

reviews

So what do school dinners and a reviews section have in common? They come in small portions and there's chips with everything... *fnar, fnar!*

No, really, it's true. It's small portions all around in the form of Sony's half-depth **PCG C1 VAIO**, a couple of new **PALM** computers from 3Com, Macromedia's **FIREWORKS 2**, perfect for shrinking your graphics before putting them on the net, Hewlett-Packard's CapShare **HANDHELD SCANNER**, the latest Nokia 9110 **MOBILE/PDA** combo and Canon's **TITCHY BJC-2000** printer. And the chips? No less than six: a UK **EXCLUSIVE REVIEW** of AMD's **K6-III**, Intel's brand new 433MHz **CELERON**, the Rage 128 2D/3D chipset on ATI's latest batch of high-powered graphics cards, the 3Dfx Voodoo III, PCs from Armari and Dan sporting 500MHz **PENTIUM III** processors, and the



Sony PCG C1's big brother, with our second look at the Pentium II 366MHz mobile chip. It's been a busy month in IT, and we've distilled the highlights into these review pages.

We also look at the pros and cons of **WIRELESS** networking and pit this against more conventional means of connection.

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VNU European Labs



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

Ratings

- ★★★★★ Highly recommended
- ★★★★ Great buy
- ★★★ Good buy
- ★★ Shop around
- ★ Not recommended

Sony Vaio PCG-C1

Handheld Windows 98 portable

Exclusive preview of this **amazing, tiny portable** due for release in April.

If you thought Sony's Vaio 505 ultra-thin notebook was the bees knees, you'd be in good company. Unfortunately the international knee standard for bees will once again have to be updated for the Sony Vaio PCG-C1 is quite easily the sexiest portable I've ever had the pleasure of using.

I happened upon the PCG-C1 during a recent trip to Hong Kong. And, just as we were going to press, we exclusively discovered that Sony UK intends to launch the C1 in the middle of April. Thrilled, we persuaded Sony to fly us over a Japanese model to preview.

The C1 is certainly small, but Sony has once again opted for a full Windows 98 solution. It believes that end users prefer the power and compatibility of such a device over, say, Windows CE which the company currently has no plans to implement. Don't be fooled by the C1's size though, since it boasts a 266MHz MMX Pentium processor, 64Mb SDRAM, 4.3Gb disk, an 8.9in widescreen XGA display and colour video camera, yet weighs a mere 1.1Kg.

The first thing to strike you about the C1 is its small footprint of 240 x 140 x 37mm and its rather fetching magnesium alloy outer shell. Opening the shell reveals the quite usable 17mm pitch/2mm stroke 87-key keyboard which occupies almost the entire lower surface and a pointing nipple device sits in the centre. The upper half is dominated by the impressive display. Sure, we've seen wide aspect colour displays on portables but the C1's TFT panel boasts an amazing 1024 x 480 pixels running in 24-bit colour across an 8.9in diagonal. Powered up, it looks fantastic with tiny but clear icons and details. It will also drive an external monitor in 24-bit at 1024 x 768.

Moments later, you cannot help but notice the tiny camera fitted just above the display. This 1/6in 270,000 pixel

CCD can capture still or moving images, along with synchronised sound, and the lens can be rotated 180° to capture images behind it. Sony suggests sending images or clips with emails, but with the correct software and connection there's no reason why you couldn't videoconference with the C1. The camera and supplied software also supports Sony's new CyberCode format, which can launch software by passing specific 2D bar codes before it.

From the connectivity point of view, the C1 is a dream. Ports down one side include infra-red, headphone, microphone, USB and IEEE-1394 — known by Apple as FireWire and Sony as i.LINK. On the opposite side you'll find a Type-II CardBus/ZV PC Card slot. The C1 is supplied with a USB floppy drive (sadly not a HiFD unit) but a CD-ROM drive will cost you extra.

The unit supplied for this preview was running Japanese Windows 98 which, along with the wide aspect display, slightly confused our benchmark. Our imported model was also fitted with a slightly slower 233MHz processor under which SYSMark returned an approximate figure of 69, comparable to other 233MHz MMX notebooks we've tested. Battery life tended to be between one and three hours.

The C1 is highly desirable but potential purchasers should think carefully about their portable requirements. The C1's display and keyboard are great but if you're only going to be using it for basic office applications on the move, you may be able to make do with something simpler, cheaper and with a far longer battery life, like a CE-based HP Jornada.



You should also know that there are more Windows 98 micro-notebooks out there than you may think, online dealers such as Japan Palmtop Direct <www.jpdc.com> will have you trembling in anticipation! However, I suspect that most people will, like me, fall in love with the C1 on sight and bask in the sheer envy of lesser portables — brand loyalty has never felt so good.

GORDON LAING

PCW DETAILS



★★★★★

Price £1,399 (£1,190.64 ex VAT)

Contact Sony 0870 240 2408

www.vaio.sony-europe.com

Good Points Tiny, gorgeous, feature-packed.

Bad Points No CD-ROM drive as standard.

Conclusion Neither desktop replacement nor pocket-sized, but still the most desirable portable we've seen.

PERFORMANCE RESULTS

0	25	50	125	150
SYSMark 98				69

Note: Results on 233MHz Japanese model. UK version will be 266MHz.

The knee standard for bees will have to be updated ...

EXCLUSIVE

AMD K6-III 450MHz Socket 7 PIII challenger

An exclusive review of this **cheeky 450MHz chip**, tested against the 500MHz PIII.

The release of Intel's Pentium III has not gone unnoticed, thanks largely to its blanket marketing campaign. AMD's more reserved approach to the K6-III has relied more on reputable reviews by those privileged enough to receive samples. AMD claims that in terms of raw data processing, even the slowest of its new K6-III chips, the 400MHz, will outperform a Pentium III running 100MHz faster. We got our hands on a 450MHz K6-III for an exclusive UK review of this new chip.

Loyal followers of the Socket 7 platform argue that it is a proven infrastructure delivering performance and features matching Slot 1. However, things have moved on dramatically since this argument first presented itself at the launch of K6-2 and the much-heralded 3DNow! instruction set.

For starters, Intel's belated response to 3DNow! was the launch of the Katmai New Instruction set with major plug-ins or patches released on the same day as the PIII. That said, AMD had almost a nine-month head start, giving software developers a chance to develop the code to take advantage of the performance-improving calls.

The K6-2's Achilles heel was that its restricted Level-2 cache was forced to run at the speed of the front side bus while the processor's clock speed was being increased. By employing a new 0.25micron manufacturing process this has now been addressed and AMD is able to squeeze a full 256Kb of on-board cache directly onto the processor die. The net result is that the cache now runs at a backside bus speed identical to that of the core. It may be only half its original size but it still delivers a dramatic performance boost.

By moving the cache in this way, motherboard cache comes back into play. Because the ceramic pin grid array (CPGA) package of the K6-2 contained a Level-2 cache off-die, any other Level-2 cache would be ignored. This dampened



the spirits of many an enthusiast when 2Mb Level-2 cache motherboards started to appear.

AMD's new TriLevel Cache design re-enables motherboard cache usage up to a current maximum of 2Mb, offering potential performance increases of up to eight percent over a K6-III system with none. This combined cacheing capacity is currently up to two and a half times larger than typical competing designs.

So how does this translate into actual performance? It's important to note here that with such new chips, the benchmark used for performance testing has no optimisation for instruction sets. This is true for both the K6-III and the Pentium III. A fully optimised system, including its graphics drivers and applications, would in fact perform marginally better. As it stands, our benchmark will compare the physical architectural aspects of each processor, encompassing every factor of a blind, unoptimised system.

The test platform consisted of 128Mb PC100 SDRAM, an 18Gb EIDE Western Digital hard disk (model AC418000, 7200RPM, av. read seek 9.0ms) and a 16Mb Voodoo3 3000 AGP graphics card. The K6-III 450MHz was tested on an ASUS P5A motherboard with 512Kb on-board cache running at 100MHz while comparative tests were run with a Pentium III 500MHz on a motherboard

utilising Intel's 440BX chipset. Although the normal core voltage of the K6-III 450MHz will be 2.4v this early sample was running at 2.5v while the Pentium III 500MHz was fully regulated to run at 1.8v.

The results were surprising when you consider that the Pentium III reputedly has a far superior floating-point unit, taking care of much of the geometry processing necessary for graphics rendering. As the graphs below show, AMD's claims have not quite been

proven in our tests but at around two thirds the price of the Pentium III a similarly-clocked K6-III will still provide impressive performance. In a fully optimised system this chip could give Intel a serious run for its money.

IAN ROBSON

PCW DETAILS



Price £347.39 (£295.65 ex VAT) per 1,000 units

Contact AMD UK 01276 803100 www.amd.com

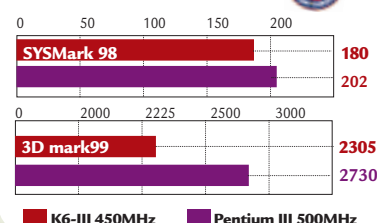
Good Points Motherboard cache support. Allows for low-profile systems designs.

Bad Points Application support for instruction set required to bring out full potential.

Conclusion Performance may not be as striking as has been claimed, but for the price you won't be quibbling over the few points gained in performance by the Pentium III.



PERFORMANCE RESULTS



Voodoo3 3000

Catch it if you can — the **fastest 3D** graphics card in the universe.

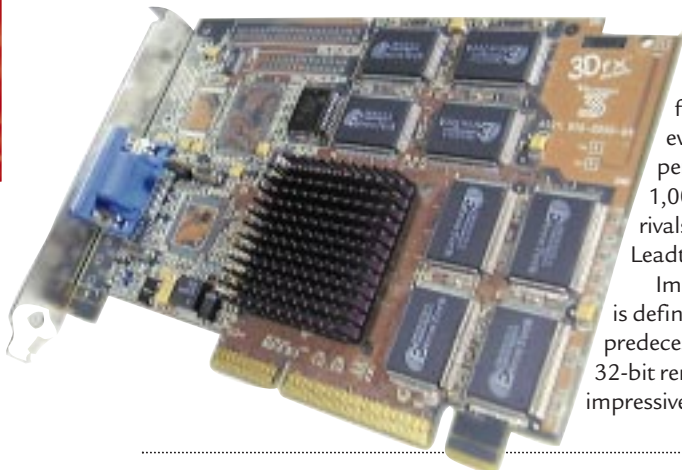
The mother of all graphics cards has arrived, although not with a bang, like its predecessor. Never mind. The Voodoo3 3000 has 16Mb of RAM on board. Driver installation is hassle-free. As the feature-set in our test was incomplete, many of the regular customisation options were missing.

Despite the aura surrounding the Voodoo brand, a lot of advanced features like stencil buffer and 32-bit

Z-buffer are missing. Unlike rival Savage 3D and Rage 128 chipsets, the Voodoo3 does not support motion compensation for DVD playback. At present, neither can it handle 32Mb textures nor OpenGL. The lack of these features might make it less attractive to the OEM market.

The Voodoo name has always been associated with high performance and the Voodoo3 turned in a stunning 3DMark 99 score of 2848 and it is certainly the fastest graphics card we have ever tested. In fact, its performance is almost a full 1,000 points ahead of its closest rivals, the ATI Rage Fury and Leadtek WinFast S320.

Image quality of the Voodoo3 is definitely better than that of its predecessor. However, the lack of 32-bit rendering makes the images less impressive than competing chipsets



such as the Rage 128, G200 and Savage 3D. But if unbridled speed is all you care about, and you're after what is maybe the ultimate gamer's card, the Voodoo3 is definitely the way to go.

