh magnitude – that's about the limit of the naked eye under good, dark conditions. Once set up, you can easily move around and zoom in and out of portions of the sky as desired.

Display options

The universe in the palm of your hand: Take a trip around the planets with Pocket Universe

include limiting stellar magnitude, a red mode for protecting night vision, constellation outlines, overlay gridlines, and labelling of all 110 Messier objects and local residents of our solar system. Speaking of which, there are single button clicks which take you straight to the current position of Mercury, Venus, Mars, Jupiter and Saturn, along with the Sun and Moon. Colour is well used, particularly at sunset and when zoomed in on the moon to reveal its current phase. An optional upgrade even shows tiny photographic images of nebulae and galaxies.

Other neat features include a real-time or speeded-up view of Jupiter's four Galilean moons, an Orrery

mode where the relative orbital positions of our solar system's planets are plotted from 'above', and Ephemeris, which calculates the rising and setting times of the Sun, Moon and planets.

Pocket Universe is designed as an observing companion for naked-eye and binocular users, and will guide you round the sights of the sky. At £20 it's a perfect utility for CE users with heavenly desires.

GORDON LAING

DETAILS
★★★★

PRICE £20 (£17.02 ex VAT)
CONTACT Sticky Software
www.sticky.co.uk
Purchase online at:
www.cechopper.com
PROS Cheap, handy electronic star map
CONS Advanced astronomers will find it basic
OVERALL Perfect companion for naked-eye or binocular observers

MetaCreations Carrara

The Kate Moss of the 3D software world – fun to use with professional results.

To see it is to love it. Carrara is a beauty. In a software world filled with practical but far from sexy offerings, here is a gorgeous, pouting Kate Moss. But is this vision of loveliness more than just a pretty interface?

Carrara combines and replaces MetaCreations' two 3D-authoring packages Infini-D and Ray Dream. At £299 (ex VAT), it is much cheaper than the big, £1,000-plus professional behemoths, such as 3D Studio MAX and Lightwave, and undercuts even Caligari's formidable Truespace and Macro-media's Extreme3D, which cost around £400 (ex VAT).

Given the price, the feature set is impressive. Most of the tools you would now expect to find are there: 'Metaballs' (malleable modelling entities), multi-layered textures, scripting and compositing. There are some omissions, notably network rendering and NURBS (used to create complex curved surfaces). This is not necessarily a problem, as the effectiveness of a 3D package rests on results, not just specifications, and access to too many fancy effects can muddle the modelling and rendering process.

Which brings us back to that interface. It is simple and easy to navigate. If you have used any other MetaCreations products (such as Bryce and Canoma) you will immediately recognise it, as the same basic layout has
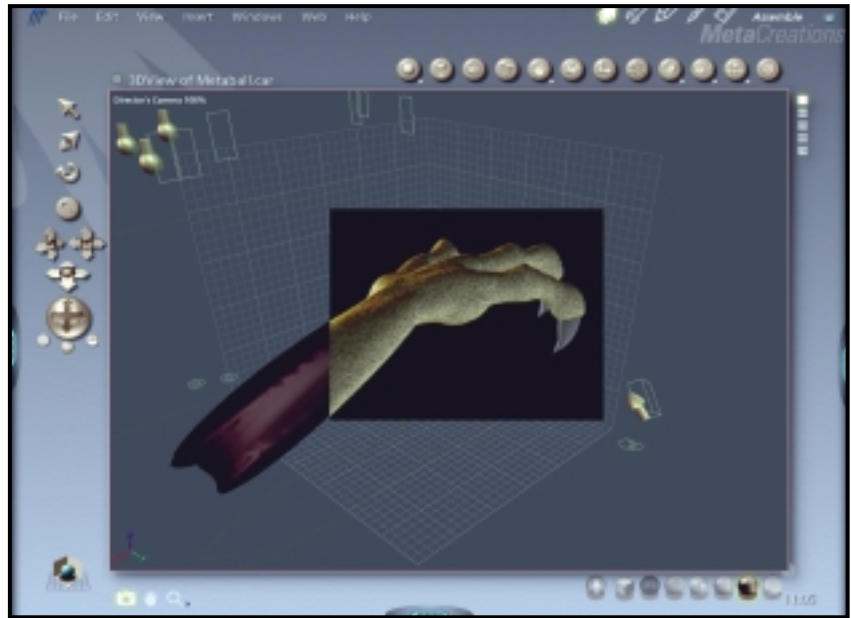
The main Carrara interface, showing the assembly room. A sample render of a section of the model has been done

been used. Some PC users may be irritated by its violation of Windows conventions, but they should quickly come to terms with its quirks.