AJITH RAM

PCW DETAILS

★★★★★

Price £175 (£149 ex VAT)

Contact 3Dfx Interactive 0171 544 6812
www.3dfx.com

Good Points Fastest 3D graphics card in the world. Good 2D performance.

Bad Points No 32-bit rendering, stencil buffer or AGP texturing.

Conclusion The first choice for the gamer for whom brute speed is everything.

PERFORMANCE RESULTS

0	2000	2250	2500	3000
SYSMark 98				2848

ATi Rage Fury

Catch this graphics card's **great 3D abilities** while you can.

The nVidia Riva TNT chipset has dominated the 2D/3D combo market, while Voodoo2 still rules the dedicated 3D card arena. But ATi's brand new Rage 128 2D/3D chipset has moved it to the head of the field. The Rage Fury is the highest-specification Rage 128-based card and it's fitted with an amazing 32Mb of SDRAM. Although this may sound excessive, it means the ability to run

colour. Its 2D image quality is high, and maximum 2D resolution is 1920 x 1200 at 76Hz vertical refresh rate. But it's 3D performance which really counts these days, and this is where the Rage Fury puts in a great performance although its success is not unqualified. It gains an extremely high 3DMark score but its

Final Reality mark is slightly lower than STB's TNT-based Velocity 4400. The Fury is fitted with TV outputs in the form of both composite and S-Video connectors, and has integrated DVD hardware decoding which

completely decodes the video stream but leaves audio processing to the CPU. It's a reasonable compromise.

The Rage Fury is an excellent card. In terms of sheer speed, it's got some stiff competition in the shape of the Voodoo3

[above], although with a 3DMark score of 1898 it's still going to be able to run games flawlessly at very high resolutions. For users after higher-quality images and DVD support, this is a premier choice.

DAVID FEARON

PCW DETAILS

★★★★★

Price £149 (£126.80 ex VAT)

Contact ATi 01628 533115
www.atitech.com/uk/uk_index.html

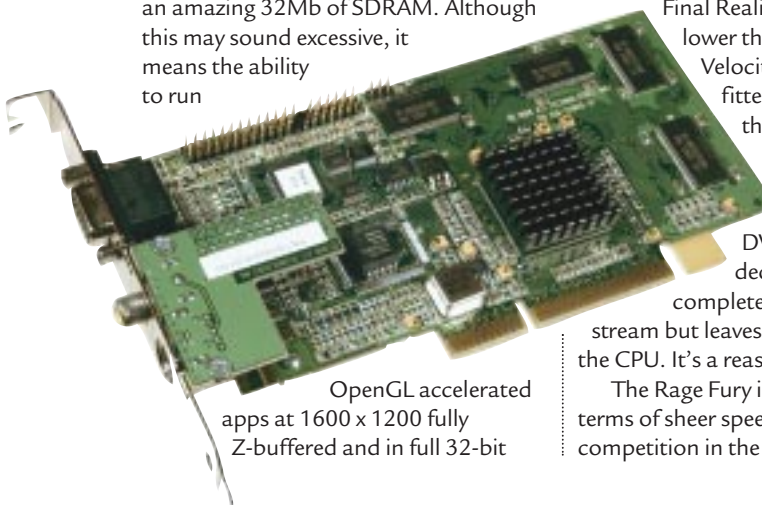
Good Points Excellent 3D performance. Huge frame buffer. DVD decoding.

Bad Points Not massively faster than the competition.

Conclusion One of the best 2D/3D combo cards around.

PERFORMANCE RESULTS

0	500	1000	1500	2000
SYSMark 98				1898



OpenGL accelerated apps at 1600 x 1200 fully Z-buffered and in full 32-bit

Sony Vaio PCG F190

Desktop replacement

EXCLUSIVE

An exclusive look at Sony's new notebook with DV editing.

Sony has only been in the UK PC portables market since last June, yet in less than a year models like the ultra-thin Vaio 505 have helped it achieve a 23 percent share of UK notebook retail sales and become the fifth largest notebook supplier in the UK [Source: Romtek]. Along with flying us a C1 from Japan for exclusive preview (see p77), Sony has additionally offered us an exclusive look at its new top of the range Vaio PCG-F190.

The F190 and the slightly lesser specified F160 are the first two models in Sony's new Vaio F100 series. Both feature 14.1in TFT displays operating at 1,024 x 768 in 24-bit colour and 64Mb RAM (expandable to 192Mb). Mobile Pentium IIs are standard, with the F160 running at 300MHz and the F190 at Intel's currently fastest 366MHz. Storage-wise, the F160 is fitted with a 4.3Gb disk and 24-speed CD-ROM drive, while the F190 boasts a 6.4Gb disk and 2.4 speed DVD-ROM drive. You're looking at £1,619 for the F160 or £2,559 for the F190 (ex VAT).

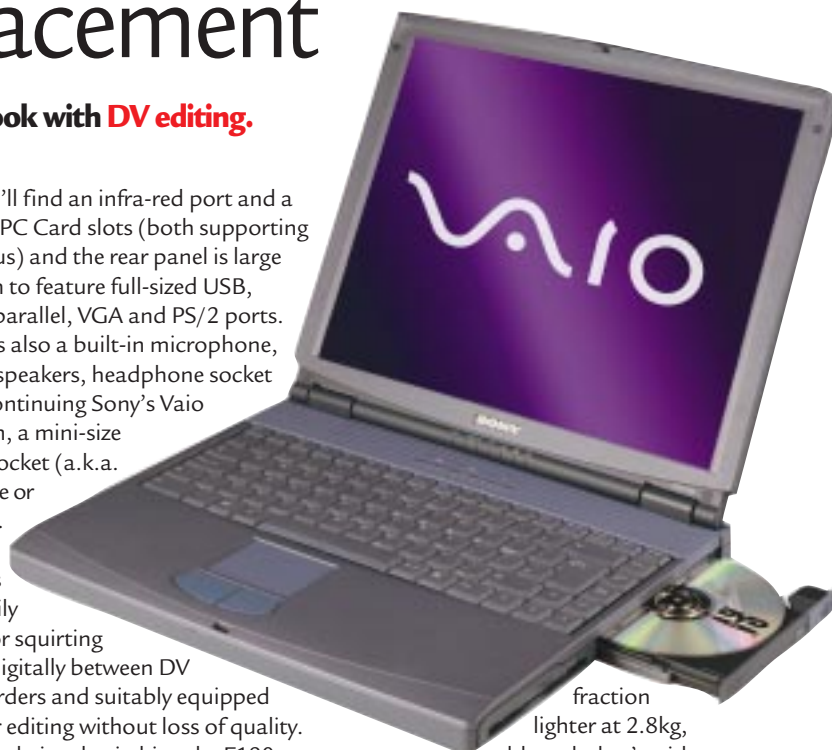
After the recent raft of waif-like ultra-portables, it's interesting to see a deliberately large device designed to pack in the power and capabilities of a desktop PC in a portable package. The F190 measures 324 x 40 x 265mm and weighs 3.1Kg fully loaded with battery, floppy (but not HiFD) and DVD drive.

It looks big sat next to other notebooks and the screen is large enough for a small group to gather around during a presentation. The ample keyboard with its decent wrist-rest is an absolute joy to use. The F190 is certainly no burden to carry around. The DVD drive is a permanent fixture but the floppy drive can be removed to save weight, or replaced by an optional second battery to double the unit's 2.5 hour standard lifespan — excellent software utilities monitor battery performance.

You'll find an infra-red port and a pair of PC Card slots (both supporting CardBus) and the rear panel is large enough to feature full-sized USB, serial, parallel, VGA and PS/2 ports. There is also a built-in microphone, stereo speakers, headphone socket and, continuing Sony's Vaio mission, a mini-size 1394 socket (a.k.a. FireWire or i.Link). Today, 1394 is primarily used for squirting video digitally between DV camcorders and suitably equipped PCs for editing without loss of quality. Sony is obviously pitching the F190 as

such an editor, supplying digital video capture utilities along with a light version of Adobe Premiere. There's MiniDisc editing software, too. A 56K PC Card modem is thrown in, upgradeable to support ethernet, ISDN and Sony GSM mobile phones. An optional port-replicator offers two PS/2 and a 10BaseT ethernet port.

The F190 is a superb Windows 98 notebook but faces some stiff competition. It doesn't have 3D accelerating hardware and employs software DVD playback which, while adequate, is let down by the unforgivable absence of a PAL/NTSC TV output. Last month, we tested Dell's Inspiron 7000 A366 LT with a similar spec but boasting a 15in display, 3D graphics, TV output, Microsoft Works 99 and a slightly lower price tag of £1,999 (ex VAT). The 3D graphics hardware gave Dell an edge in our benchmark test but it's almost 50 percent thicker and a kilo heavier. Dell's 14.1in version is slimmer and lighter than its 15in counterpart but still no match for the F190's vital statistics. Toshiba's top-of-the-range Tecra 8000 is comparable in size to the Sony, boasts a 14Gb disk, can support NT4 and is a



fraction lighter at 2.8kg, although that's without floppy and it costs £3,595 (ex VAT) without Office software or 3D hardware.

Okay, Dell's screen is physically bigger but 14.1in certainly looks large enough. The lack of 3D graphics and composite video output will exclude the Sony for some users, but with its superb build quality and digital video facilities, the F190 is surprisingly competitive and will excel as a desktop replacement or power portable.

GORDON LAING

The power of a desktop PC in a portable package

PCW DETAILS



★★★★★

Price £3,006.83 (£2,559 ex VAT)

Contact Sony 0990 424424

www.vaio.sony-europe.com

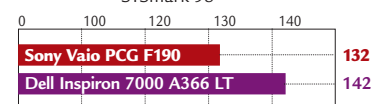
Good Points Well built. Unique DV editing facilities.

Bad Points No Office software, 3D graphics or TV output.

Conclusion Competitive desktop replacement notebook.

PERFORMANCE RESULTS

SYSmark 98



Evesham Micros Scorchers DVD TNT

First of the **433MHz Celerons** comes in at under £1,000.

When Intel launched the first CPU in its budget Celeron range last year, it faced criticism for its poor performance in business applications, due to a lack of L2 cache. Common business applications use the L1 and L2 cache to store frequently accessed data. Intel soon added cache with the introduction of the Celeron 300A processor. Since then, Celeron speeds have increased steadily and the 433MHz version is close to the more expensive Pentiums II and III in terms of clock speed.

The new 433MHz Celeron is available in both Slot 1 and Socket 370 configurations. However, both versions still run on motherboards with a front-side bus speed of 66MHz. This is slower than the 100MHz enjoyed by the Pentium II and III line of CPUs.

This 433MHz Celeron system from Evesham Micro uses the Socket 370 version of the CPU. The new socket looks almost identical to the Socket 7 used by the K6-2 CPUs from AMD. The heat sink and fan are fairly compact, much smaller than their Slot 1 counterparts, and are quite sufficient for cooling the processor.

The Celeron sits on a SuperMicro 370SBA motherboard which sports Intel's new ZX chipset. Unlike the 440BX chipset, the ZX is cheaper and supports a lower front-side bus speed of 66MHz.

The AGP slot is occupied by the powerful 16Mb STB Velocity 4400 graphics card which uses the TNT chipset from nVidia. One of the few chipsets to support 32-bit colour, it has a high RAMDAC of 250Hz. Both OpenGL and DirectX APIs are supported. The Velocity 4400 is an outstanding performer in both 2D and 3D applications. Its score of 1703 in our 3D Mark 99 benchmark is one of the highest for any graphics card.