When the program first starts, you are presented with a window showing the 'workspace' for the scene/model being worked on. As with most 3D packages, you can view the workspace from different angles through several 'viewports'. To the left of the workspace is a set of tools for moving, rotating and scaling selected objects within the scene, and for altering the view of the scene. Above is a series of

buttons for adding primitives, such as spheres, and special objects, such as Metaball 'blobs', terrains, particle emitters, lights and cameras. Below is another series of buttons for changing the way the scene is viewed, including different ways of rendering the objects in the viewport (as wireframes, rendered objects or partially textured objects). The Windows version of Carrara supports both OpenGL and Direct3D, so it should

The interface is split up into a series of 'rooms' where you perform different jobs

be able to take advantage of 3D-hardware acceleration – more or less essential to smooth operation.
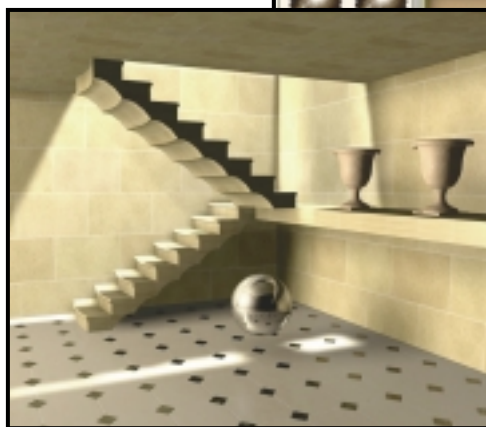
Surrounding the window are three handles that can be used to drag out the Sequencer, Properties and Browser 'trays'. The Sequencer lists the objects in the scene beside a chart that shows what happens to the objects over time. It is the main tool for managing animations, although it can also be used to select particular objects by name. The properties tray shows the properties for particular objects, materials (called

'shaders') or the entire scene. The browser tray allows you to load in a folder of preset objects, cameras, lights, shaders, bitmaps, 'effects' (for example, lens flare) even 'constraints' (that determine how an object can be animated) and drag them into the scene from the browser tray, or the primitive buttons.

The interface is also split up into a series of 'rooms'. You perform different jobs in different rooms. The default is the 'assemble' room that is used to bring together objects and materials, usually dragged into the workspace using the browser or the buttons for primitives and special objects. The other rooms are for modelling (and behave differently, depending on the type of object you are modelling), applying shaders or textures, animating and rendering.

Most of these rooms are well designed and easy to use. The animation room is particularly useful, as it displays a 'storyboard' for the scene, a series of frames that show what is going on at any particular time. You can add and manipulate objects within each frame, and see the results of the changes over the length of the animation. The texturing room is relatively easy to use as well. A panel appears showing a texture hierarchy, with the main material and

each of its 'channels' (the textures properties, such as shininess, bumpiness and so on) at the top. To create multi-layered textures you add branches to the tree. The render room is more or less bare, at least when you first enter it. It fills up with a picture of the fully rendered scene as it is computed. The renderer seems reasonably fast.

In each room, the contents of the trays reflect what's going on. So, in the render room the properties tray contains settings for rendering the scene: the type of renderer to use (z-buffer, ray tracer or 'hybrid ray tracer', an optimised version of the ray tracer), the size of the output image and whether or not shadows and reflections should be rendered.

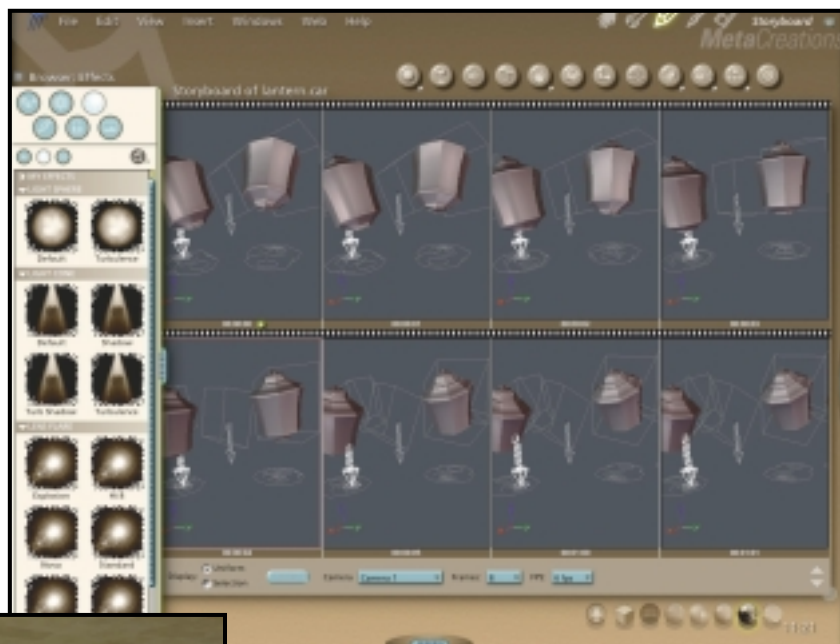Working on a project involves moving from one room to another. Often this happens automatically. For example, if you press on the spline or vertex object button in the assemble room and drag onto the workspace, you are taken straight to the modelling room, where the tools for creating spline objects