The Evesham system comes with a SX DVD drive but no hardware MPEG-2



decoder. This means that decoding depends entirely on the abilities of the CPU and the Zoran SoftDVD player bundled with the graphics card.

The sound card is the modest SoundBlaster PCI 64 from Creative Labs and is paired with a set of Zyfi speakers.

Immediately below the DVD sits the hard drive, a massive 10.2Gb DiamondMax from Maxtor. Being a UDMA drive it is fast, spinning at about 7,200rpm. Alongside the sound card is a Diamond Multimedia 56K modem. This leaves two PCI and three ISA slots free for upgrading. There is also one 3.5in and two 5.25in bays free for extra components.

The overall build quality of the Evesham system is excellent. There are two fans including the one for the CPU. The power supply unit with the exhaust fan is located slightly above the motherboard so there is easy access to the components. All the IDE cables are

carefully folded and tucked well away and the ATX case is well ventilated.

The bundled Xeod XJ530 is one of the best 15in monitors around. It supports resolutions up to 1,280 x 1,024 but at this resolution, the refresh rate is only 60Hz. This increases to a flicker-free 75Hz at 1,024 x 768 and 85Hz at 800 x 600. The knob controls on the monitor are easy to use and contrast and brightness settings can be easily set using the helpful on-screen menus.

The Evesham system comes with a comprehensive set of manuals which include helpful tips on troubleshooting and upgrading your PC.

The 433MHz Celeron performs extremely well in comparison to its slower brethren and the faster Pentium II and III processors. The Evesham system scored 165 in our SYSMark 98 tests — only ten percent slower than the fastest Pentium II 450 PC we have seen. Even when compared to the latest Pentium III 450, the new Celeron's performance is impressive. Overall, the 433 processor is an excellent choice for a home or office system.

AGITH RAM

This is an excellent choice for a home or office system

PCW DETAILS



★★★★★

Price £999 (£850.21 ex VAT)

Contact Evesham Micros 01386 769600

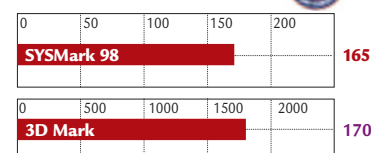
www.evesham.com

Good Points Good performance. High quality monitor. Very high graphics performance. Useful manuals.

Bad Points Motherboard will support neither Pentium II nor Pentium III CPUs.

Conclusion An excellent choice for a home or office system.

PERFORMANCE RESULTS



CorelDraw Professional Publisher

Broaden your layout horizons with this **mature, professional suite** of applications.

Professional Publisher includes just about every graphics and DTP application Corel produces, so the one very large box contains all you're ever likely to need. The software itself occupies no more space than a couple of CDs on which you will find CorelDraw 8, Photo-Paint 8, Ventura 8 and WordPerfect 8. Additional software includes CorelDream 3D 8, Database Publisher, OCR-Trace, CorelScan, CorelCapture 8, CorelScript Editor and numerous writing tools such as a spell-checker and thesaurus.

Draw has always been a feature-rich application so, perhaps not surprisingly, with version 8 Corel concentrated on refining the interface for greater ease of use. Online help is available in abundance. You can configure virtually every aspect of the workspace, from toolbars and dialogue boxes to roll-ups, to suit your own way of working, and pretty much any style change can be achieved by dragging and dropping.

Drawing tools have become more intelligent, switching automatically to the shape tool when you are positioned over a node and making the editing of curves an easier task. And guidelines are now treated as objects. New interactive extrude, blend and envelope tools provide an easier route to existing effects, allowing you to manipulate objects in the workspace and choose options from the Property bar.

Two new interactive tools have been added. Interactive Drop shadow lets you add a transparent, soft-edged drop shadow to any object and the Interactive distortion tool lets you warp the shape of a path and its nodes in various ways.

Ventura has long been the choice for those producing lengthy, complicated publications. Its ability to handle style attributes, indexing and revisions across multiple documents is unmatched.

Central to Ventura's way of working is the concept of tags which define style attributes for everything from text paragraphs to master page layouts. In

Ventura 8's redesigned tag window you can see at a glance all the format tags that define the look of your publication. The introduction of page tags in place of master pages makes the initial setup of documents more straightforward. Another new tag category, Rule tags, simplifies the application of rule styles to everything from frames to tables.

Ventura doesn't provide the ideal environment for the production of small, visually rich material like brochures, ads or posters but for managing lengthy, mainly text-based publications where consistency and accuracy are paramount, it's hard to beat.

Photo-Paint 8 represents more of a consolidation than a roll-out of new features. Dockers, an extension of Corel's original roll-up palettes, are tabbed palettes which, like Adobe's modeless floating versions, can be accessed at any time, grouped together and minimised to free-up editing space when not required.

There are dockers for objects, channels, scripts and on-screen help among other things. So versatile is the interface, you can set it up so that it's hardly recognisable as the same application. There is even a default setup which closely emulates Adobe Photoshop.

In common with the other packages in this suite, Paint offers features for web authors including HTML export of image maps and has good facilities for creating gif animations.

Over the past two years, Corel has concentrated hard on refining its applications interface. For its pains it has emerged with a suite of well-integrated



▲ **GRAPHICS AND TEXT COMBINE WITH EASE IN VENTURA PUBLISHER 8**

graphics applications which, at least in the case of Draw

and Paint, are respected by competitors and well liked by users. It is the layout package that is the lynchpin of these suites and everything else feeds into that. If you have the right layout package you can live with an unfamiliar vector illustration package or an image editor that wasn't your first choice.

So, if you are in the business of producing lengthy, complex documents and not committed to a competing vector illustration or photo editing application, this is for you. In other words, if you are thinking of buying Ventura, then Professional Publisher will most likely prove to be better value.

KEN MCMAHON

PCW DETAILS

★★★★

Price £595 (£506.38 ex VAT). Upgrade £395 from Ventura, Draw, Paint, WordPerfect or PrintOffice, or from Illustrator, PhotoShop, PageMaker, XPress, FrameMaker or MS Publisher.

Contact Corel 0800 973189
www.corel.com

Good Points Well-integrated suite of mature, fully-featured applications. Good support.

Bad Points Specialised layout application won't suit many.

Conclusion Broadens the options for existing Corel customers.

Alien Skin Xenofex



A superb collection of **practical plug-in** graphics filters.



Xenofex 1.0 is a collection of 16 plug-in filters for your chosen graphics package which mainly focus around natural phenomena effects while offering full customisation. Once the installation shell locates the 'plug-ins' folder of your choice, the filters will be in place in seconds. If you have no graphics package, don't worry — a complete edition of Jasc's Paint Shop Pro 4.14 is included with your purchase.

Whereas Eye Candy, a previous Alien Skin product, was mostly a bit of fun for

applying special effects to, say, your tape covers, Xenofex attempts to provide some practical filters which just happen to be great fun. Products include Crumple, which is perfect for crinkled paper effects, Flag, for a bit of texture wrapping, and Constellation for just that little bit of obscurity. All effects are

controlled via an accessible interface with drag bars and dials to alter level settings, including lighting, with the option to save your preferred settings. For the less creatively-inclined user, there are over 160 pre-sets.

Some of the more complex filters can take some time to apply so the interface offers you the chance to preview them in a fully resizable and zoomable window. Alien Skin is a master of design and provides not just a useful

tool for professional designers but a seductive and simple interface. Trust the pre-sets if you don't have the time; they are pure inspiration and a joy to use.

IAN ROBSON

PCW DETAILS

★★★★★

Price £104.57 (£89 ex VAT)

Contact Alien Skin Software 01756 704444
www.alienskin.com

System Requirements Host requirements: Adobe Photoshop 3.04 or later, Jasc Paint Shop Pro 4.12 or later, Corel PhotoPaint 8, Micrografx Picture Publisher 8. For others, visit web site.

Good Points Inspired. Time saving. Professional filters.

Bad Points A bit pricey if you're merely an enthusiast.

Conclusion Alien Skin continues to improve on its reputation for providing the best user interface for a plug-in. If you're just making tape covers, though, you could find cheaper alternatives to download from the web.

MultiModem USB



Hassle-free setup and **fax abilities** — no power supply necessary.

Modems are not always the easiest devices to install: they have a nasty habit of failing to work and internal models eat up a free expansion slot. MultiTech systems, however, has a USB modem that should make things a whole lot easier.

Installation was everything it promised to be. We simply plugged it in while the

USB connection. The PC immediately asked for the provided driver disk. With this done all we needed to do was change the dial-up networking option to use this new modem and we were up and running. In fact, we were not expecting it to be as easy as it was.

The only trouble we experienced was the slow connection speed to our Internet Service Provider. But this was fixed by updating the drivers using the provided disk, which is supplied to meet the needs of users specifically experiencing slow transmission rates.

The modem itself is flat and slim. It will comfortably sit anywhere, and you get a phone connection at the back, too, so there's no need

to unplug the phone from the wall each time you want to use the modem. It is good to see that all the necessary connectors for UK phones are provided as part of the package. Our test of its performance revealed that you won't be disappointed. With the ability to fax, and the hassle free setup, this a good modem to choose.

DAVID LUDLOW

PCW DETAILS

★★★★★

Price £116.35 (£99.00 ex VAT)

Contact MultiTech Systems 01734 597774
www.multitech.com

Good Points An easy to install, good-performing modem. You don't need a power supply.

Bad Points A little more expensive than the standard equivalent.

Conclusion A very nice little modem. For those people who don't want to mess about installing a traditional modem, this is the answer.



computer was running — you don't even need power as this is drawn from the

Nokia 9110



A well-integrated PDA/phone combination with a built-in camera connection, too.

The Nokia 9000 is well established as the leading phone/PDA (Personal Digital Assistant) combination. It looks like a rather bulky mobile phone but hinges open to reveal a keyboard and a fully functional PDA. As a phone, the 9110 is fine. It is stylish

and easy to use. On the PDA side, the only possible criticism is that its controls remain a little clunky, both in hardware and software terms.

The small keyboard is not built for prolonged writing — although enthusiasts use it for such — and the screen, now backlit but not touch sensitive. The built-in software has been updated but remains a little idiosyncratic to drive: great for confirmed 9000 freaks, but a little odd for others.



The PDA offers a wide range of functions including contacts lists, fax, SMS, internet browser, note pad, calendar and a world clock complete with map. These are nicely integrated with the phone. Find a phone number in the contact list, press a button and you're in voice contact. Write a note in the notepad and you can send it as a fax,

SMS or email to a hand-entered number or one chosen from the contacts list. This integration is where the Nokia wins hands down over any possible combination of PDA and mobile phone.

The really snazzy thing about the 9110 is its built-in camera connection facility. Take pictures with any IR-TranP compatible camera — in the UK, that means the Casio QV-7000SX or JVC GC-S1 — and transfer it by infra-red to the handset. This can then be saved as a JPEG, attached to an email and posted to friends, or uploaded to an FTP site. If you loved the 9000, you will be enraptured with the 9110.

MARK WHITEHORN

PCW DETAILS



Price £350 with connection (Cellnet or Vodafone)

Contact Nokia 0990 003110
www.nokia.com

Good Points Smaller and neater than the previous model. Great integration between data in PDA and phone.

Bad Points Small, fiddly keyboard. Clunky software.

Conclusion A great way to combine PDA and phone.

Desktop Theatre



Impressive surround sound for the PC or add it to your home theatre.

When Creative Labs introduced its SoundBlaster Live! last year, part of the upgrade kit was a set of four surround speakers. It was a good companion to the sound card and became popular. With the introduction of the long-rumoured Desktop Theatre, Creative has gone a few steps further. This kit is good enough to serve as your PC's speakers or as a capable addition to a home theatre.

The Desktop Theatre has support for Dolby Digital, Dolby Pro Logic and Creative's own CMSS standard. CMSS (Creative Multi-speaker Surround) is a technique which converts normal stereo into surround sound. Like mainstream home theatre equipment, the Desktop Theatre has four side speakers, a centre speaker and a sub woofer. There is also a decoder and amplifier.

Dolby Digital is the official standard for DVD movie soundtracks. To make use of this, the digital SPDIF output must be



taken from the sound card and connected to the decoder's input. But if your sound card does not have an SPDIF output, the next best option would be to connect the normal output to the analogue input of the decoder. But this

audio will not have the high fidelity of true Dolby Digital playback. We tested the Theatre by connecting it to the SoundBlaster Live!, a DVD player and a Denon CD audio player. Although overall quality was not as good as high-end decoders and speakers it was nevertheless impressive. The sub woofer reproduced a crisp bass with little distortion.

The Desktop Theatre provides great performance at an enticing price.

AJITH RAM

PCW DETAILS



Price £179 (£152.34 ex VAT)

Contact Creative Labs 01189 344744
www.creaf.com

Good Points Good sound quality. Supports Dolby Digital and Pro Logic. Inexpensive.

Bad Points None.

Conclusion A high-quality kit at a fraction of the cost of many systems with similar specifications.

Fujitsu Myrica-A

You deserve **loyalty points** with this supermarket purchase.

Rather than having to buy it from a mail order company, you can pick up this Fujitsu as part of your weekly shop. You'll find it in the aisles of one of 84 local Tesco stores.

The brain of the Myrica-A is an AMD K6-2, clocking in at a healthy 400MHz, proving that rather than being rendered obsolete by Intel's shift to the Slot 1 format, Socket 7 is still very much alive and kicking. This is coupled with 64Mb RAM on a single module, leaving a further two SDRAM slots free to increase this later. With current technology you'll be able to up your allocation to well over half a gigabyte without throwing away what you've already got. Unfortunately, accessing these slots is a little awkward as they sit behind the power supply, making small hands a useful asset, and one of the two free slots is obscured by a ribbon cable.

This PC's main problem is its looks. The squat case is far from attractive, which is a shame because being sold in a supermarket it is obviously destined for use in the home, where looks are an important consideration.

The case is difficult to remove. Even after all necessary screws had been taken out, it needed three people and a certain amount of prising with a screwdriver to remove it from the chassis.

The keyboard includes multimedia buttons for volume control, CD controls and application quick-launchers, although on our test machine these were not set to work by default upon arrival. In all, the keyboard feels unresponsive. The Fujitsu wheel mouse is excellent, though.

Expansion is catered for in the form of two vacant PCI and two ISA slots, and a free external drive bay of both 3.5in and 5.25in flavours.

Graphics are driven by an ATi Xpert



98 with 8Mb SGRAM onboard, using an AGP slot on the Socket 7 motherboard. The monitor is a 17in Fujitsu 772. On delivery, this needed minor tweaking to get the picture to entirely fill the screen and when running it at the 1,024 x 768 resolution, at which it was set, the image was fuzzy. Reducing this to 800 x 600 helped enormously.

The monitor performed poorly in our Display Mate tests. Although it demonstrated fairly regular screen uniformity there was slight geometric distortion in the lower left-hand corner. There was clear evidence of horizontal misconvergence and alignment errors and particularly bad screen regulation.

The on-screen display is comprehensive and incorporates three pre-set colour temperatures supplemented by a user-defined level.

The monitor's 'coffee break' feature is a nice touch: choose an interval and it will remind you when to rest your eyes.

A 56K modem keeps users in touch with the outside world. Storage is handled by the 10.1Gb EIDE IBM Deskstar drive, offering a sustained data transfer rate of up to 12Mb/sec. The

system is bundled with IBM ViaVoice Gold and an integrated headphone and mic set, as well as a disc for connection to TescoNet. The pack includes a voucher allowing users to select six free educational packages or six leisure titles from a list of 17 choices. Free home installation and a one-year on-site warranty are included.

NIK RAWLINSON

PCW DETAILS



Price £899.99 (£765.95 ex VAT)

Contact Fujitsu 01344 475555

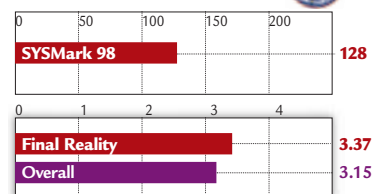
www.fujitsu-computers.co.uk

Good Points Easy to buy. Free home installation.

Bad Points Monitor. Case design.

Conclusion We had high hopes but were sadly disappointed.

PERFORMANCE RESULTS



BAPCo SYSMark Windows 98 test scores

3Com Palm IIIx & Palm V

Two new versions of this great PDA will have you spoilt for choice.

3Com has launched two new versions of its market-leading palmtop PDA. Both are designed to appeal to different users. As revealed in last month's *PCW News*, the devices are called the Palm IIIx and the Palm V.

Both new models represent minor functional advances on existing ones, which will continue to sell alongside the two new Palms, but the Palm V in particular is a significant leap forward in design. Those expecting something along the lines of the US-only Palm VII with its built-in wireless capability will have to wait a bit longer.

When it shipped three years ago, the Pilot as it was then known was an instant success and 3Com now claims over 70 percent of the world market for PDAs. The secret of this success is the company's focus on minimalism which has resulted in two evolutionary models.

The Palm IIIx in particular is similar to the existing Palm III device. It has twice the memory (4Mb) of the III, a sharper display and a slightly more rugged casing. Internally, the OS ROM and the memory blocks have been taken off the removable board and placed on the main board, making future upgrades potentially cheaper.

3Com is aiming the Palm IIIx at the corporate user primarily on the basis of its extra memory. However, most Palm users will know that it's fairly easy to fill up the 2Mb in the normal course of events and that companies such as TRG already provide excellent upgrade boards for the Palm III — up to 8Mb, which really is plenty.

The Palm V is aimed at the 'style-conscious' user. It is a beautiful piece of kit in an anodised aluminium case which at 0.45in (11.4mm) is half the thickness of the Palm III. It

weighs a mere 4oz (113g) and is simply the most elegant PDA, ever.

Instead of the flimsy 'tricorder' flip-up cover, the Palm V has a groove down each edge, in one of which sits the stylus while into the other slides the binding for the cover. What this

means is that the Palm V is ambidextrous. There are a number of accessories around that will also take advantage of these slots.

The Palm V comes with a new docking station because it has a redesigned connector and because it now comes with rechargeable batteries. This docking station has a small LED which shows you that the Palm is docked, but not when it is fully charged. It also has a hole in which you can sit the spare stylus provided.

Apparently, the new batteries last for

up to a month although a daily sync should be enough to keep them topped up. Unfortunately, our test unit turned itself on overnight and drained nearly all the power. What power remained was sucked away by the Palm turning itself on at regular intervals thereafter to say that its batteries were getting low. Thank you... very much...

Trapped on a mountain top without the cradle, I discovered that the batteries were not replaceable: if you don't have the power supply, the Palm will eventually drain and you're stuck.

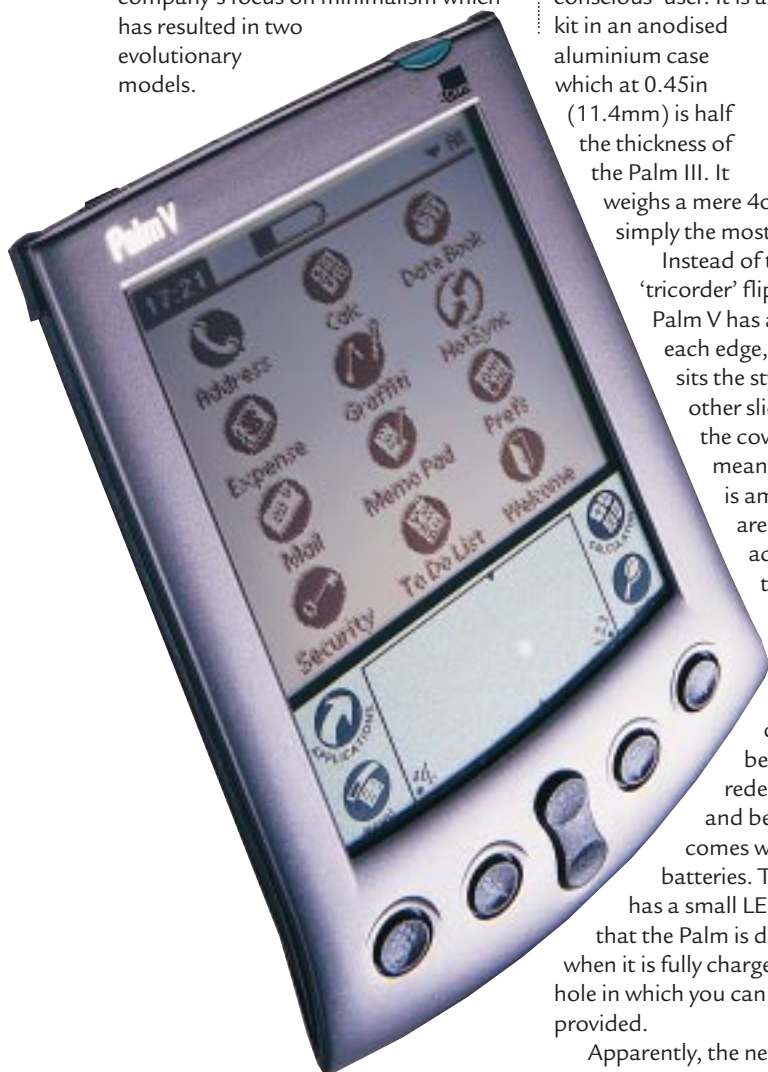
Again, the OS is essentially the same as before. I had hoped that a solution to the awkward need to switch between the serial and IR ports (some seven keystrokes each time) would have been resolved but it hasn't. The new connector also means that upgraders will have to

buy new accessories because the old Palm modem will no longer fit. And, worst of all, the Palm V has a bare 2Mb of memory with no

possibility of upgrading. Yet the Palm V remains the most glorious of the palmtops. It may not be upgradeable, it may not be colour, it may not be a Microsoft product but it is the still finest palmtop, nay, PDA, in the land.

PAUL SMITH

The Palm V is a significant leap forward in design



PCW DETAILS

★★★★★

Palm IIIx

Price £279.99 (£238.29 ex VAT)

Contact 3Com 0118 927 8200

www.3com.co.uk

Good Points A great PDA just got a little bit better...

Bad Points ...but only a little bit.

Conclusion A solid choice from the Palm range.

★★★★★

Palm V

Price £349.99 (£297.86 ex VAT)

Contact 3Com 0118 927 8200

www.3com.co.uk

Good Points Simply the sexiest PDA ever.

Bad Points Not upgradeable. Not a great functional leap forward.

Conclusion Gorgeous but expensive.

Armari NBX-500 SK

A big, beefy Pentium III workstation with a monitor that's a joy to view.

Armari is one of the few PC vendors around that has built its reputation more on high-end PCs than super value budget systems. And, given the kind of system you can buy for £1,000 these days, the NBX-500 at twice that price certainly represents the upper third of the market, but it's not silly money.