The animation or 'storyboard' room, showing frames from an animated model of swinging lanterns. The panel on the left is the browser tray

'Light Study', an example of what can be achieved

become available. Spline objects are built up from splines, or curved lines, that act as cross-sections or profiles for the finished model. Vertex objects are built up by moving individual vertices.

The rooms reveal one of Carrara's weaknesses. Early 3D packages were really suites of separate programs for modelling, texturing and so on. Having to swap between these programs while working on the same projects was awkward, so in more recent years 3D-software development has focused on becoming 'modeless', using the same workspace to perform these different functions. Carrara takes a step backwards in this respect, although artfully dresses up the manoeuvre with the 'rooms' device. And it nearly pulls it off. However, in certain crucial areas the trick fails, such as in the Metaballs modeller, in which various tools behave differently to the rest of the package. For example, the zooming tool works in an entirely different way; a trivial inconsistency, one might think, but very

annoying when you are moving frequently between rooms.

Another shortcoming is the quality of its documentation and help. There is no context-sensitive help; all you get is an online version of the manual in PDF format. This is useful, but no substitute for a proper help system in such a complex piece of software, and the situation is made worse by the quality of the manual itself, which often provides no more than cursory coverage of the subject matter.

The Tutorial is worse. The printed version is full of mistakes, calling for non-existent menu options and introducing concepts without explaining them.

There are a few other problems. For example, there is no method for 'locking' a selection, to prevent accidental interference with unselected objects. There is a crude system for creating selection sets (grouping objects so that they can all be selected at once), but it is only implemented in the Metaballs modeller.

MetaCreations has recently announced a change in corporate strategy, focusing on website content creation. How Carrara fits in with this is still unclear. The package outputs to

MetaCreations' Metastream format, for sending streaming 3D over the Internet, so perhaps this assures it a place in the company's future. Being a brand new product, one would expect a certain level of long-term commitment.

Carrara certainly deserves it. Its elegance and functionality makes it a sparkling entry to the 3D-software market. It also appears to be exceptionally well behaved. In all the time we used it, it did not crash once. Beautiful and reliable – now that's quite a combination.

BENJAMIN WOOLLEY

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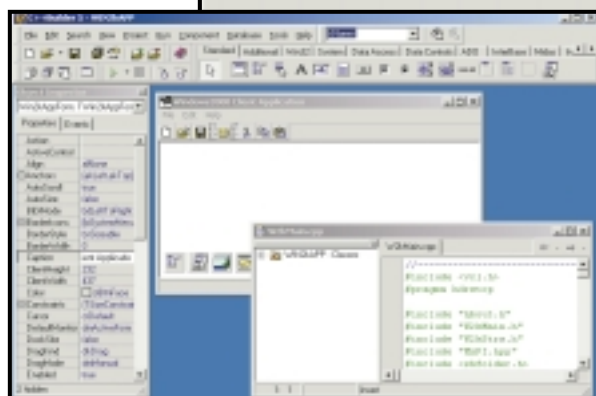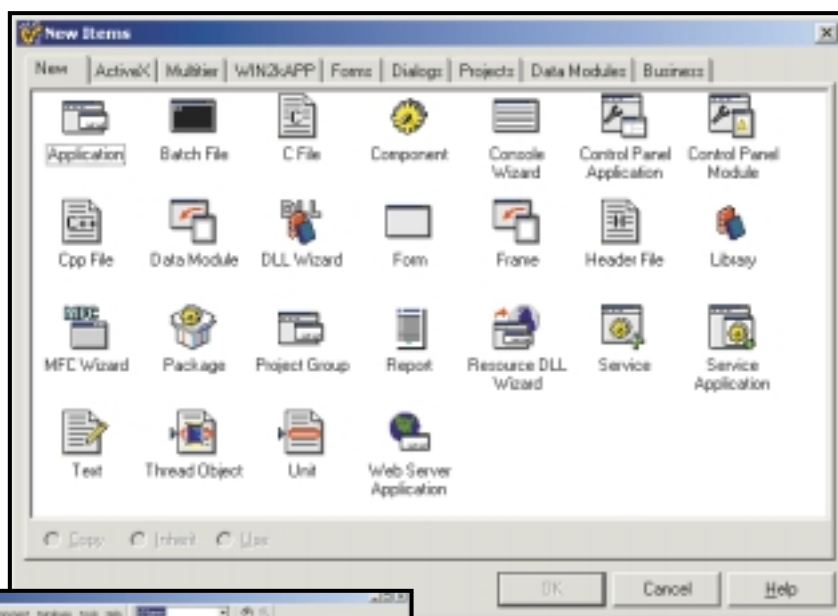
Borland C++ Builder 5.0