The heart of the NBX-500 is, as the name suggests, a 500MHz Pentium III processor. At the time of writing, there's no tangible benefit from the new instruction support with which this processor is blessed since Intel has once again fluffed its co-ordinated rollout arrangements with software vendors. It's an identical situation to that of the MMX Pentium's release in 1997 but the hike in clock speed and slight architectural tweaks lead to a small but significant performance increase and make it worth getting one now, and KNI (Katmai New Instructions) support will certainly be appearing before long.

Aside from the Pentium III, the rest of the NBX-500 is well specified. There's 128Mb of SDRAM in a single DIMM, leaving two free sockets on the SuperMicro P6SBA motherboard.

Avoiding the expense of SCSI, mass storage takes the form of a 7,200rpm IBM DeskStar 14GXP. This is an UltraATA/33 drive and gives you 14.4Gb

with which to play. Armari has configured the drive as two 7Gb partitions.

The final core component in the machine we were sent was an ATI Xpert 128 with the brand new Rage 128 chipset. The Xpert 128 has 16Mb of video RAM but the final unit will ship with the Rage Fury 128, which sports 32Mb. The core chipset is the same, however, and it's exceedingly impressive, trouncing the former 2D/3D king, nVidia's Riva TNT.

A Panasonic DVD-103S DVD-ROM drive occupies one of the front panel expansion bays. This will read DVDs at six-speed and CD-ROMs at 32-speed. It lacks a CD tray, sucking discs inwards in the manner of a car CD player, but we can't really see the point.

The system's supporting peripherals take the form of a Diamond Monster Sound MX300, which is Diamond's answer to Creative's SoundBlaster Live, coupled with the increasingly familiar Cambridge SoundWorks FourPoint surround speakers. The combination provides excellent sound. Diamond also supplies the 56K SupraExpress Pro internal V.90 modem.

One aspect of this machine which should definitely not be overlooked, and which represents a considerable percentage of the price tag, is the 19in Iiyama Vision Master Pro 450 monitor. This is a superb display, using Mitsubishi's Diamondtron NF (natural flat) tube which gives a near-perfect flat screen in

vertical and horizontal directions. Coupled with the Xpert 128 card, the unit defaults to a 100Hz refresh rate at 1,280 x 1,024 resolution in 32-bit colour. Impressive though this is, there's not much point to it and reducing the vertical refresh to 75Hz affords noticeably better image quality since the frequency of the video signal is reduced, giving the display circuitry more headroom.

A good-quality Key Tronic keyboard and similarly high quality three-button Logitech mouse handle user input. We would have liked to have seen a mouse with a middle wheel, though, on a system costing this much.

Inside the tower case the system is tidily built. We were disappointed to note that the hard drive had been mounted in the only expansion bay with an accompanying free 3.5in front panel cut-out despite the fact that two internal 3.5in bays were free.

Aside from Windows 98, the system was not supplied with software. But even so, the Armari's price represents reasonable value for money when taking into account the hardware specification.

DAVID FEARON

The Armari's price represents reasonable value for money

PCW DETAILS

★★★★★

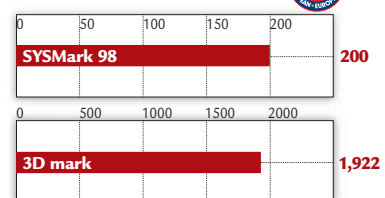
Price £2,349 (£1,999 ex VAT)
Contact Armari 0181 810 7441
www.armari.com

Good Points Pentium III. Excellent graphics card. Superb monitor.

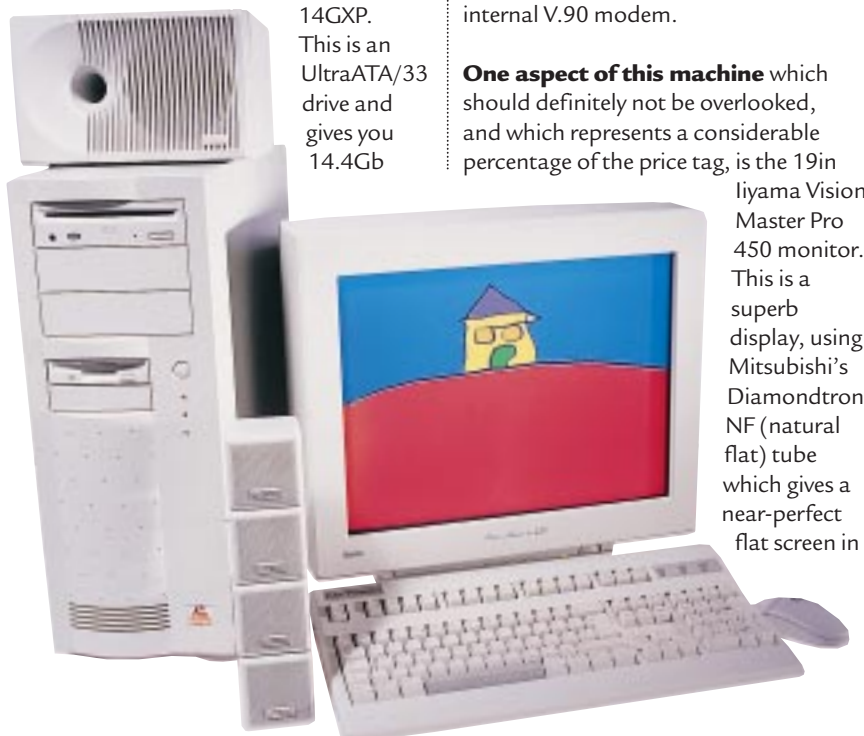
Bad Points A high-end user might prefer SCSI. The hard drive blocks a 3.5in front panel bay.

Conclusion If you're looking for something more than the usual £1,000 system, the NBX-500 represents a good step up.

PERFORMANCE RESULTS



BAPCo SYSMark Windows 98 test scores



EXCLUSIVE

Macromedia Fireworks 2

BETA

This will add **extra sparkle** to professional web pages.

Fireworks 2 and Dreamweaver 2 (see PCW, April) share a common interface so users of either package will have no problems switching between the two. Indeed, they are so well integrated that an option to 'Optimise Image in Fireworks' will be added to your Dreamweaver Commands menu.

This product is aimed primarily at the professional web designer although the price should leave it well within the reach of the serious home user. New additions are here in abundance. The export dialogue box now allows users to view four versions of their image on screen at once. Differing compression ratios can be applied to each on an individual basis and it is easy for the user to select the best output. Also new is the ability to compress files to size. Give Fireworks an upper file size limit and it will tailor your image to fit.

Restricting your image to a web-safe palette when saving will ensure that it can be displayed without problem in common browsers. It may mess with specific tones, though, such as those required for corporate logos. Fireworks overcomes this by allowing users to lock non-web-safe colours before switching to the safe palette. These locked colours will then be appended to the palette so that while the majority of the image is web safe, the important sections retain their original shading. This same area of the package can be used to specify the colours to be discarded in generating a transparent GIF.

Hotspots can be drawn in the conventional way but Fireworks can also identify the boundaries of image objects and use these to generate irregular polygon hotspots, exactly tracing the object boundary and making it easy for the user to create incredibly intricate hotspots which might previously have taken hours to map.

Fireworks employs a number of time saving options for saving your settings. For example, save your compression ratios from the Export dialogue to use on future files without having to create them

It has the ability to apply multiple effects to a single object

from scratch. Save the effects you have applied to an image object to ensure that they can be applied exactly to other objects for a uniform look and feel. It even lets you save batch processes.

Batch processing is a way of instructing the package to execute the same command across a number of image files. This could be replacing certain words, globally swapping one particular colour for another, or altering multiple references to a URL that may have been relocated. It can be set to process all your open files or, to save the time of having to open the files manually in advance, you could point it in the direction of a number of files even if these span disks or servers on a network. Each will be processed without further user intervention.

The most important innovation in this new Fireworks is, perhaps, the ability to apply multiple effects to a single object. In the original release it was possible to apply only a single effect. Each effect can be further customised to generate an almost infinite range of styles which once set can be saved as a custom style to be applied to further objects,

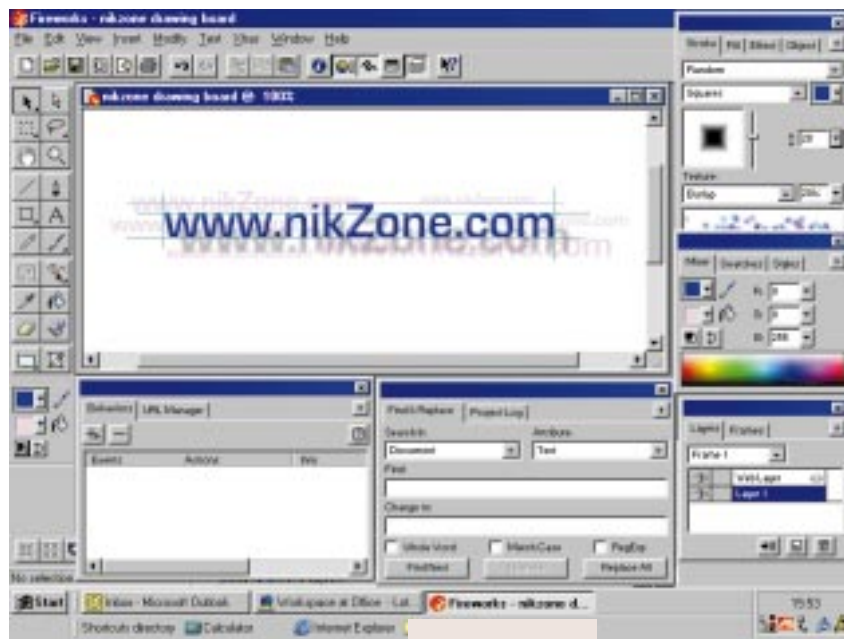
▲ GENERATE SPECTACULAR EFFECTS IN SECONDS, EVEN AS A BEGINNER

saving time and ensuring a consistent look to all graphics on a site. Images can be sliced so that different

compression ratios can be applied to individual sections and the various parts can even be saved as different file formats. The HTML code needed to stitch them back together in a browser can be saved alongside and tailored to match the way you work, so that it can be seamlessly integrated into your pages.

Users of the original Fireworks may wonder why an upgrade for this already extensive package is necessary, but after a few hours playing with the extended features of release 2, all will become clear. A worthy purchase both for first timers and those upgrading.

NIK RAWLINSON



PCW DETAILS

BETA

★★★★★

Price £139 (£118.29 ex VAT)

Contact Computers Unlimited
0181 358 5857, www.macromedia.com

Good Points Plenty of new features. Still as easy to use as ever.

Bad Points Although effects can be tailored it would be nice to have more than five basic effects starting points.

Conclusion Enough to justify a purchase or an upgrade.

Dan Dantum 500/D

This **superfast PIII machine** has a hard drive the size of Desperate Dan.

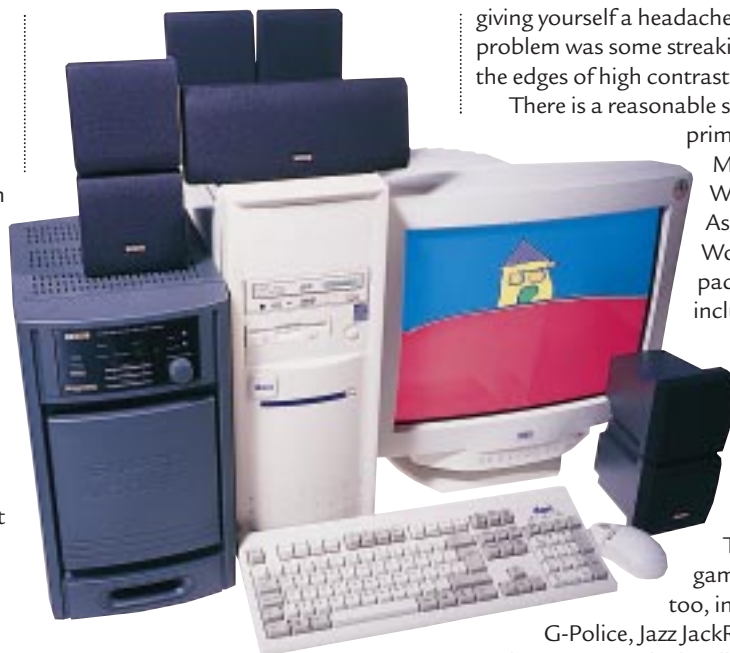
The major vendors have been quick off the mark getting us systems based around the Pentium III, and Dan is no exception. One of the most noteworthy features of the Dantum from a performance point of view, aside from the 500MHz Pentium III, is the inclusion of a Western Digital (WD) hard drive.

Although WD has always had a reputation for reliability, the performance of its drives has slipped behind the competition during the past year or two. But with the new models it looks as if this trend may be reversing: the AC418000 drive included with the Dantum not only spins at 7,200rpm, but also supports Ultra ATA/66 allowing maximum burst transfer rates of 66Mb/sec, rivalling the fastest SCSI standards. Frustratingly, the system's SuperMicro P6SBA motherboard doesn't support the feature, but you're at least safe in the knowledge that future upgrades will allow the drive to reach its full potential.

Not only does the drive support the latest technology, it's also huge at 18Gb which is easily enough space to enable realistic levels of video editing, or to have a dual-boot system consisting of Windows 98 and NT, with as many applications as you like installed on both operating systems.

Like Armari's PIII machine (reviewed on p97), the Dan sports a graphics card based around ATI's new, impressive Rage 128 chipset. But fitted to the Dantum is a Rage Magnum rather than a Rage Fury. Like the Fury, it's fitted with 32Mb of video memory. Dan has built in a SX Creative DVD-ROM drive and the full Creative Encore Dxr2 DVD package which includes a separate MPEG2 hardware decoder board with TV output as well as the drive itself.

Even better for the PC-based DVD movie enthusiast is the TEAC PowerMax 1000 speaker setup. This consists of five satellite speakers and a subwoofer.



There's even a remote control for correct setup of sound levels from the listening position. The system will decode signals from a Dolby Pro-Logic soundtrack, but unfortunately cannot take advantage of the Dxr2 card's digital S/PDIF output for Dolby Digital AC3 films. The system's second source of audio is Creative's SoundBlaster Live Value PCI soundcard. A generic 56K internal ISA modem completes the peripheral picture.

The system includes 128Mb RAM on a single DIMM module, leaving two sockets free for future upgrades. Sharing the front panel bay with the DVD-ROM drive is an LS120 SuperDisk drive which accepts 120Mb disks as well as standard 1.44Mb floppies. The internals of the machine are laid out neatly enough,

and the EIDE and drive power cable are neatly routed around the casing to keep them out of the way.

The monitor is the most important part of any PC and the 19in CTX unit shows impressive focus and resolution, making it feasible to run your Windows desktop at a resolution of 1280 x 1024 without

giving yourself a headache. The only problem was some streaking effects at the edges of high contrast areas.

There is a reasonable set of software, primarily

Microsoft's Works Suite 99. As well as the Works 4.5 package, which includes a capable spreadsheet and word processor, Works Suite has Word 97 and Money 99, too.

There's a good games bundle, too, including

G-Police, Jazz JackRabbit 2 and Red Line Racer, which will keep the casual gamer occupied for a fair while.

Although it doesn't have the superb Iiyama monitor of the Armari system, those DVD extras, the larger hard drive, software bundle and slightly lower price certainly make it one to consider, particularly for the first-time user with a reasonable budget.

DAVID FEARON

PCW DETAILS

★★★★★

Price £2,143 (£1,824 ex VAT)

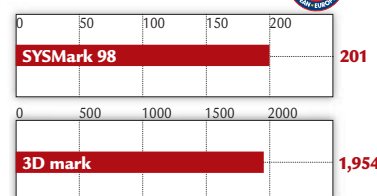
Contact Dan Technology 0181 830 1100
www.dan.co.uk

Good Points Great setup for DVD movie fans. Superfast processor and graphics card. Huge hard drive.

Bad Points Hard drive's abilities hindered by the motherboard.

Conclusion It's not exactly cheap, but if you're a new user blessed with deep pockets, the Dantum fits the bill nicely.

PERFORMANCE RESULTS



BAPCo SYSMark Windows 98 test scores

IBM Small Business Suite for Windows NT 1.0

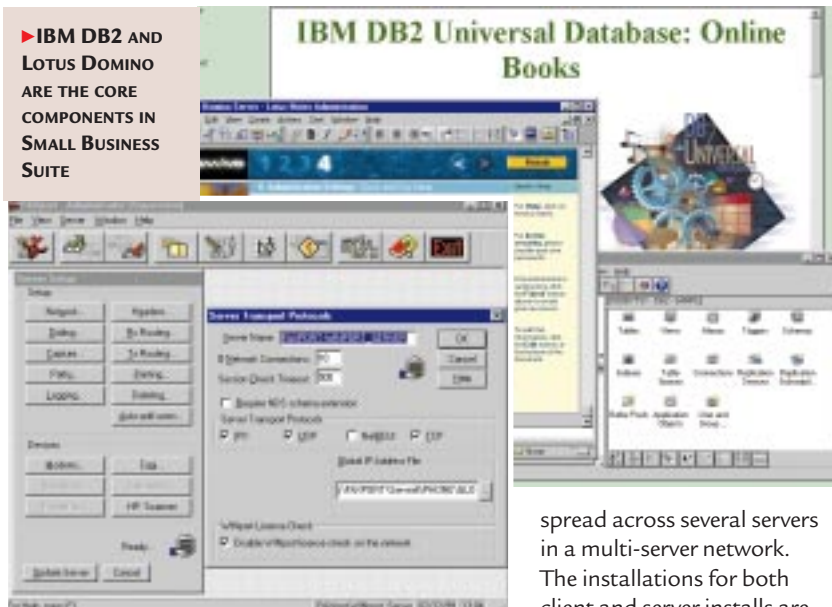
A solid, flexible **network solution** forming a good base for future expansion.

IBM Small Business Suite for Windows NT is now shipping. It is very like the small business server products from Microsoft and Novell, but without the server. Although you have to buy Windows NT Server 4.0 separately, the IBM version is good value for money considering the quality of the products in the package. Small Business Suite has all the functionality of its competitors, with email, groupware, database, fax and modem communications services all integrated into a package that is easy to install and use.

The core components in Small Business Suite are Lotus Domino Release 4.6.2 and IBM DB2 Universal Database 5.2. The fax- and modem-sharing software comes courtesy of LANSource Winport and LANSource FAXport servers. The Netscape Navigator 4.05 web browser is included. Lotus SmartSuite Millennium Edition is provided as an optional extra in case an office application suite is required. IBM adds a set of five application templates, too, which can be put to use as is, or with minimal customisation. The templates are Domino applications which integrate Domino and DB2 to provide a discussion database, a document library and customer contact tracking. Software licences for up to 100 concurrent users are included.

The main difference between the Microsoft/Novell small business server approach and IBM Small Business Suite is not so much the absence of a server operating system in the package, as the target audience. While a small business can easily install Small Business Suite and be up and running with an office network solution, it is more obviously targeted at resellers, consultants, and systems integrators. The idea is to give them the basic set of applications and services which they can install quickly, while allowing for customisation and special applications. To this end the suite comes with a tool called the Integrated Installation Pack with which standard and customised installation packages

► **IBM DB2 AND LOTUS DOMINO ARE THE CORE COMPONENTS IN SMALL BUSINESS SUITE**



can be built. A customised installation package would comprise a subset of the Suite components, either by itself or with added third-party applications. When you use IIP to create a package, it runs through a sequence requiring you to identify the target systems, the package contents, whether additional applications will be included and whether the install will be attended or not.

The standard install of Small Business Suite is an IIP package which initiates the installation process with a minimum of questions and then runs through the five distribution CDs, installing the complete set or the subset you requested. A complete install requires about 600Mb of disk space. This works very well and takes under an hour to complete if you fed in the CDs by hand, as I did. You can also copy them to a file server and install from there. The whole server, including communications, was virtually completely set up and ready to go, so much so that it took me a while to realise that the FAX server was answering my incoming calls!

To use IIP you need 2Gb disk space where IIP can create installation images. These are installed over the network to clients or other servers. When the server components of Small Business Suite for NT are being installed, they can be

spread across several servers in a multi-server network. The installations for both client and server installs are

triggered with an installation diskette which IIP creates as part of the process of building an installation image.

Small Business Suite is the junior partner to the IBM Suite for Windows NT and the Enterprise Suite for Windows NT. This combination of IBM and NT is not as strange as it might seem to those who remember the war between OS/2 and NT. IBM is one of the few Microsoft associates authorised to self-certify the integration of NT products.

TERENCE GREEN

PCW DETAILS

★★★★★

Price Server licence £371.30 (£316.00 ex VAT), Client licence £74.00 (£63.00 ex VAT)

Contact IBM 01329 242728

www.software.ibm.com/is/mp/nt/suites.html

System Specification Pentium-class CPU (200MHz recommended), NT 4.0 Service Pack 3 or later, 64Mb RAM (128Mb recommended), CD-ROM drive or LAN connection for installation.

Good Points Good solid applications; a sound base for expansion.

Bad Points Aimed at a more technical user than Microsoft Small Business Server.

Conclusion The suite makes a lot of sense for resellers and consultants looking for a solid applications platform. Technically savvy end-users will also appreciate it.

NetObjects Fusion 4

Web authoring

Great for **e-commerce** entrepreneurs to make a web presence.

If you're looking for a single reason to buy this product, then it should perhaps be its handling of e-commerce sites: components can be dragged and dropped onto your pages from a dedicated toolbar. NetObjects has worked hard to ensure that users wanting to set up their own online shops in this way can easily incorporate the services of iCat, based in Seattle, USA, that will handle the necessary credit card transactions, passing the proceeds on to the site owner's card.

If this sounds a little expensive, don't worry: smaller sites with ten or fewer items for sale will not be charged a setup fee, and will be hosted free. It also allows users to incorporate IBM HotMedia components to make the site more interactive, with zoomable images and 3D objects. All add-on components can be installed as needed, to save cluttering the PC with unused objects during the first install.

Site styles have always been one of Fusion's strengths, and in this latest version the range has been expanded to include many new, more businesslike examples. Most are very suitable, although when using stock elements like this, there's always the risk that your site will look exactly like several others elsewhere on the net.

Each style can be customised and individual elements can be swapped for alternative graphics. As ever, Fusion tailors these on-the-fly to incorporate headings and graphical links to meet the specific requirements of your own site in a matter of seconds. For example, add a new page to your site, and all pages will have a graphical link added to point back to the new page. Many of the unmodified styles include rollover buttons, giving any site a professional look without the hassle of JavaScript programming.

Fusion 4, like its predecessor, works on a 'whole site' basis. Instead of constructing individual, standalone pages, each new page is immediately considered a part of the site. In this way,



users can navigate their partially finished site to check the overall look and feel. Sites are saved in their entirety to ensure a logical structure and save users from losing individual parts.