A host of new features make this the visual development tool to beat.

These are interesting times for Borland watchers. First the company announces that Interbase, its server database engine, is to be open source and freely deployable. Next it announces that the company is focused on Linux, a far cry both from the Windows development tools that generate most of its income, and the high-end application server product with which Inprise was going to tap into the Enterprise market. Then it is taken over by Corel, an unlikely home for products like Visibroker, Borland's high-end Corba-compliant object request broker. Finally it gives away a couple of top-notch developer tools, JBuilder Foundation and the C++ Compiler 5.5. These are not out-of-date products. The same compiler used in C++ Builder 5 is available free at www.borland.com.

The reason for these quick-fire changes of direction, is that Borland has come to regard the Windows market as a dead end, because Microsoft is able to be a single supplier for everything from tools to applications. The irony is that Windows remains Borland's biggest market. In addition, giving away Borland C++ merely proves that in the days of GNU C++ the commercial value of a naked C++ compiler is small. What counts is the class library and visual development tools, which brings us to C++ Builder.

C++ Builder combines the Pascal Visual Component Library and visual IDE as found in Delphi with the afore-mentioned C++ compiler. The release cycle is such that Delphi gets major enhancements first, with C++ Builder following and adding a few extras of its own. That means most of the new stuff in C++ Builder 5 can already be found in Delphi 5, although this counts for little if you are a C++ developer. The Pascal is more or less invisible, unless you need to delve into the library source code.

There is a host of new features in C++

The list of wizards in C++ Builder gets ever longer, including an MFC project and the new Control Panel applet

The new C++ Builder Windows 2000 client application is disappointingly free of Windows 2000 features

Builder. Top of the list is support for ADO, Microsoft's current data-access standard. ADO is important as it is used as the data access API for ASP (Active Server Pages), Microsoft's popular extension to Internet Information Server. Another advantage is that some native ADO drivers, such as that for Microsoft Access, have more features and perform better than ODBC or DAO equivalents. ADO does not require the Borland Database Engine, and nor does Interbase Express, a set of components that give direct access to the Interbase API.

Web developers get a new set of MIDAS (multi-tier database development services) that use XML data packets and can easily support browser clients. The snag with MIDAS is that it requires expensive runtime licences. There is also a
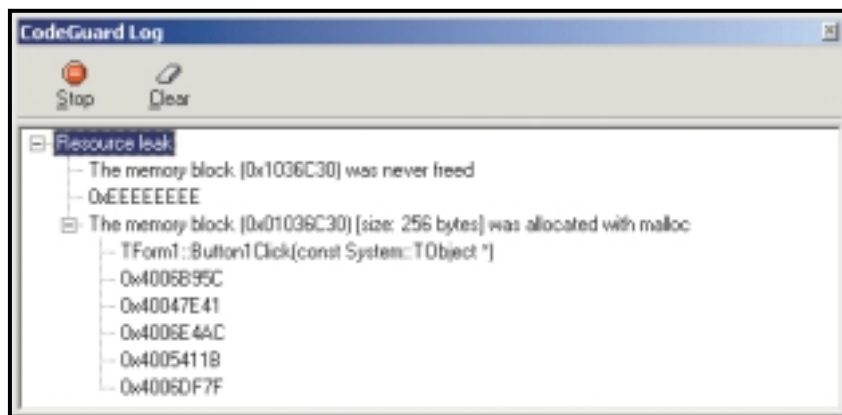
new control for embedding Internet Explorer into an application, enhancements to the ISAPI/NSAPI web server application components, and a useful wizard that builds skeleton objects for ASP applications.