Users of Fusion 3 will find the version 4 interface familiar and easy to use, as it employs the same toolbars and layout properties dialogue box. Similarly, it makes use of the same easy-to-understand methods for generating imagemaps. Once an area has been defined, a list of all pages belonging to the site will appear, from which the user may select the relevant destination or enter the location of an off-site address.

Version 4 retains Fusion 3's image handling conventions. The usual option of stretching or contracting an image when manipulating the picture borders is supplemented by a 'crop' feature which will slice the picture to fit within a defined frame, discarding anything falling outside of that area.

A range of predefined sites allows users to load a template site to suit a particular need, such as a corporate presence. All commonly needed pages will be generated and linked. The user then need do nothing more than replace the sample text and images with their own content.

▲ GENERATE PAGES QUICKLY AND EASILY USING FUSION'S STYLISH STYLES

Tables are handled well. Cells can easily

be resized, just as if you were resizing a table in Word. Merging and splitting cells is similarly easy. Once a number of adjacent cells have been selected, the user need only right-click within them for the manipulation menu.

We were impressed with Fusion 4. It's a valuable addition to the range of web authoring packages on the market today. We were unconvinced that users of Fusion 3 should be rushing out to upgrade, though, unless dedicated to generating online e-commerce solutions.

NIK RAWLINSON

PCW DETAILS

★★★★★

Price £233.83 (£199 ex VAT); upgrade £81.08 (£69 ex VAT)

Contact NetObjects 01189 823822
www.netobjects.com

Good Points E-commerce integration. Businesslike styles.

Bad Points None to speak of.

Conclusion Great for the business user, but home users may be happier with competitors' products.

Canon BJC-2000

This little Canon's a real cracker.

This printer is tiny and should find a home on any desk, and the quality of its output will ensure that home is well deserved. Considering the price, we were very impressed. On photocopy paper, standard quality text was excellent with clean, crisp edges and smooth curves on larger characters. Text as small as 4pt size was legible. Five pages at this quality setting arrived after just 1min 52sec. Upping the quality to the best possible increased the time to 7min 43sec, although it made very little difference to the standard of the output. We would be more than happy to stick with the standard setting.

Photo reproduction was handled well. Using the bundled colour cartridge rather than the optional extra photo cartridge, super quality on glossy photo paper produced the sort of results normally achieved by far more expensive printers. Skin tones were realistic and

colours were vivid, with smooth transitions between light and dark areas. There was no discernible evidence of bleeding where darker and lighter colours shared a



common border. Neither was there evidence of visible banding. Surprisingly, at 10min 1sec, this SuperPhoto quality image arrived 24 seconds faster than the lower quality Photo image.

The printer is bundled with a 50-sheet page feeder and a holder for spare cartridges. It holds two ink-wells (CMY and black) simultaneously in a single head which can be swapped for an optional scanning module capable of scanning at a maximum optical resolution of 360dpi. In all, a very impressive piece of kit.

NIK RAWLINSON

PCW DETAILS

★★★★★

Price £139.83 (£119 ex VAT)

Contact Canon 0121 666 6262

www.canon.co.uk

Good Points Small. Cheap. Great quality.

Bad Points None.

Conclusion We loved it.

HP Capshare 910

This hand scanner's a bit quirky but it's very easy to use.

Hewlett-Packard (HP) describes its CapShare 910 as an 'Information Appliance' — a horrendous phrase. It's a rather clever device though, so we'll forgive the marketing team.

The 910 is a cordless and significantly more cunning version of the long-retired hand scanner, a device which overcame its narrow capture window by stitching together strips of a bigger image. Sadly,

the stitching software was often far from foolproof and the concentration needed to drag the unit in parallel strips was comparable to that of a world chess final.

The 910's Sin scanning window may still be narrow, but two optoelectric sensors monitor the 910's every move and allow the user to capture entire A4 documents in a single U-shaped swoop — the device is remarkably tolerant of casual changes in speed and direction during scanning. Six seconds later, the built-in software has seamlessly rebuilt the page, compressed it and stored it at a sufficient resolution to read, print or OCR. Up to 50 pages can be stored in the 4Mb memory, examined closely on the 45 x 45mm display and rotated or deleted as desired.

Now you've captured, you'll want to share. The IrDA compliant infra-red port can beam documents straight to infra-red printers or notebook computers. A serial cable is provided

for blind PCs. The supplied PC software won't perform OCR but it does store the received mono bitmapped pages in Adobe Acrobat format.

It may eat its rechargeable AA batteries at a rate of knots, cost £500 and capture in mono only, but the 910 is dead easy to use and a unique product that will be welcome in the briefcases of mobile professionals.

GORDON LAING

PCW DETAILS

★★★★★

Price £499 (£424.68 ex VAT)

Contact HP 0990 474747

www.capshare.hp.com

Good Points Remarkably tolerant when scanning.

Bad Points Battery hungry. Mono. No OCR software.

Conclusion Unique product for mobile professionals.



Kai's Photo Soap 2

Image manipulation



The simple way to slip into **photo editing** and picture file management.

Images can be loaded into Soap from disc or any TWAIN-compliant device, but the Input menu also contains a direct link to the PhotoDisc web site. A great feature is its ability to open a whole folder rather than an individual file. This imports every image in the folder onto the Soap desktop ready for editing. Here, thumbnail images can be organised into piles, moved around the screen and resized to make managing your work easy. The useful transport area at the foot of the screen is used to store images while they are moved from one area of the program to another.

Adjusting images is simply a matter of dragging them from the transport area into the 'Clean' room. Here, a wide range of tools can be implemented simply by clicking an icon. The more you click, the more the icon changes the relevant attribute — hue, saturation, sharpness etc. To change just part of the image rather than the whole thing, the bucket tool can be used to select an area. This is similar to the eyedropper in other graphics packages but has a variable tolerance based on colour and contrast, allowing users to select more or less of the image using a slider, without having to click on multiple areas.

All alterations are made on a separate layer so they can be removed quickly and easily. Photos can be laid out in an album just like their paper-based equivalents. A range of 24 standard albums can be customised with captions for each photo and, once complete, can be printed or output for use on the net. Likewise, the photo desktop, the area into which images are initially imported, can also be exported in its entirety. This is saved as a neat JavaScript application which, when run in a compliant browser, allows users to interact as though they themselves were using Soap. Although they cannot alter your images, they can select them, move them around the desktop and open them for closer



▲ THE UNUSUAL
KAI INTERFACE
GIVES THIS PACKAGE
A FRESH,
UNCLUTTERED FEEL

inspection. Net-based users of exported albums are able to turn pages as though using the Soap-based equivalent.

When exported for use on the net, images are optimised according to user

specifications, the desktop can be fixed at preset screen sizes, and attributes such as email addresses, links and

page titles can be set for display within the page. The JavaScript it creates is clearly laid out, well implemented and works well with up-to-date browsers.

Photo Soap 2 can act as host to all Kai's Power Tools plug-ins up to and including the most recent version 5. It can also utilise all Adobe PhotoShop compliant plug-ins, such as those from Alien Skin, making this a cheaper, although less versatile, alternative to the Adobe option. Printing capabilities have been improved, too. Users can now print from any part of the package and output to a far wider variety of paper sizes than was previously possible.

Image information can be appended to all files and used to sort pictures into logical order. Users may also add a 'beauty scale' rating, ranging from zero

to ten so that

favourite pictures can be set to appear before less popular examples, giving users quick access to their most commonly used files.

The Soap Talk feature connects users around the world so they can discuss the package and solve each others' problems, although MetaCreations insists that it will maintain its levels of conventional technical support. Help files are well presented and easy to follow, although the package is so intuitive that many users will never need to refer to them.

NIK RAWLINSON

PCW DETAILS



Price £39.99 (£34.03 ex VAT)

Contact Computers Unlimited
0181 358 5857 www.metacreations.com

System Specification Pentium processor, Windows 95/98/NT4 (SP 3+), 32Mb RAM (64Mb for NT), 100Mb hard-disk space, 16-bit colour display, 800 x 600 resolution, CD-ROM drive.

Good Points Easy to use. Support for PhotoShop plug-ins. Inexpensive.

Bad Points None to speak of.

Conclusion Looks great, works well. Ideal for the home digital photographer.

MAG LT 541F

More picture on the panel — just **spin it** the other way.

A TFT display with a 15in viewable area, the LT1541F has a 0.297mm dot pitch. Its optimal resolution is 1024 x 768 at a colour depth of 16 bits. The panel has a distortion-free viewing angle of 40°.

Moreover, the display

can be rotated a full 90°, which means you can view the screen in landscape or portrait format. In portrait mode, this 15in panel is capable of displaying an entire letter-sized page while still being barely taller than a standard 21in monitor. Conventional 15in monitors are able to display only around 60 percent of a page that size.

Setting up the Mag TFT panel is an easy process. It comes with a DC adaptor and two floppies hosting a display auto alignment utility. Although this software is not absolutely necessary, using it will produce an appreciable difference. There is also a copy of Mag Portrait software in the box.

The pushbutton controls located at the top of the screen are easy to operate in conjunction with the clear on-screen display. All the basic settings such as brightness, contrast and clock frequency can be easily adjusted. Moreover, the

three basic colours (RGB) can be manipulated individually.

The overall quality of the Mag flat panel is excellent. In our tests, the image remained sharp throughout the whole length of the screen. The display handled graduated tones of colour equally well.

With these qualities in mind, if you are in the market for a decent flat panel display, the Mag LT541F is well worth consideration.

AJITH RAM



PCW DETAILS



Price £820.15 (£698 ex VAT)

Contact Mag InnoVision UK
0118 9752445 www.magin.co.uk

Good Points Excellent quality. USB connector. Wide viewing angle.

Bad Points None to speak of.

Conclusion A 15in flat panel that could easily be the best in its class.

Pace 3D Edge

For PC life on the edge, this **graphics card** may not look sharp enough.

Perhaps one of the best-known brands in the graphics-card market is 3Dfx, but its reputation is mainly in the niche market of gaming. The high volume OEM market is dominated by rivals ATI, S3 and Matrox.

The Banshee chipset from 3Dfx is the company's first attempt to carve a slice of

this lucrative segment. The 3D Edge graphics card from Pace is built around the same chipset.

The Banshee has some similarities to

the more famous 3D-only Voodoo2 card from 3Dfx. It has essentially the same rendering engine as the Voodoo2 but one of the two texturing engines is absent. This means that the Banshee cannot handle single-pass multitexturing. So, in games like Unreal and Quake 2 which use multitexturing, there will be a significant performance hit. Also, unlike the G200 from Matrox and the TNT from nVidia, the Banshee supports only AGP 1X. It also lacks a full OpenGL ICD. Despite these obvious limitations, this Pace card is worth a look due to some extra features. In addition to 16Mb of SGRAM, it has a video-out port, which will be of interest to gamers. A copy of Wargasm is included.

The 3D Edge, despite its name, did not produce cutting edge performance. With a 3DMark99 benchmark test score of 1124, it's faster than the Matrox

Millennium G200 but much slower than graphics cards based on the TNT chipset. And as the Banshee does not support 32-bit colour, picture quality is not quite top notch.

AJITH RAM

PCW DETAILS



Price £99 (£84.26 ex VAT)

Contact Pace 0990 561001 www.pace.co.uk

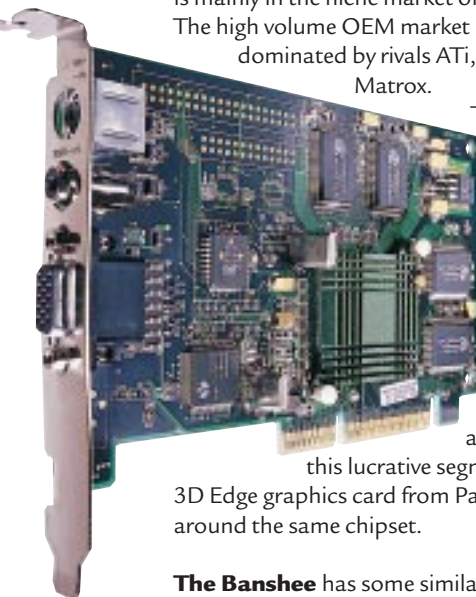
Good Points Decent performance. TV-out.

Bad Points No OpenGL ICD. Lacks 32-bit rendering. Does not support AGP 2X.

Conclusion A graphics card that's let down by a chipset which lacks some crucial features.

PERFORMANCE RESULTS

1000	1050	1100	1150	1200
3DMark99				1124



Wired up or wire-less?

Mobile computing choice

If you travel out of the office a lot with a mobile computer, you probably spend too much time fiddling with cables and Windows setup issues. Back in the sixties we called this 'getting wired'. It meant that you were uptight, man.

The wired person is usually to be found with one end of a cable in hand casting around for a data port. It isn't cool, and it doesn't get any better when you find the right port and start plugging in all those network, modem and power cables. Suddenly your desk looks like the cable guy's workbench. It's about as hip today as an Afghan coat. The solution is to get *unwired* — to lose the cables and go wireless. Not only that.

Lose the laptop, too. Replace it with a Windows CE Handheld computer hooked up to a Citrix MetaFrame server over a wireless network. We chose Proxim because it's fast, and the latest round of Windows CE Handheld Pro devices come with Proxim and Citrix support built in.

Suddenly, your desk looks like the cable guy's workbench

▼THE PROXIM ACCESS POINT WIRELESS NETWORK RECEIVER

On the face of it, a Windows CE box is never going to impress your average laptop power user, but there's very little that you can do with a laptop that you can't do with the aforementioned setup. You're still running the same applications but now you're running them on the server, so they only need to be installed once for everyone to access

them. There's only one system, the MetaFrame server, to configure.

The Windows CE Handheld is instantly ready when you switch it on. There's no waiting for it to boot up or to come out of hibernation. And you get battery life that laptop owners can only dream about. There are some drawbacks, though: you might need to review your addiction to RealPlayer streaming audio and video clips of product announcements.

When you get right down to it, wireless networking is the only way to go with a handheld device.

They're meant to be carried around, not just out of the office, but everywhere: into meetings, to the boss's office, out to the car park. Doing the laptop thing where you unpack a bag full of cables and wire it up like an intensive care patient just doesn't mesh with the handheld style.



▲METAFRAME SUPPORTS LOW-BANDWIDTH CONNECTIONS DOWN TO 14.4KBPS

When you add Citrix MetaFrame to

this combination, you free the Windows CE device from its dependence on Pocket versions of real applications, and allow it to access and run real Windows applications: Microsoft Office, Lotus SmartSuite. The Citrix client enables you to connect to the MetaFrame server over virtually any network medium, from dial-up to wireless.

Since MetaFrame is designed to support low bandwidth connections down to 14.4Kbps, you can access the same applications with better than acceptable performance via modem when you're away from the office. OK, so your cellular data modem might be on the cusp of acceptability, but that still only leaves you with a single cable to tote. And let's face it, if a cable-heavy laptop on the desktop is a fashion disaster, it's even worse with one of those cute little handheld systems.

When you're in the office, the ideal wireless solution for Windows CE Handheld Pro devices is the one that's been integrated into almost all of the



Wired vs wireless working — the pros and cons

➤ WIRED:

For

- ✓ Fully standardised.
- ✓ High bandwidth: 10Mbps and upwards.
- ✓ Relatively easy to expand bandwidth.

Against

- ✗ Configuration includes laying wiring.
- ✗ Most homes and small businesses not easily wired.
- ✗ Fixed access points.

➤ WIRELESS:

For

- ✓ Easy integration with wired Ethernet networks.
- ✓ Inherently supports roaming.
- ✓ Can be shipped preconfigured to work 'out of the box'.

Against

- ✗ Slower than wired: 1Mbps and 2Mbps at present.
- ✗ Growth in performance limited by radio spectrum.
- ✗ Possibility of signal degradation due to absorption, especially outdoors with rain, etc.

latest Windows CE Handheld Pro systems, Proxim RangeLAN2. It's a fast, low-power wireless medium designed for mobile users.

When I inserted the RangeLAN2

PC Card into the Sharp PV-5000 used for testing, it was automatically recognised and configured. As the Proxim Access Point was already connected to my Ethernet hub, the Sharp was on the LAN via a wireless link moments after I installed the RangeLAN2 card. Having installed the Citrix client provided by Sharp, I could log in to the MetaFrame server and run standard 32-bit Windows applications.

Proxim RangeLAN2 operates in the unlicensed 2.4GHz waveband allocated to wireless LANs of up to 100milliwatts worldwide. It has a maximum range of 500 feet indoors and 1,000 feet outdoors. RangeLAN2 delivers a fat 1.6Mbps pipe, which happens to be more than the Citrix client needs but you might want to shift files around at times. The Citrix client technology has a low bandwidth requirement because it works by executing the application

on the server. Only the display interface is sent over the network to the Citrix client on the Sharp, and then only as a series of screen drawing commands rather than bitmaps.

Likewise, the only data flowing back to the server from the client are the keyboard and mouse inputs. Since the Sharp PV-5000 is a Handheld Pro system, it has a full 640 x 480 colour VGA screen, so you're not cramped for style. It's an 8.2in backlit LCD touch-screen, too; viewable without squinting. There are Citrix clients for the smaller half-screen handhelds, but it has to be said that if you're looking for a full-function replacement for a laptop, the keyboards on the larger Handheld Pro systems are just that bit more usable.

If you're totally disconnected and have to work on the Sharp, the bundled software comes in useful. It had Microsoft Pocket Internet Explorer for web browsing, Pocket Access for data, and the Pocket PowerPoint Viewer. Sharp provides a PC file viewer to view email attachments, and an image editor with MPEG support. It also offers a Colour Digital Camera attachment as an optional extra.

At 1.22kg (2.7lbs) the Sharp PV-5000 I used is a lot easier to carry around than any laptop, even the new lightweight systems. In truth I'd prefer something lighter still, but that's going to have to wait for better battery technology or solar panels or something, because the bulkiest item must be the rechargeable Lithium-Ion battery which is good for a full day's work. The rest of the spec is fairly standard. Connectivity options are covered by a serial port, IrDA port

and PC Card Type II slot. There's a choice of 16Mb or 32Mb RAM, but sadly no internal fax/modem

in the model we had — that's limited to North America for now.

Although I liked the Sharp PV-5000 a lot, it's not an essential part of the mix. The Proxim wireless LAN software and Citrix MetaFrame certainly are. Without these two technologies, the handheld is a far less functional item. One important point to note: this is not yet a small business proposition. Cost is still an issue because wireless LANs have yet to become a volume market. As a result, the initial outlay means it will appeal mostly to companies with several mobile computer users. Although at first glance the initial outlay seems to suggest that it's an expensive alternative to regular laptops, when you do the sums and factor out the time you won't be spending maintaining Windows 98 laptops, it's a winner.

➤
TERENCE GREEN

Wireless LANs have yet to become a volume market



➤ **FAST, LOW-POWER
WIRELESS WORKING
WITH RANGELAN2**

Wireless networking technology

Wireless LANs have been around for a long time but they've largely been consigned to niches: vertical applications such as stock-picking in warehouses, or in sites where wiring either isn't allowed (an historic building, say) or is uneconomic. Now everything is changing. Computing devices are becoming more varied and more consumer-orientated.

Mobile phones, handheld organisers, set-top boxes and digital cameras are only the first wave of application-specific devices with built-in computing and communications intelligence. Inevitably they will be followed by an increasing number of function-specific 'appliances' aimed at volume markets both in the home and in business. Wired connections just aren't going to cut it.

Most existing homes and small businesses cannot easily be wired for

networking, but the more compelling reason for a wireless solution is

that it's a better fit for the usage pattern of computing appliances. You want to be free to roam from room to room, from home to the office and back without the hassle of being tethered by cable to fixed access points.

As a niche product, wireless networking vendors got by without worrying too much about products from different vendors working together but that time passed a while back and there has been a flurry of activity over the past few years with much of it happening in 1998.

A representative selection of working groups and standards committees is shown below.

Proxim

Proxim appears on most of them. Its technology is the favoured solution of the Wireless LAN Interoperability Forum and the basis of HomeRF. Proxim's position becomes more understandable when you discover that

Proxim is the world's leading wireless LAN vendor, according to International Data Corporation.

IEEE 802.11

This is the only IEEE-ratified wireless networking standard. Ratified in 1997, it covers diffuse infra-red and spread spectrum radio. Infra-red is limited in range, by fixed objects such as walls and by low data rates. Spread spectrum radio spreads the signal across a band of frequencies, making it difficult to intercept, jam, or decode.

There are two types of spread spectrum radio: direct sequence (DSSS) and frequency hopped (FHSS). Both operate in the unlicensed 2.4GHz industrial, scientific, and medical band which is available worldwide with some restrictions in France and Spain. Currently, the technology supports 1Mbps and 2Mbps data rates. Work is

under way on higher speeds in the 2.4GHz and 5GHz bands.

The Wireless LAN Interoperability Forum

Although IEEE 802.11 is a ratified standard for multivendor wireless LAN interoperability, the standard lacks a precise definition of how roaming users move from one vendor's access point to another. The OpenAir standard is the work of the WLI Forum which was set up to address interoperability of FHSS radio products. OpenAir is based on Proxim's FHSS technology largely because Proxim is the single largest vendor of wireless LAN equipment to OEMS and end-users.

The HomeRF Working Group

The HomeRF Working Group spans the gamut of interests from the PC industry to consumer electronics and wireless communications. Companies include Compaq, HP, IBM, Intel, Microsoft, Ericsson, Motorola, Philips and Proxim. All are involved in

defining the Shared Wireless Access Protocol (SWAP) which aims to provide seamless multivendor wireless networking for home users.

SWAP draws together both DECT (Digital Enhanced Cordless Telephones) and the IEEE 802.11 wireless standard in order to define a common wireless interface for voice and data networking. SWAP 1.0 was released last January and products are expected by the end of this year. SWAP uses frequency hopping spread spectrum radio in the 2.4GHz band, and promises rates of 1Mbps and 2Mbps.

Although the title of the working group says 'Home', it seems inevitable that the technology will spill over to small-office users, too. Home users and small offices share the aims of the HomeRF working group: to enable shared access to the internet from any capable device, to share files and peripherals, to control electrical systems such as security alarms, and to manage phones and faxes.

Bluetooth

Bluetooth is short range radio technology from Intel, IBM, Ericsson, Toshiba and Nokia. It has since been adopted by Psion. It is largely designed to replace cables between mobile phones, PCs, handheld devices and peripherals. Bluetooth uses FHSS radio with a combined rate of 1Mbps, either 0.7Mbps one way with a slow back channel or under 0.5Mbps duplex.

With a target range of 10cm to 10m, Bluetooth is aimed primarily at applications which link mobile phones and PCs or mobile computers — for example, remote networking via mobile phones. As with HomeRF, Bluetooth will bridge to existing networks and enable *ad hoc* private networks such as multiplayer games with Bluetooth games consoles.

Bluetooth
technology

A universal technology
for mobile connectivity