New tools for COM+, the Windows 2000 name for Microsoft Transaction Server, also make an appearance. The advantage of COM+ is that it provides intelligent management for components running on a server, including transaction support, so that resource usage is reduced and applications scale more effectively. It is also effective in ASP applications. The transactional object wizard creates objects that can be used with either COM+ or MTS. Since the migration to Windows 2000 on the server will be slow and careful, this is a vital feature. In addition, a handy IsComPlusPlatform variable lets you detect whether a component is running under MTS or COM+.

The C++ Builder IDE now saves project options as XML, which means you can easily edit them as text. The real advantage is the potential for third-party access to the file. The layout of the IDE can be saved, so you can have several different layouts that you load as

Codeguard catches runtime errors such as memory leaks

required. New to-do lists help keep track of outstanding tasks, a practical and useful feature. Compilation is slower in C++ Builder than in Delphi, but a new background compilation makes this less of an issue than it was, and the incremental compiler is smart.

For debugging, Codeguard makes a welcome return. This utility checks for memory errors, such as uninitialised pointers at runtime. It was first shipped with Borland C++, but until now was not available in C++ Builder. Codeguard is not as sophisticated as specialist tools from Rational and Compuware Numega, but as a bundled and well-integrated extra it is invaluable.

Unlike Delphi 5, C++ Builder 5 has emerged after the release build of Windows 2000. To prove it, there is a wizard for a Windows 2000 client application. This is stunningly similar to the old Windows 95 logo application wizard, with some small differences, such as a new default to saving files to My Documents, which the Window 95

Windows 2000, the only option is to obtain the MSDN library CD from Microsoft. This kind of niggle persuades developers looking for a single development suite to choose Visual Studio rather than a Borland product. On the other hand, Borland has worked hard to keep pace with COM, which is the most significant aspect of enhancements to Windows itself.

Enterprise users get a range of goodies including a brand new source management system called TeamSource. This uses a parallel model of source control, which means that checked-out files are not locked. More than one developer can work on the same file simultaneously, and at check-in time differences are reconciled. TeamSource requires a separate physical version controller, which can be Merant's PVCS or the supplied ZLib, a simple zip-like archiver. Sadly there is no support for the popular Visual SourceSafe. The Corba features are updated to work with Visibroker 3.32. There is also a highly

compromise what you can do, since there is nothing to stop you creating your own VCL extension components, or coding directly to the Windows API, or ever using MFC if you have to.

C++ Builder has a compiler option specifically for MFC compatibility. C++ developers who dislike Pascal may find themselves having to browse Pascal source from time to time, but in practise this has not proved much of a problem. Finally, the Borland C++ compiler is one of the best when it comes to standards compliance, whereas Microsoft is primarily focused on Windows development. If you want to work with the Standard Template Library, C++ Builder is a better choice than Visual C++.

There are three versions of C++ Builder. The Standard edition has no database features or web components. For most users, these limitations are too great to make it usable. Professional has old-style database support through the BDE (Borland Database Engine), and multi-tier COM support, but no SQL Links drivers for client-server data access, and no ADO components either, although these are available as add-ons. Buy the Enterprise and you get all those plus the XML-based MIDAS tools, multi-tier Corba support, TeamSource and the Translation Suite. The snag with the Enterprise edition is not only the price, but that you need runtime licences to use many of its features. Whatever the respective merits of COM and Corba, COM is a substantially cheaper solution.

TIM ANDERSON

C++ Builder has a lot to commend it, even when up against arch-rival Visual C++

version should have done anyway. There is a serious point here, which is that C++ Builder does not have a wizard for building applications suitable for Windows 2000 certification, no doubt because the requirements are too stringent. Borland is also shipping a disgracefully old Windows programmers' reference. The reason seems to be that the company is sticking to the old winhelp online format, whereas Microsoft's newer documentation is in HTML help. If you want documentation for a function like EncryptFile, new in

impressive set of translation tools, the Integrated Translation Suite, which does a lot to smooth your path if you want to use international resources in an application.

Despite a few hassles, C++ Builder has a lot to commend it, even when up against its arch-rival Visual C++. The Visual Class Library is a higher-level wrapper than Microsoft's Foundation Classes (MFC), which means programming is quicker and safer. Its other big plus over MFC is the support for drag-and-drop visual development. The beauty of the VCL is that it does not

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PROS Feature-rich, productive and standards-compliant

CONS No ADO components in the Professional edition. Ancient Windows SDK documentation

OVERALL With its advanced visual class library, fast background compiler, and abundant wizards and tools, this is the C++ development tool to beat